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## **Catwalk Design and Erection of the 1915 Çanakkale Bridge**

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### **ABSTRACT**

The 1915 Çanakkale Bridge has the longest main span of 2,023m in the world, and the total span length between anchorages reaches 4,163m. The bridge is located at the North-eastern end of the Çanakkale Strait in Türkiye which is one of navigation channels with the most heavy traffic and windy condition. The planning, design and erection of catwalk system as an aerial workspace for main cable erection raised various technical challenges against extreme loadings such as strong winds and earthquake. The specific behaviour of catwalk under lateral loads was taken in account to FE analysis model development and wind tunnel test supported to investigate the aerodynamic stability of catwalk system. Catwalk has the width of 4.5m, which supported by 12 spiral strand ropes with a diameter of 50mm and MBL of 2,100kN. Catwalk was divided at each tower top and storm system was not included. During construction of catwalk, suspender system ensured the minimum clearance of 70m from the sea level for marine traffic. After the completion of catwalk floor erection, to balance the horizontal forces on tower top during PPWS erection, the tower top had to be offset from their final position. The steel tower's flexibility was quite sufficient to the required pull back amount of approx. 1.7m in European tower and 2.6m in Asian tower

**Keywords:** Long span bridge, Suspension bridge, Catwalk, Geometry control, Wind tunnel test, PPWS.

### **1 INTRODUCTION**

This paper describes the design basis, structure design, wind tunnel test, erection work and geometry control of catwalk system for main cable erection of the 1915 Çanakkale Bridge, which is the longest suspension bridge having a main span of 2,023m and total span of 4,163m. The catwalk is parallel to the main cable with a distance of 1.5m. Catwalk has the width of 4.5m and it is supported by 12 spiral strand ropes with a diameter of 50mm and MBL of 2,100kN. There are 26 cross bridges at every 144m along the span, and tramway supports are located at every 72m. With checking the aerodynamic stability of catwalk, it was concluded that storm system is no need, which lead to secure vessel traffic on the strait and to expedite construction. Steel tower's top position was adjusted by pull back strands prior to main cable strand erection, which was designed as a part of catwalk system. General configuration and dimension of catwalk is shown in Figure 1.