

Report to:



## **Victoria Avenue Bridge – Steel Inspection And Assessment Report**

Document No. 0619920300-REP-S0004-02



### **Third Party Disclaimer**

This document has been prepared in response to a specific request for service from the client to whom it is addressed. The content of this document is not intended for the use of, nor is it intended to be relied upon, by any person, firm, or corporation, other than the client of Wardrop Engineering Inc. to whom it is addressed. Wardrop Engineering Inc. denies any liability whatsoever to other parties, who may obtain access to this document, for damages or injury suffered by such third parties arising from use of this document by them, without the express prior written authority of Wardrop Engineering Inc. and its client who has commissioned this document.

### **Confidential**

This document is for the confidential use of the addressee only. Any retention, reproduction, distribution or disclosure to parties other than the addressee is prohibited without the express written authorization of Wardrop Engineering Inc.

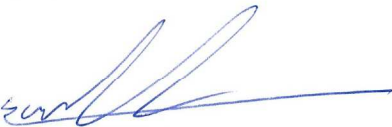
Report to:

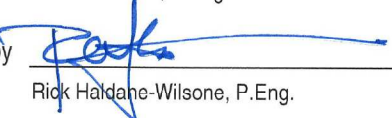


CITY OF SASKATOON

# VICTORIA AVENUE BRIDGE DETAILED PIER INSPECTION

FEBRUARY 2006

Prepared by  Date Feb. 10 / 06  
Emile Shehata, P.Eng.

Reviewed by  Date Feb 10 / 06  
Rick Haldane-Wilson, P.Eng.

**WARDROP**

1400-410 22nd Street East, Saskatoon, Saskatchewan S7K 5T6  
Phone: 306-244-4888 Fax: 306-664-7074 E-mail: saskatoon@wardrop.com

## REVISION HISTORY

---

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION

# TABLE OF CONTENTS

---

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>CONDITION ASSESSMENT .....</b>	<b>2</b>
2.1	BACKGROUND .....	2
2.2	VISUAL INSPECTION .....	3
2.2.1	SPAN 1 - UPSTREAM TRUSS .....	3
2.2.2	SPAN 1 - DOWNSTREAM TRUSS .....	4
2.2.3	SPAN 2 - UPSTREAM TRUSS .....	4
2.2.4	SPAN 2 - DOWNSTREAM TRUSS .....	5
2.2.5	OTHER TRUSS SPANS.....	5
2.2.6	SECONDARY STEEL MEMBERS.....	5
2.2.7	TIMBER DECK.....	5
<b>3.0</b>	<b>STRUCTURAL RATING.....</b>	<b>6</b>
3.1	RATING .....	7
<b>4.0</b>	<b>REHABILITATION OPTIONS .....</b>	<b>10</b>
4.1	OPTION 1 - 5 YEAR INTERIM REHABILITATION (MS50).....	10
4.2	OPTION 2 - 10 YEAR INTERIM REHABILITATION (MS50).....	11
4.3	OPTION 3 - 20 YEAR INTERIM REHABILITATION (MS50).....	12
4.4	OPTION 4 – MS50 – 50 YEAR LIFE EXTENSION .....	12
4.5	OPTION 5 – MS200 – 50 YEAR LIFE EXTENSION .....	13
4.6	OPTION 6 – DEMOLITION.....	14
4.7	LIFE CYCLE COST ANALYSIS .....	14
<b>5.0</b>	<b>CONCLUSIONS .....</b>	<b>15</b>
APPENDIX A	BRIDGE INSPECTION PHOTOS	
APPENDIX B	BRIDGE RATING CALCULATIONS	
APPENDIX C	CONCEPTUAL DESIGN DRAWINGS	
APPENDIX D	COST ESTIMATES AND LIFE CYCLE COST ANALYSIS	

## 1.0 INTRODUCTION

---

Wardrop Engineering was retained by the City of Saskatoon to undertake a detailed visual inspection and condition assessment of the steel structure of Span 1 of the 100 year old Victoria Avenue Bridge. The purpose of this investigation was to provide a second opinion of the assessment of the Victoria Avenue Bridge superstructure that was prepared by Stantec Consulting in the fall of 2005. The Stantec Inspection Report (2005) has identified several deterioration zones within the truss members of the bridge Spans 1 and 2. The report also included a load rating for the bridge subject to a MS50 truck and lane loading.

The inspection procedure included visual inspection and thickness measurements to quantify the deterioration of the truss members and connections for Span 1. We also performed detailed visual inspection of the accessible portions of the Truss in Span 2, in addition to a visual inspection of the other spans of the bridge.

This report includes the following:

- Documentation of the observed conditions along with photos for all inspected truss spans.
- A load rating evaluation of the Victoria Avenue Bridge superstructure in accordance with the CHBDC for the MS50 and MS200 design vehicles.
- Two rehabilitation options to extend the service life of the bridge for 50 years.
- At the City's request we have also included 5, 10, and 20 year interim rehabilitation options.
- Detailed cost estimates for the rehabilitation options and Life Cycle Cost Analysis (LCCA) for the two 50 year rehabilitation options are provided to identify the most cost effective long-term solution.