



Mersey Gateway Bridge (UK) - Design for Construction

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Abstract

The Mersey Gateway Bridge is being procured under a design, build, finance and operate contract, one of the largest of its type in the UK. Key aspects of the design and construction are described. The crossing is 2.25km long and includes a 1km long three tower cable stayed bridge across the River Mersey estuary together with approach viaducts to the north and south. Main spans are 294m and 318m, approach viaduct spans are around 70m each. The deck features a single central plane of cables and a continuous single cell concrete box girder 4.6m deep with transverse post tensioned ribs at around 6m centers. Construction of the cable stayed bridge is based on the balanced cantilever principle and the approach viaducts are built using full span in-situ casting on a self-propelled moveable scaffold system.

Keywords: cable stayed bridge, post-tensioning; construction methods; moveable scaffold, marine foundations.

1 Introduction

The Mersey Gateway Bridge (MGB) is being procured under a design, build, finance and operate contract, one of the largest of its type in the UK. Key aspects of the design are described together with construction progress as at mid-2016.

The main feature of the project is a 1km long three tower cable stayed bridge across the River Mersey estuary, see *Figure 1*, together with approach viaducts to the north and south. Restrictions on foundation locations in the estuary limit options for anchor piers in the back spans of the cable stayed bridge and have resulted in the central tower being shorter than the two flanking

towers. Main spans are 294m and 318m. Monopylons are supported on direct foundations bearing on the underlying sandstone strata. The deck features a single central plane of cables and a continuous single cell concrete box girder 4.6m deep with transverse post tensioned ribs at around 6m centers. Construction is based on the balanced cantilever technique with 6m long segments cast in-situ.

The approach viaduct deck is structurally continuous with the cable supported bridge and of a similar form. Environmental restrictions have led to minimum span of around 70m with piers supported on piled foundations. A “moveable scaffold system” (MSS) is being used for cast in-situ construction of the deck with incremental