

Memorandum

To: Joe Feriancek, PE

From: Andrea Blanchette, PE
Tom Wood
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Date: March 4, 2020

Re: Pavement Coring Forensic Report
City of Ramsey
WSB Project No. 015656-000

Introduction

WSB is pleased to submit this pavement forensics report detailing the results of the pavement coring which was completed on March 2, 2020 in the City of Ramsey. The various characteristics of the pavement cores were summarized to provide information to the City to assist in determining the appropriate pavement maintenance or rehabilitation method for the roadways.

A total of 8 (6 of which were taken in a patched area) pavement cores were obtained in the Business Park 95 Project Area and a total of 12 cores were obtained in the Regency Pond Project Area. The locations of the pavement cores are summarized in **Figure 1** and **Figure 2**. A summary of the pavement depths and conditions for the streets are shown in **Table 1**. Pictures of the cores obtained can be found in the **Appendix**.

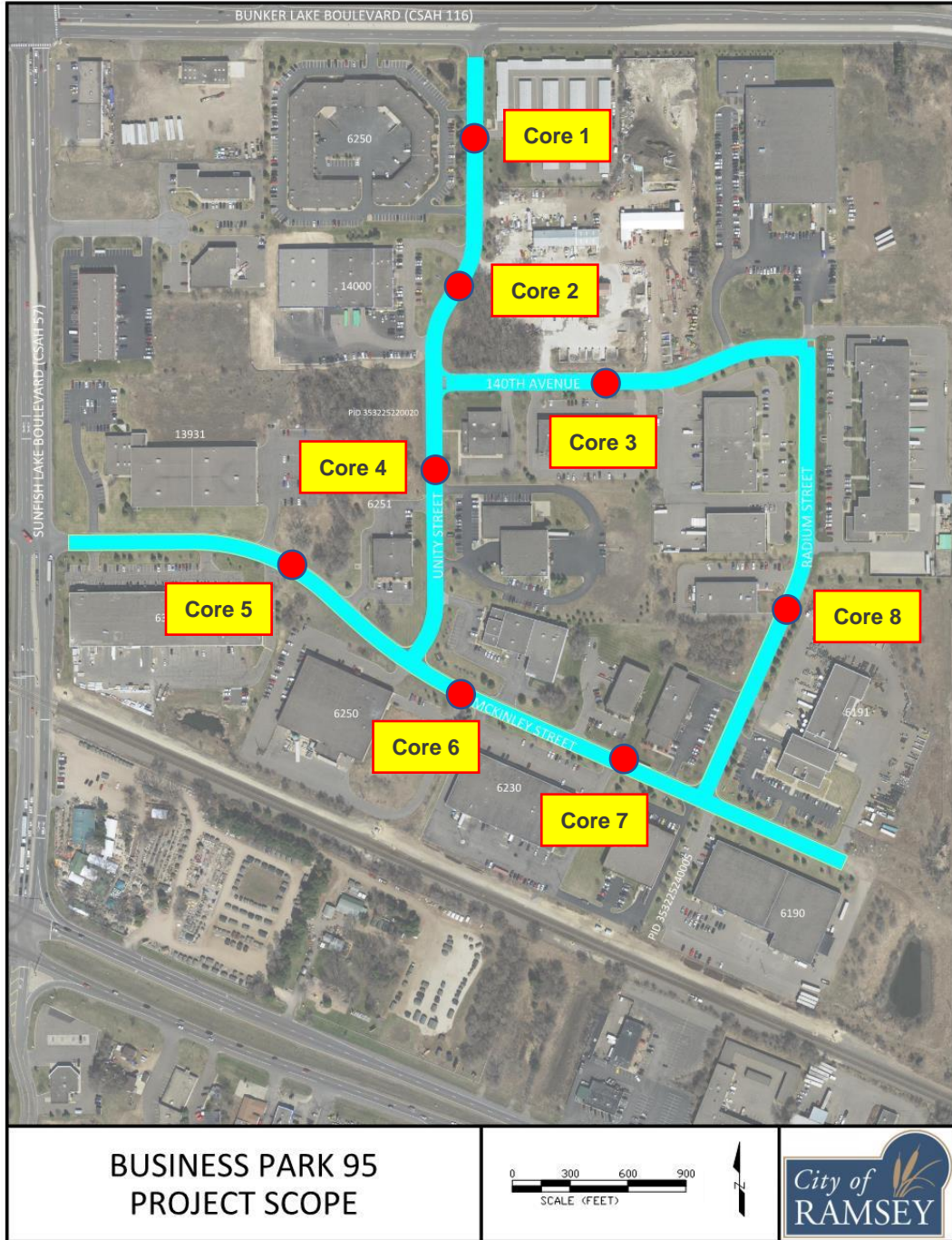


Figure 1. Pavement core locations in Business Park 95 Project Area

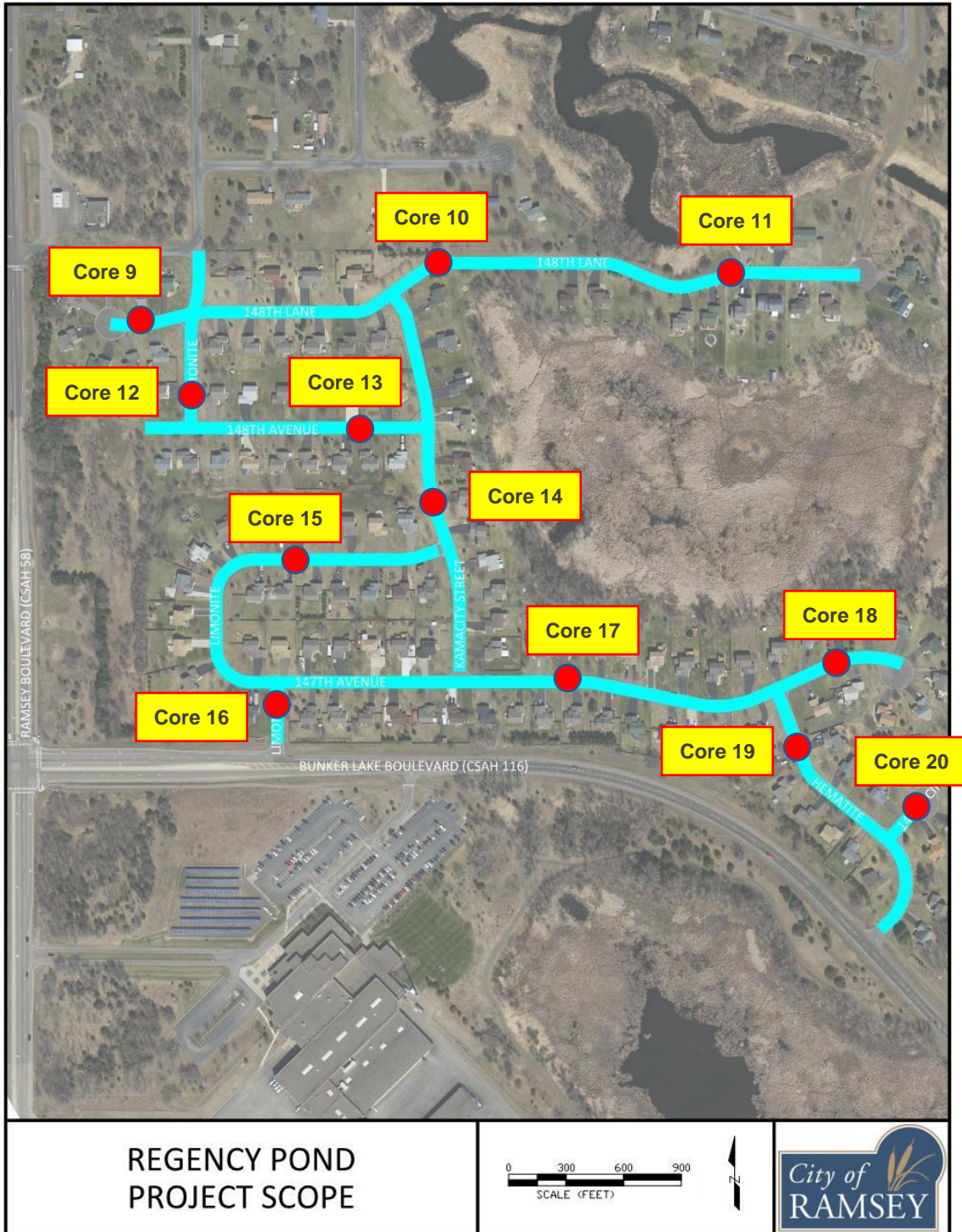


Figure 2. Regency Pond Project Area

Table 1. Pavement core location and information

Core ID	Location	Bit Depth (inches)	Agg. Depth ¹ (inches)	Notes	Recommended Maintenance
1	Unity Street	6	6	The top lift of pavement was 1.25 inches. This layer was starting to show signs of deterioration losing fines and binder. The rest of the core was bonded and showing minimal signs of aging.	2 Inch Mill and Overlay
2	Unity Street (On a Patched Area)	7	8	The top lift of pavement was 2 inches. This layer was starting to show signs of deterioration losing fines and binder. The patch was not bonded to the pavement section and was completely delaminated. The rest of the core was in decent shape.	2.5 Inch Mill and Overlay
