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Rehabilitation and Superstructure Replacement of the Miles Canyon Timber Suspension Bridge

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Abstract

The Miles Canyon suspension bridge is a 40 m long historic wooden suspension pedestrian bridge across the Yukon River near Whitehorse, Yukon, Canada. The bridge is owned and maintained by the Government of Yukon (GY). The bridge forms an important link in the local trail system and is important for tourism access to some of the historic sites of the Klondike Gold Rush. Non-destructive testing in winter 2015 revealed advanced decay in many members, necessitating full superstructure replacement. A temporary rehabilitation was performed to allow the bridge to temporarily reopen for the summer 2016 tourist season, with a full superstructure replacement in fall 2016. Replacement timber members were carefully selected, detailed, and prefabricated, giving the rehabilitated structure an extended lease on life with proper upkeep and maintenance. Construction of both phases of the work were completed on time and on budget.

Keywords: pedestrian bridge; timber; wood; rehabilitation; durability; suspension; prefabrication

1 Introduction

The historic Miles Canyon suspension bridge is a 40 m long wooden suspension bridge across the Yukon River near Whitehorse, Yukon, Canada. It was originally constructed in 1922 as a tourist attraction across the 50-foot-high basaltic walls of Miles Canyon. The bridge is owned and maintained by the Yukon government. It is a fixture of life in Whitehorse, as it forms an important link in the local trail system, is a popular tourist attraction, and provides access to some of the historic sites of the Klondike Gold Rush. The bridge is accessed from non-motorized multi-use trails and by a short walk from a parking lot on the west side. It is used year-round for tourism and recreation.

1.1 Configuration

The Miles Canyon suspension bridge is supported by two steel main cables. The cables are supported by a timber-framed tower on each bank and are anchored to bedrock at each end. The main suspension cables support vertical hanger cables and timber cross-bearers at a 1.8 m spacing. These in turn support longitudinal timber stringers and a transverse timber deck. Four lateral cables anchored from midspan to each bank provide resistance to wind loads. Available records indicated that the bridge superstructure was last rebuilt in the later 1970s and the abutment towers and foundations were rebuilt in 2010.

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