



## Design and Construction of the Mersey Gateway Bridge

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### Summary

Mersey Gateway Bridge is a 2.25km long major estuary crossing under construction in the UK. It is being built as part of a concession agreement to increase capacity across the upper Mersey Estuary. The bridge features a 1km long three tower cable stayed bridge.

**Keywords:** cable stays; cable stayed bridge, post-tensioning; external prestressing; balanced cantilever; moveable scaffold system, direct foundations, 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 and construction are described.

The main feature of the project is a 1km long three tower cable stayed bridge across the River Mersey estuary, Figure 1, together with approach viaducts to the north and south. Restrictions on foundation locations in the estuary have limited the options for providing 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. Mono-pylons 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 in-situ casting of 6m segments.

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 generally supported on piled foundations. A “moveable scaffold system” (MSS) is being used for cast in-situ construction of the deck with incremental installation of prestressing.