The Taizhou Bridge

great 3-tower suspension bridge in China

General view of the Taizhou Bridge.

The Taizhou Bridge is situated in Jiangsu Province, China, and it was built across the Yangtze River about 120 km downwards from Nanjing city. The bridge is located along highway, between Taizhou town on the north shore and Zhenjiang town on the south shore of the river, Ref. [1-2]. Due to its 2 main spans (à 1080 m), the Taizhou Bridge belongs among the greatest suspension bridges in the world [3].

Of its structure, the Taizhou Bridge is a 3-tower suspension bridge and each tower has 2 legs. Between the 3 towers, there are 2 main spans à 1080 m, and beyond each main span there is one side span of 390 m. The side spans are not supported by main cables and hangers, but by underneath piers. The total length of the suspension bridge including its two main spans and two side spans is 2940 m. Beyond the suspension bridge, there are at both shores approach viaducts, and the total length of the bridge structure is 6,8 km.

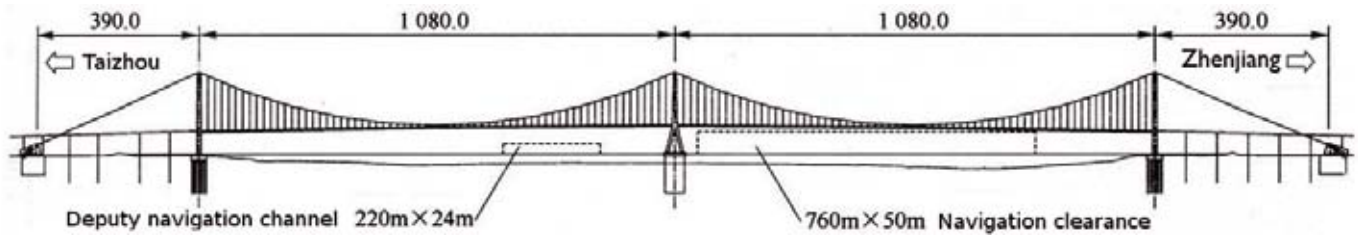
The middle tower is steel structure, height 192 m. In the longitudinal profile (side elevation), the shape of the middle tower resembles an inverted Y, the both legs ramifying downwards from the bridge deck level. Each side tower is of concrete construction, height 178 m. All the three towers have cross-beams at the top of tower and below bridge deck.

Middle tower under construction.

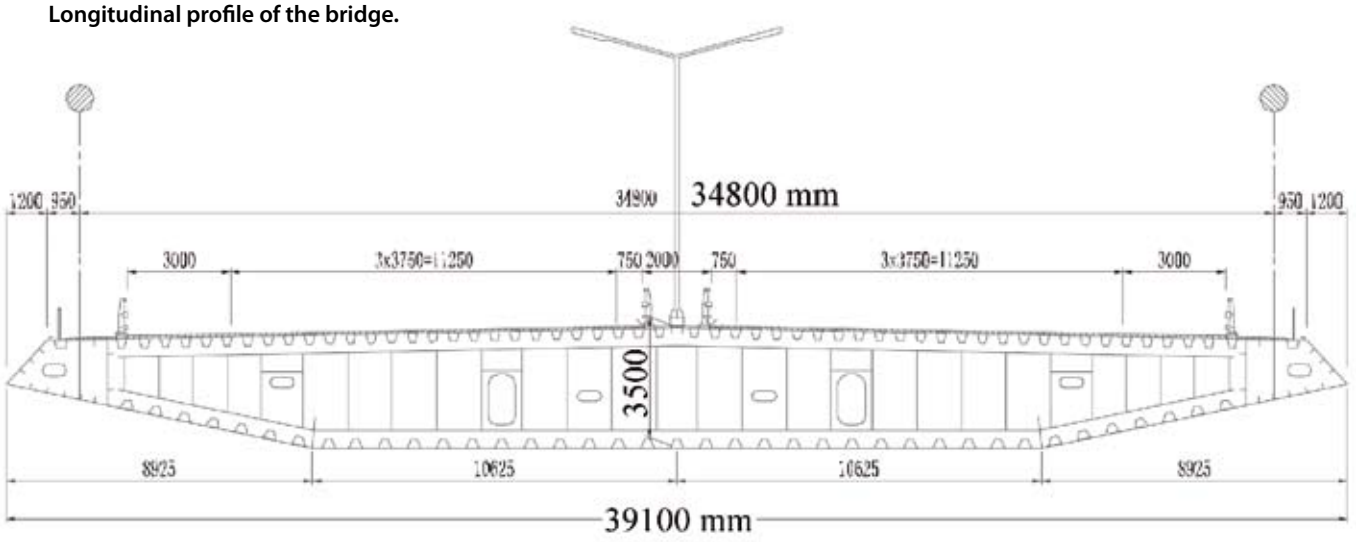
The concrete anchorages are located at end of both side spans. There are two main cables each Ø 72 cm, transverse distance 34,8 m. The hangers consist of parallel ropes, which in turn consist of high-strength parallel steel wires Ø 5,2 mm, tensile strength 1670 MPa.

