



Challenges in the Design and Construction of the Queensferry Crossing

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Abstract

The Queensferry Crossing is Scotland's largest infrastructure project in a generation. It will replace the existing Forth Road Bridge which has suffered deterioration to many components in recent years. Predictions of cable deterioration to the existing suspension bridge indicated that weight restrictions were likely towards the end of this decade, and the loss of such a vital link was considered intolerable.

This paper explains the background to the project and describes key aspects and challenges in the design of this unique bridge, from the designer's perspective, with a focus in particular on the challenges in the design and erection of the bridge's superstructure which is presently under construction.

Keywords: Cable Stayed, Design, Construction, Methods, Inspection, Maintenance, SHMS.,

1.0 Introduction

Scotland's largest infrastructure project in a generation, the £790m Queensferry Crossing, which will span across the Forth Estuary, is entering its final year of construction and its form is beginning to emerge in a most dramatic way.

The new Crossing and its approach roads are being constructed under a Design and Build Contract for the Employer, Transport Scotland. The Contractor, Forth Crossing Bridge Constructors (FCBC) is a Joint Venture of Hochtief Construction AG, Dragados, American Bridge International and Morrison Construction. Ramboll is the lead partner in the Design Joint Venture

carrying out the detailed design of the project, working with Sweco and Leonhardt, Andra und Partner.

The crossing will be a cable-stayed bridge, with an overall length of 2.7 kilometres. At its centre is a three masted cable stayed structure with a unique arrangement of overlapping stay cables. It will be the third bridge across the Forth at Queensferry, alongside the Forth Road Bridge, a 1006m span suspension bridge, completed in 1964, and the Forth Bridge, now designated as a World Heritage Site, which was completed in 1890.

The bridge is due to be opened to traffic by the end of 2016.