Tawatinâ Bridge - An Extradosed Rail and Pedestrian Bridge

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1 Abstract

Tawatinâ Bridge is a new 260m long extradosed light rail and pedestrian bridge over the North Saskatchewan River. The hybrid bridge consists of a concrete box girder which supports two tracks of light rail and a lightweight steel pedestrian bridge which is suspended below the box. The bridge is being constructed cast-in-situ balanced cantilever using two moveable form travelers. This paper explains the design and construction challenges and solutions adopted in the creation of this landmark structure.

Keywords: hybrid, balanced cantilever, cable stay, extradosed, cast in situ, post tensioning, box girder, bridges, Canada, light rail

2 Introduction

Tawatinâ Bridge forms part of the 27km, $1.8bn Valley Line LRT design-build project in Edmonton, Alberta, Canada. The bridge has been designed by Arup and built by American Bridge for TransEd Partners (Bechtel/Ellis Don).

The cross section of the bridge is shown adjacent in Figure 1. Two planes of inclined cables support a prestressed concrete box girder which in turn supports bar hangers for the orthotropic steel pedestrian bridge below it. The box girder supports two direct fixation tracks and the steel bridge carries pedestrians on timber decking on the outsides of the hangers and cyclists on asphalt within. Figure 2 is a render which illustrates the slender aesthetics of the final bridge.
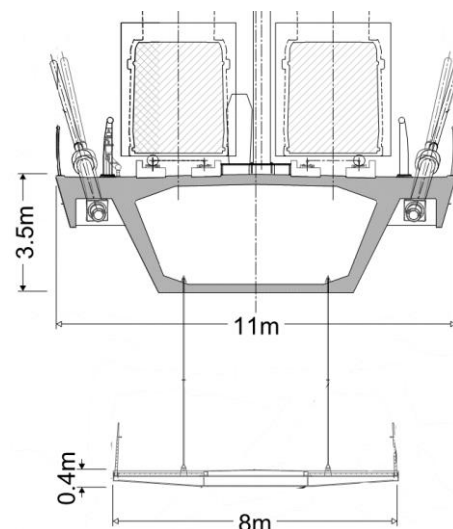

Figure 1 – Hybrid cross section with rail on top and pedestrians/cyclists below