



Addressing Design and Construction Challenges for a Complex Elevated Interchange over the Sea

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Abstract

As part of the strategic road network in Hong Kong, an express link will connect East Kowloon and the new town of Tseung Kwan O. Part of this link includes an elevated interchange over the sea with seven post-tensioned bridges. The series of balanced cantilever bridges within this marine interchange run in a spaghetti junction manner around the main line viaduct, which comprises two parallel bridges connected at each pier with a cast in-situ diaphragm.

This paper presents the project's unprecedented design challenges, along with the methods used to construct the complex viaducts whilst ensuring a safe construction environment.

Keywords: segmental bridge construction; geometry control.

1 Introduction

Bridges are typically straight in plan or may introduce a gentle curvature. At interchanges the bridges can however become curved with which the design and construction becomes more challenging. The Tseung Kwan O (TKO) Interchange in Hong Kong is a tight interchange with the radius of the link roads down to 40m. When this is added to the interchange being constructed over the sea, the level of complexity reaches a new level for both the designer and contractor requiring innovative and well-considered solutions that consider both the geometry and the environmental conditions.

The project is part of a new East-West highway across Kowloon (Route 6) which provides both

relief from traffic congestion and linkage to the expanding new town of Tseung Kwan O. Figure 1 shows this section of Route 6 and the location of the interchange and its location relative to Tseung Kwan O.

The client for the Project is Civil Engineering and Development Department with AECOM acting as Engineer. Aurecon supported contractor Chun Wo Construction with its tender, and subsequently after award of the Project to Chun Wo, developed the alternative design of the viaduct while also providing construction assistance including geometry control and construction engineering services.