

West Gate Bridge: A Case Study on the Use of Carbon Fibre

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Summary

In recent years fibre reinforced polymer composites have gained acceptance as a means of retrofitting existing reinforced concrete civil infrastructure. A good example of this is the West Gate Bridge in Melbourne, Australia, the subject of this paper, which has recently been reinforced in the largest applications of carbon fibre bridge strengthening in the world.

Carbon fibre reinforced polymers (CFRP) were chosen as the preferred means of strengthening the WGB concrete viaducts because of their durability, ease of installation and ability to adhere to irregular geometries. Laboratory investigation of anchorage details showed it is possible to safely achieve much higher utilisations than those prescribed by commonly used standard guideline approaches. This paper discusses the laboratory investigations undertaken through to the implementation of the verified details on the bridge itself.

Key words: West Gate Bridge, CFRP, anchorage, concrete box girder, rehabilitation, application, strengthening.

1. Introduction

Increasing traffic loading and volume have resulted in additional pressures on our existing infrastructure. A good example of this is the West Gate Bridge (WGB) in Melbourne, Australia (refer Figure 1), which is one of the largest CFRP strengthening projects ever completed in the world.



Figure 1 - View of the West Gate Bridge