3	140 th Avenue (On a Patched Area)	5	5.5	The top lift of pavement was 2.5 inches. The core completely fell apart upon removal from the hole.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
4	Unity Street (On a Patched Area)	8	5.5	The top lift of pavement was 2 inches. The top 4 inches of pavement broke off from the rest of the core and showed parts were delaminated with no bond. Below the top 4 inches, the core completely fell apart.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
5	McKinley Street	6.5	6.5	The top lift of pavement was 1.75 inches. The core was in good shape, all the layers were bonded together well.	2 Inch Mill and Overlay

6	McKinley Street (On a Patched Area)	6	9.5	The top 3 inches of pavement was completely raveled and broke apart upon removal from the core hole. The bottom 3 inches was bonded together. Because the top 3 inches crumbled the lift thickness of the wear course could not be determined.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
7	McKinley Street (On a Patched Area)	4.75	9	This core was in very poor condition with delamination of the patch as well as a severe loss of fines and binder throughout.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
8	Radium Street (On a Patched Area)	4	5	This core was in very poor condition with delamination of the patch as well as a severe loss of fines and binder throughout. The core broke apart upon removal from the core hole.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
9	148 th Lane	3	6	The core was in fair condition. The layers were bonded together. The core was starting to show signs of aging losing fines and binder.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
10	148 th Lane	3	4	This core was in very poor condition and broke apart upon removal from the core hole.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
