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Yavuz Sultan Selim (3rd Bosphorus) Bridge-Inspection and Maintenance

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Abstract

The Yavuz Sultan Selim bridge, also known as the 3rd Bosphorus Bridge, was opened to road traffic in August 2016. The stiffened suspension bridge, with a main span of 1408m, overall length 2250m and width 59.4m, is believed to be the first of its type. It is situated in a seismic region and exposed to a severe wind climate. It has been designed and constructed to carry 8 lanes of road traffic and twin track heavy rail-all on a single deck.

The bridge has been equipped with a Structural Health Monitoring (SHM) system. The instrumentation allows the monitoring of bridge behaviour. The dehumidification of the towers, bridge deck and suspension cables is also monitored. The ambient weather conditions including wind velocity, humidity and seismic activity are recorded.

This paper gives an overview of the inspection and maintenance regime. It also describes the observed performance of the bridge against its predicted behaviour.

Keywords: suspension; cable stayed, inspection, maintenance, structural health monitoring, dehumidification, instrumentation

1 Introduction

The Yavuz Sultan Selim bridge (YSS), also known as the Third Bosphorus, is a stiffened suspension bridge. With a main span of 1408m, overall length 2250m and width 59.4m, it is believed to be the first of its type. It has been designed and constructed to carry 8 lanes of road traffic and twin track heavy rail, all on the same level. Figure 1. Bridge Elevation-European side (Schematic) and Figure 2. Steel Deck Cross Section (Schematic) depict the layout.

The bridge is situated in a seismic region and exposed to severe wind climate. It was opened to road traffic in August 2016.

To assist with its safe performance and long-term durability during its design life of 100 years, the YSS bridge will be subjected to a comprehensive inspection and maintenance regime and its behaviour monitored.

This paper describes the inspection and maintenance regime, monitoring equipment and bridge performance.