Construction of Humber Bridge A-Frame rocker bearing replacement

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Abstract

Bearings connecting the 1410 m main span deck box to the towers of the Humber were heavily worn. A challenging £4m (US$6.3m) replacement scheme including significant temporary works was implemented. All works to this landmark structure took place with the bridge open to traffic.

Keywords: Humber Bridge; bearings; replacement; strengthening; suspension bridge.

1 Introduction

Opened in 1981, the 1410 m suspended main span of the Humber Bridge, UK was the world's longest until 1997. At the towers, pairs of A-frame rocker bearings providing torsional stability to the main span deck box had become heavily worn. The Humber Bridge Board commissioned Arup to investigate [1], resulting in a challenging £4m (US$6.3m) replacement scheme [2], with C Spencer Ltd starting works in July 2013.

The main span pairs of A-frame rocker bearings at each tower experienced an estimated 4.5 km/year cumulative sliding displacement. The dead, traffic and dynamic wind loads carried by the A-frames were separated into new vertically orientated rocking pendels and a horizontally orientated wind shoe. See Figure 1 and Figure 2.

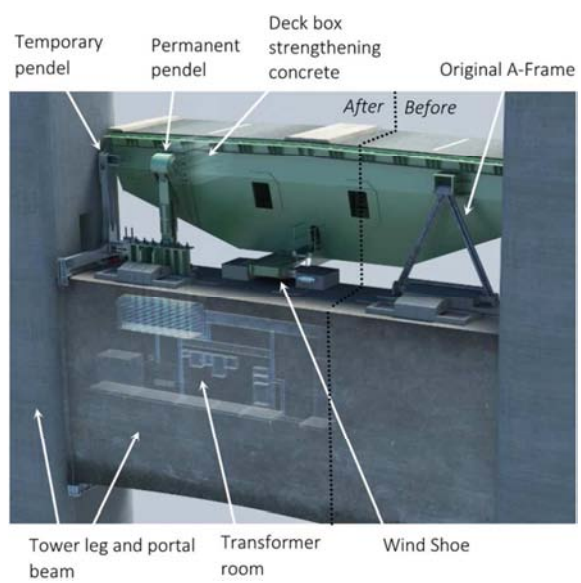

Figure 1. General arrangement looking onto main span deck box. For clarity, side span not shown.

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