The Messina Strait Bridge – Greatest Bridge Ever Built

Juhani VIROLA, Eur Ing-FEANI
Helsinki Finland
http://koti.kontu.la/jvirola/cv-jv.rtf

In 2006, the long projected Messina Strait Bridge seemed eventually to be commenced [1-2], but later in 2006 it was postponed [3]. However, according to recent information in 2008, this project seems again to be revived [4]. The following article is based on the information as it was in 2006.

A bridge or tunnel across the Messina Strait between mainland of Italy and island of Sicily has been under consideration during several decades. In 1950, a known American bridge engineer David B. Steinman suggested a suspension bridge for road and train traffic with a main span 5000 ft. (1524 m), in those times the longest bridge span in the world **[5]**. In 1969, an international design competition was arranged. In the early years of the 2000's, the project was forwarding and an international contract competition was arranged. In October 2005, a consortium led by Impregilo won the contract to build the bridge, at a cost of about EUR 4 milliard, and it was to prepare a final design for the concessionaire Stretto di Messina S.p.A. **[6]**.

According to the year 2006 plan, the main span of the Messina suspension bridge is enormous 3300 m, i.e. 66% longer than the current 1991 m world record main span of the Akashi-Kaikyo suspension bridge in Japan **[7]**. In the Messina Bridge, the main span and a 183 m long section of both side spans near towers are supported by hangers from overhead main cables, whereas the outer parts of side spans are supported by underneath piers. The steel towers are 383 m tall (Akashi towers 297 m). The overall width of the deck is 60,4 m, structural depth 4,7 m, and vertical clearance at mid-span 65 m. The deck consists of 3 longitudinal steel box girders, with 2 intermediate open spaces due to aerodynamics, and these 3 longitudinal girders are tied together with cross-beams at certain intervals.

The deck accommodates 2 road lanes and 1 service lane at both sides, each 3,75 m wide, and there is also 1 narrow service lane at both sides along outer cantilever portions. The railway section along the middle girder of the deck is composed of 2 railway tracks, and 2 independent lanes for service traffic and pedestrians. The traffic capacity is 6000 vehicles/h and 200 trains/24 h. The bridge has 4 main cables Ø 1,24 m, each cable containing 44'352 pcs. of ca. Ø 5 mm steel wires, and those 4 cables are situated as pairs at each side of the bridge deck. The Messina Bridge is designed to withstand earthquakes of 7,1 richters and wind speed of 60 m/s, which figures are lower than those of the Akashi Bridge: 8,5 richters and 80 m/s.

Fig.1: General view of the Messina Strait Bridge

**Photo credit: Illustration of this article, courtesy Stretto di Messina S.P.A.*

In the 2006 plan the construction was expected to start during the second half of 2006, the scheduled completion year being 2012 **[2]**. Owing to the delay in the commencement, the expected completion year might now be earliest about 2015 – provided that the project will now really be started.

References:

[1] Juhani Virola: "Gigantic Messina Strait Bridge to be commenced" (in Finnish)". Tierakennusmestari 2006:2, p. 58-60. www.tierakennusmestari.fi

[2] Information and illustration kindly given by Stretto di Messina S.p.A., Italia.

[3] "Messina bridge put 'on hold'". Construction Europe, Nov.2006, p. 7.

[4] "Italian minister commits to Messina Bridge". Bridge Design & Engineering, webnews published on 2008-05-27.

[5] David B. Steinman: "The Messina Straits Bridge". Columbia Engineering Quarterly, Jan.1951, p. 8-11 & 30.

[6] Chris Sleight: "Impregilo to build Messina bridge". Construction Europe, Nov.2005, p. 6.

[7] Juhani Virola: "Two long-span suspension bridges – Part 1". Suara Perunding 2003:4, p. 24-28.

Fig.3: Longitudinal profile of the bridge.

Fig.4: Cross-section of the deck.

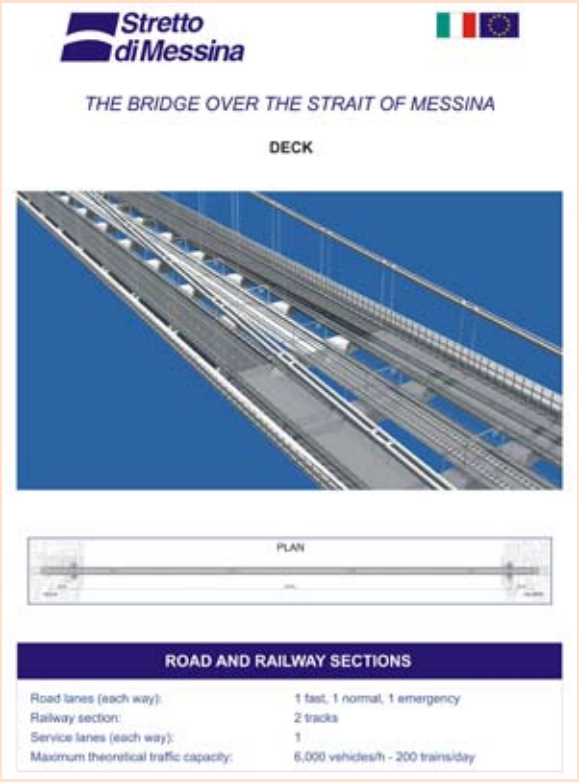

Fig.2: Perspective view of the deck and plane of the bridge.

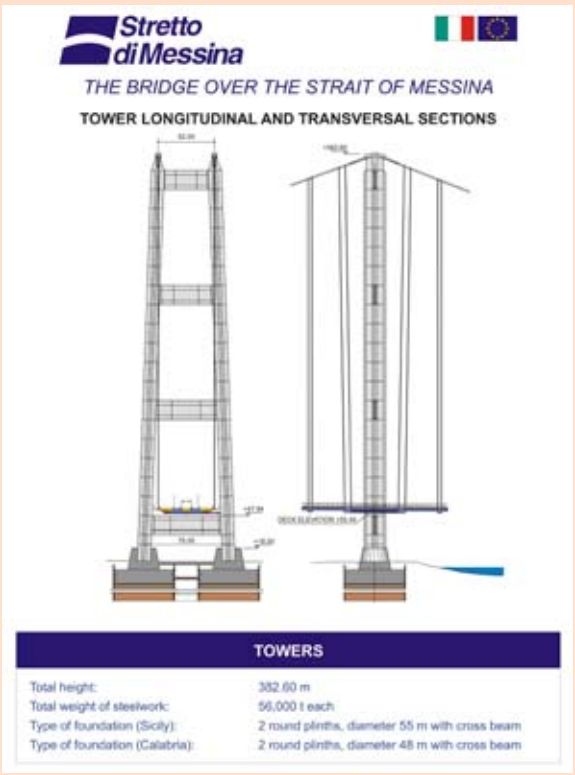

Fig.5: Front and side elevation of the tower.