11	148 th Lane	2.5	5	The core was in fair to poor condition. The layers were bonded together. The core was starting to show signs of aging losing fines and binder.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
12	Limonite	2	4.5	The core was in fair condition. This was a very thin lift of	Full Depth Reclamation, Full Bituminous Removal

				pavement and was starting to show signs of aging, losing fines and binder.	and Replacement or Reconstruction
13	148 th Avenue	2	6	This core was in very poor condition and broke apart upon removal from the core hole.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
14	Kamacity Street	2.75	3.75	The core was in fair to poor condition. The layers were bonded together. The core was starting to show signs of aging losing fines and binder.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
15	Limonite	2	7	This core was in very poor condition and broke apart upon removal from the core hole.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
16	Limonite	2	5	The core was in fair condition. This was a very thin lift of pavement.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
17	147 th Avenue	3	4	The core was in fair condition. The layers were bonded together. The core was starting to show signs of aging losing fines and binder.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
18	147 th Avenue	4	5	This core was in very poor condition and broke apart upon removal from the core hole.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
19	Hematite	3.75	4.75	The core was in fair condition. The layers were bonded together. The core was starting to show signs of aging losing fines and binder.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
20	146 th Circle	2.5	11	The core was in good to fair condition. This was a thin lift of pavement.	Full Depth Reclamation, Full Bituminous Removal and Replacement or Reconstruction
¹ Subgrade material was observed to be sand material on Cores 1 through 10 and sand/gravel on Cores 11 through 20.					

