

Conceptual Design of Salmon River Replacement Bridge

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Abstract

Replacing an existing narrow two-lane truss bridge constructed in 1954 with a wider modern day girder bridge while keeping the existing roadway alignment and maintaining two lanes of traffic throughout the construction period presents some interesting challenges. The Salmon River Bridge is a 180' (54.9 m) long single span steel Pratt truss structure located approximately 27 km north of the City of Prince George on Highway 97. McElhanney reviewed a number of conceptual bridge replacement designs including single span and multi-span configurations utilizing steel and/or concrete structures and reviewed existing, upstream and downstream road alignments. After considering environmental impacts, constructability, detour requirements and the need for under bridge walkways it was decided to design and construct a new 66.5 m long single span bridge on the existing roadway alignment utilizing steel girders and a concrete to-grade deck.

Keywords: replacement; bridge; I-girders; steel; concrete; deck; piles; abutments; detour

1 Introduction

The existing Salmon River Bridge is located approximately 27 km north of the City of Prince George on Highway 97 (see Figure 1.1). Highway 97 supports important resource industries such as mining, forestry and Liquefied Natural Gas (LNG) development in the North East section of BC. The bridge replacement project is part of the Ministry's economic expansion of the Highway 97 corridor to connect the Lower Mainland (Greater Vancouver) and Interior regions with the Peace Region and the Alaska Highway. The bridge was found to be a valid candidate for replacement due to its age, current condition and overall functionality with narrow roadway width and 5.4 m roadway clearance to end portal of through truss.



Figure 1.1: Bridge location key plan

McElhanney Consulting Services Ltd. (McElhanney) was retained by the BC Ministry of Transportation and Infrastructure (Ministry) to provide professional services for the conceptual and detailed design of a replacement bridge structure for Salmon River Bridge No. 0253.