

Construction of the Terwillegar Park Stressed-Ribbon Footbridge

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Abstract

The recently completed Terwillegar Park Footbridge is a new stressed ribbon bridge located in Edmonton's river valley. The bridge is 262 m in length and is one of the longest stress-ribbon bridges in the world. This bridge type comprises a thin deck, supported on highly stressed bearing strands, and post-tensioned to achieve the necessary stiffness and desired geometric shape.

Associated Engineering, working as an erection engineer for Graham Infrastructure developed methodology to construct this bridge, described in this paper. One innovative accelerated construction method used was the creation of the 'messenger' loop system that facilitated bearing strand and precast panel installation. Furthermore, the construction erection team was required to provide geometric set-out during construction and involved modelling, monitoring and reporting of the bridge during construction.

Keywords: pre-stressing, post-tensioning, cable structure, stressed ribbon, accelerated construction.

1 Introduction

The term stress-ribbon bridge refers to tension structures, where the suspension cables are embedded directly in the deck of the structure. Primarily used in footbridges, in this type of structure, pedestrians walk directly on the concrete deck, which follows the shape of a catenary arc between the support [1].

Stressed Ribbon bridges are a relative modern cable supported structure and at the time of writing, there are approximately 60 of these structures worldwide [2]. The development of this bridge type can be partially attributed to significant improvements in the development of prestressed concrete technology since the 1950s [3].



Figure 1. The Terwillegar Park Footbridge

2 Project & Structure Specifics

2.1 Project Specifics

The Terwillegar park footbridge is 262 metres long and provides a direct link across the North Saskatchewan River between Terwillegar Park and Oleskiw River Valley Park.