Summary of Findings

Business Park 95

The cores taken along the roadways in this project area varied in bituminous thickness from 4 to 8 inches. Cores 1, 2 and 5 were in good condition with the layers bonded together well and the bituminous condition not yet showing signs of aging. However, the remainder of the pavements in this project area were either showing severe signs of aging below the pavement surface, including crumbling upon removal from the core hole. Because of this, it is recommended to perform either a full depth reclamation, full depth bituminous removal and replacement or full reconstruction in this project area. There is not enough sound material in these locations to do a partial depth mill and overlay.

Regency Pond

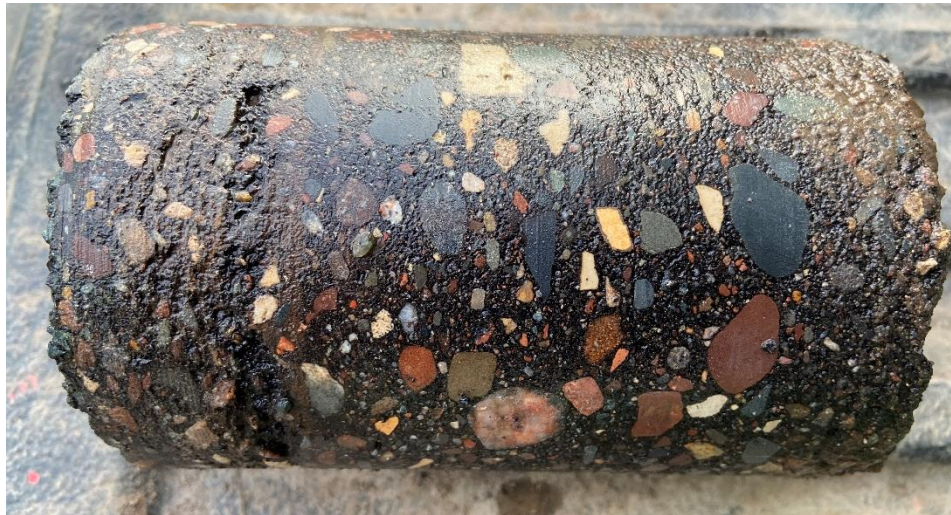
The cores taken along the roadways in this project area varied in bituminous thickness from 2 to 4 inches. In general, the bituminous was either very thin, or shown to be in very poor condition. Because of this, it is recommended to perform either a full depth reclamation, full depth bituminous removal and replacement or full reconstruction in this project area. There is not enough sound material in these locations to do a partial depth mill and overlay.

Appendix

City of Ramsey

Coring Pictures

Core 1 (Unity Street)



Core 2 (Unity Street on Patched Area)



Core 3 (140th Avenue on a Patched Area)





Core 4 (Unity Street on Patched Area)



Core 5 (McKinley Street)



Core 6 (McKinley Street on a Patched Area)



Core 7 (McKinley Street on a Patched Area)



Core 8 (Radium Street on a Patched Area)



Core 9 (148th Lane)



Core 10 (148th Lane)



Core 11 (148th Lane)



Core 12 (Limonite)



Core 13 (148th Avenue)



Core 14 (Kamacity Street)



Core 15 (Limonite)



Core 16 (Limonite)



Core 17 (147th Avenue)



Core 18 (147th Avenue)



Core 19 (Hematite)



Core 20 (146th Circle)

