



M48 Severn Crossing, UK. Wye Bridge / Beachley Viaduct Rocker Replacement

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Summary

The original design of the Wye Bridge and Beachley Viaduct accommodated thermal movements with an expansion joint – located at approximately the mid-point of the structure. This paper describes the development and execution of a scheme to address the material wear at the bearing surfaces and to improve the ride-quality over the joint by replacing the two rocker arm units which link the box girders either side of the expansion joint.

Keywords: Box girder Bridges, rocker bearings, expansion joints, steel bridge strengthening

1. Introduction

The M48 Severn Crossing carries the M48 Motorway, as well as pedestrian and cycle routes, over both the Severn Estuary and the mouth of the River Wye and connects England and Wales. The crossing, which opened in 1966, is made up of a number of innovative steel box girder structures, particularly the Severn Suspension Bridge, the cable stayed Wye Bridge and the Beachley Viaduct which connects the two bridge structures, see Figure 1a. The M48 Severn Crossing and the M4 Second Severn Crossing are operated and maintained by Severn River Crossing Plc (SRC) under a concession agreement with the UK Government.

Thermal movements of the Wye Bridge and Beachley Viaduct are catered for with an expansion joint, located at the approximate mid-point of the combined bridge and viaduct structure. As illustrated in Figure 1b, two pinned rocker arms provide shear force and torsional continuity to the box girders either side of the joint, whilst allowing thermal articulation. On account of increasingly poor ride quality over the joint on cold days experienced by fast-moving vehicles, in addition to increasing levels of corrosion and wear observed around the rocker arm pins, Flint & Neill were commissioned by SRC to devise a solution.

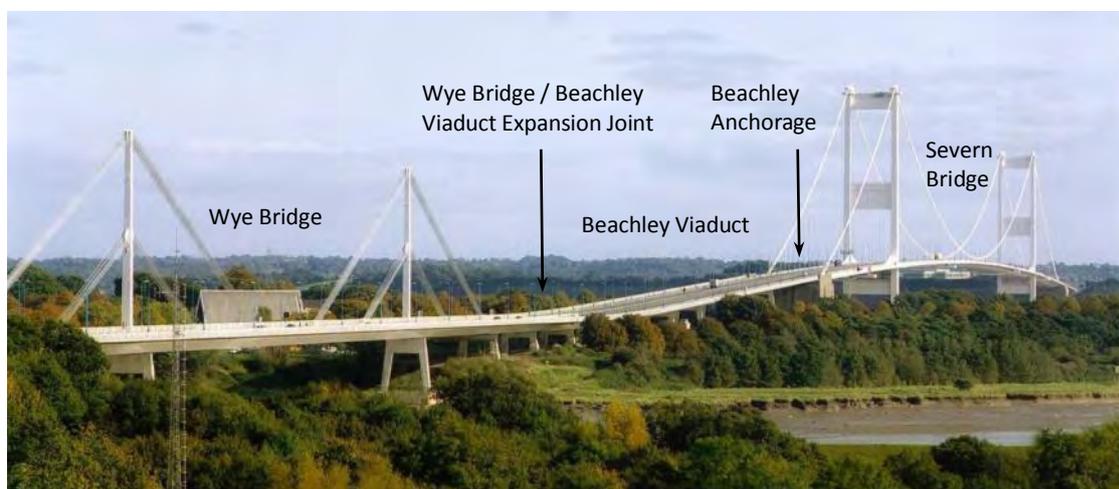


Fig. 1a: View of the M48 Severn Crossing showing expansion joint location