



Izmit Bay Suspension Bridge – Vibration control of Steel tower

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Summary

This paper presents the wind-induced vibration of the steel towers of IZMIT Bay Suspension Bridge in Turkey both at the in-service condition and during the construction, the necessity of vibration mitigation and the design of anti-vibration system.

Keywords: IZMIT Bay Bridge, Steel tower, Anti-vibration device, Wind-induced vibration

1. Introduction

The Izmit Bay Bridge, consisting of the North Approach Viaduct, the Suspension Bridge and the South Approach Viaduct, will carry the planned Gebze-Orhangazi-Bursa-Izmir motorway across the Sea of Matmara at the Bay of Izmit between the Diliskelesi peninsula on the north and the Hersek peninsula on the south in Turkey. The bridge construction has started in January 2013 and will be completed in early 2016.

The main bridge is arranged as a three span continuous suspension bridge having a total length of $566+1550+566=2682\text{m}$. The deck is a hexagonal closed steel box girder with a width of 30.1m and a depth of 4.75m and is carrying three lanes of highway traffic in each direction. The walkway for maintenance cars with a width of 2.9m is at both sides of the steel deck as similar to 1st and 2nd Bosphorus bridges. Each main cable consists of 110 nos. of prefabricated parallel wire strands each having 127 wires with a diameter of 5.91mm. The tower is 236.4m high steel structure due to the high seismic demands and short construction time. The tower consist of closed box section legs inclined by about 1:80 and two rectangular closed box cross beams in the middle and at the top. Inside of the tower is protected by a dehumidification system. The tower leg is divided into 22 blocks to meet the fabrication and the erection demands, and the blocks above EL+146m are further divided into 4 panels for the erection to keep weight of

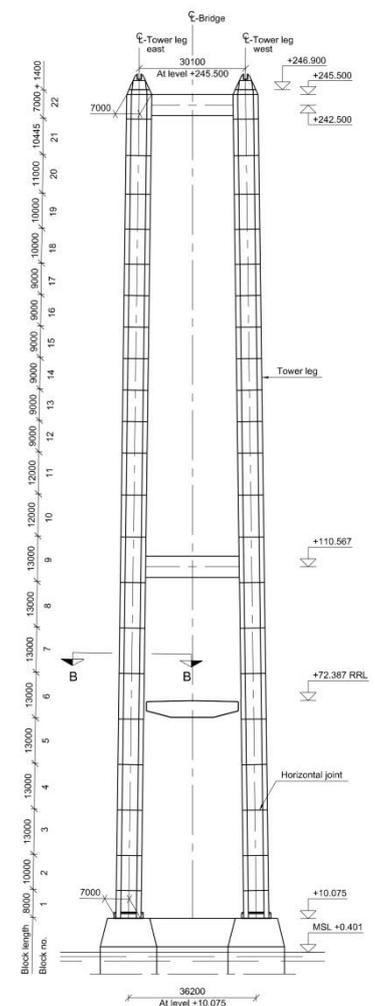
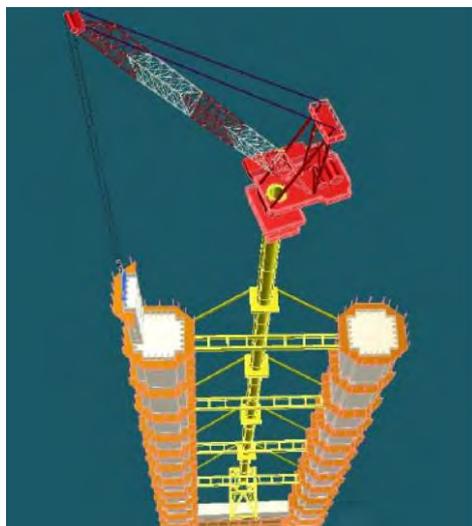


Figure 1 Tower: General arrangement