



## Structural Steel Maintenance and Rehabilitation Methods of Current Canadian Infrastructure

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S.F. Stiemer, born 1947, received his aeronautical engineering degree from the Univ. of Stuttgart, worked there and at Univ. of California, Berkeley, and at UBC in Canada. His academic focus is in structural steel design, reliability & risk, adaptive structures, and corrosion protection.

### Summary

Engineers choose steel based on its durability, ease of maintenance, proven lifecycle performance and versatility in highways and infrastructure applications. This paper will report on various types and sizes of public infrastructure in Canada with an emphasis on bridges. The focus will be on the maintenance and rehabilitation of steel bridges. Public infrastructure in Canada that has undergone maintenance and rehabilitation will be identified. Projects include the Lion's Gate Bridge in Vancouver, BC, and the MacKay and MacDonald Bridges in Halifax, Nova Scotia. Canadian Public Works departments and others in charge of handling maintenance have been the major source of information in this investigation. Also included in the scope of this paper is how infrastructure is assessed in terms of the extent to which maintenance is needed.

Maintenance can take either the form of preventive or reactive maintenance. Preventive maintenance practices are proactive actions, such as inspections and servicing. Reactive maintenance takes place after damage has occurred to repair or replace deteriorated components. Regular maintenance includes yearly activities such as cleaning out expansion joints in bridges, patching holes in the asphalt and clearing curbs of sand and salt accumulated from winter ice and snow control. The paper will give a comprehensive overview of the state-of-the-art methods and practice of maintenance and rehabilitation for bridges in Canada.

**Keywords:** steel bridges, corrosion protection, maintenance, cost minimization, case studies, policies

### 1. Introduction

Steel as construction material for bridges excels based on its durability, versatility, ease of maintenance, proven lifecycle performance and wide range of applications for highways and infrastructure. The focus of this paper will be on the maintenance and rehabilitation of steel infrastructure in Canada.

Rehabilitation is generally completed within 25 years after construction and could involve replacement of girders, deck, handrails or curbs. Rehabilitation can restore a bridge to near "new" condition [1]. Maintenance can be either preventive or reactive. Regular maintenance includes yearly activities such as cleaning out expansion joints in bridges, patching holes in the asphalt and clearing curbs of sand and salt accumulated from winter ice and snow control.

### 2. Canadian Policies and Methods

Canada has 13 provinces and territories: Alberta, British Columbia, Manitoba, New Brunswick,