

## West Gate Bridge - Strengthening of the Concrete Viaducts

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### Summary

The 2.5km long West Gate Bridge comprises an eastern and western concrete approach viaduct, 871m and 670m respectively long either side of the 848 m long cable stayed steel box girder main span section. The key objective with the West Gate Bridge Strengthening Project was to increase the number of lanes in each carriageway from 4 to 5 to reduce traffic congestion on the M1 Freeway. This paper describes the elements used to strengthen the concrete viaducts including carbon fibre reinforcement and additional post-tensioning. An extensive system of temporary platforms was required for access to the outside of the box girder. Given the weight of these platforms and the limited capacity of the unstrengthened bridge, particular care was required with the staging of the works, traffic controls and platform movements.

**Keywords:** Bridges, carbon fibre, segmental construction; rehabilitation; post-tensioning; strengthening.

### 1. Introduction

The 2.5km long West Gate Bridge (WGB) spans the Yarra River in Melbourne, Victoria. The bridge is part of the M1 freeway and links Melbourne's CBD with the western suburbs. It comprises eastern and western concrete approach viaducts, 871m and 670m respectively long and an 848 m long cable stayed steel box girder main span section (ref Fig 1).

The typical viaduct span is 67m and the superstructure comprises a three-cell post-tensioned concrete box girder, originally constructed using span-by-span construction. Propped cantilevers at 3.7 m centres support the outer portions of the deck (ref Fig 2). Some strengthening works had been performed on the western viaduct in 2004.

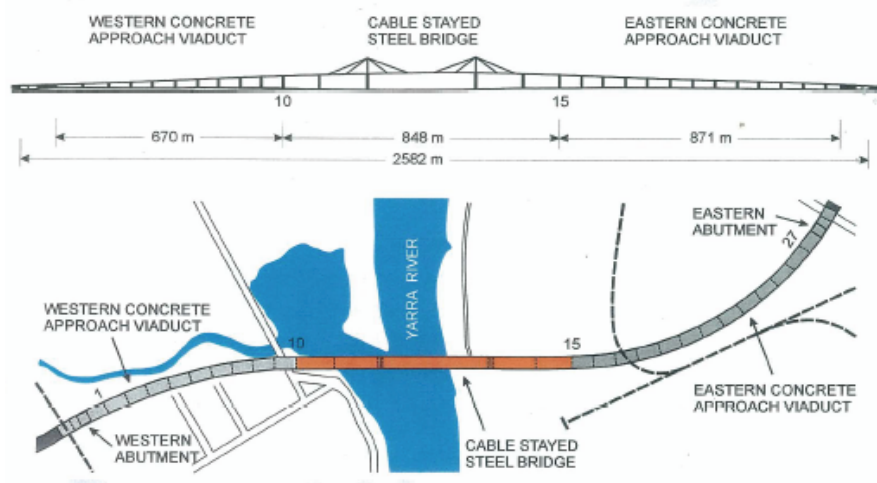


Fig. 1. General arrangement of the West Gate Bridge.