

Conceptual Design, Detailed Design, and Construction of the Terwillegar Park Stressed Ribbon Footbridge

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Abstract

In January 2013, the City of Edmonton called for proposals for a new 300 m footbridge across the North Saskatchewan River in Edmonton, Alberta, Canada. Consultants were challenged to develop concepts that were innovative, fit the context of the deep natural river valley, and meet strict budgetary and schedule requirements. In October 2016, the longest and first multi-span stressed ribbon bridge in Canada was opened to the public. The Terwillegar Park Footbridge was designed by Stantec Consulting Ltd for the City of Edmonton and forms a key link in the river valley park system in that city. Stressed ribbon bridges can be described as precast concrete structures that are erected segmentally on cables and post-tensioned to achieve a continuous, slender, prestressed concrete structure. In this paper, the conceptual and preliminary design process of the Terwillegar Park Footbridge is described and challenges encountered in the design and construction of this elegant and innovative structure are shared.

Keywords: stressed ribbon; footbridge; precast; concrete; post-tensioned; segmental; cable; ground anchors

1 Introduction

The North Saskatchewan River Valley, located in Edmonton, AB, comprises over 20 major parks and attractions and forms one of the largest expanse of urban parkland in North America [1]. The multi-use trail system that follows the 48 km river valley winding through the city is extensive and has required the construction of several pedestrian bridges spanning the river.

As part of the current multi-use trail system expansion, the City of Edmonton called for proposals in January 2013 for a new footbridge

crossing the North Saskatchewan River that would be approximately 300 m in length. The project would include construction of approximately 3.5 km of multi-use trails to connect to the park system on both sides of the river.

The city challenged consultants to develop concepts that were innovative, fit the context of the deep natural river valley, and met strict budget and schedule requirements. The bridge and trails project also had to satisfy environmental, historical, and archaeological requirements, and follow a comprehensive public consultation process.