The bridge deck structure is a streamlined steel box, structural height 3,5 m, total width 39,1 m, underclearance 50 m at the southern main span. There are 2 roadways at the bridge, each containing 3 traffic lanes à 3,75 m, and at both sides there is a 3,0 m wide maintenance lane. The permitted speed for vehicles is 100 km/h.

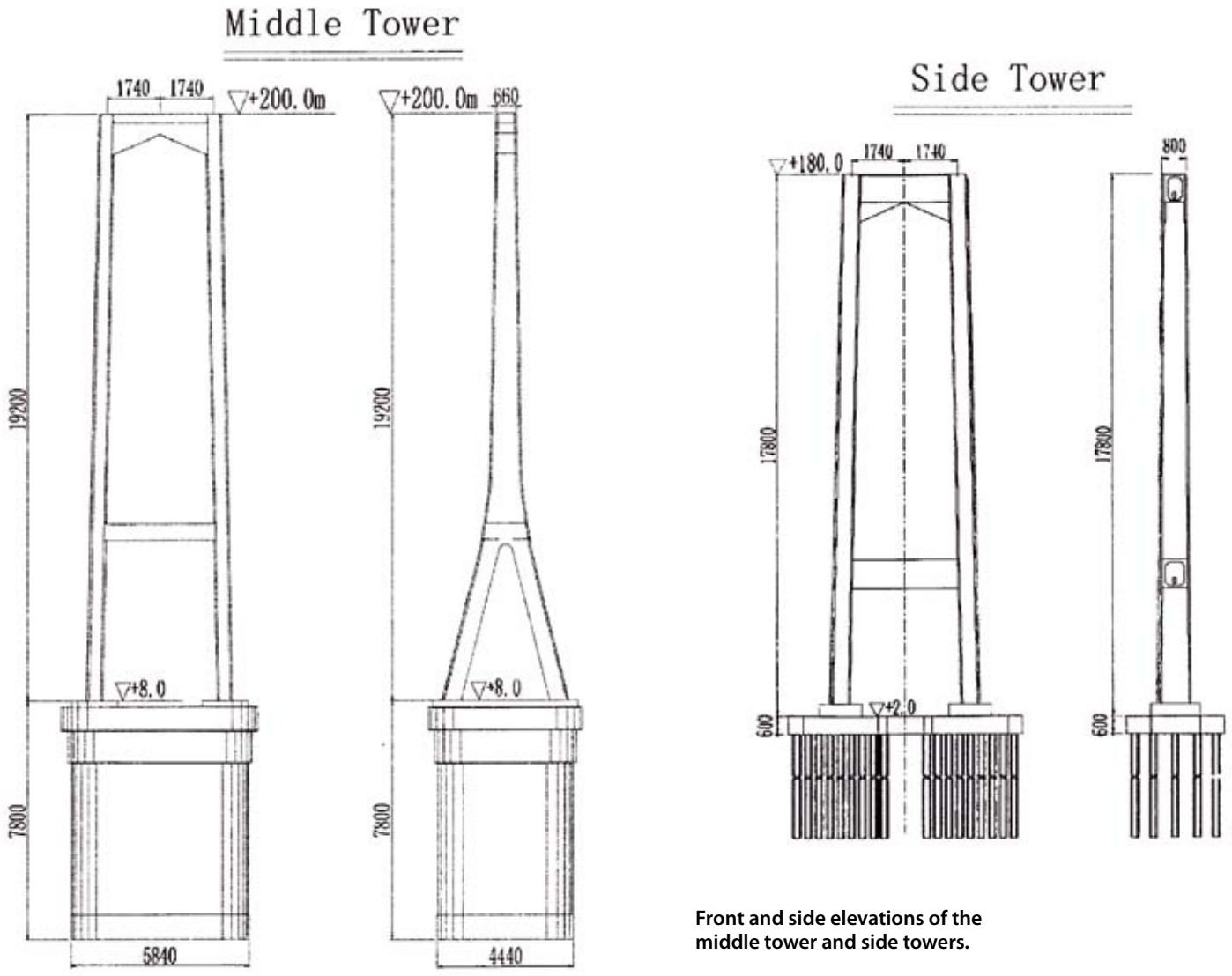
Jiangsu Provincial Yangtze River Highway Bridge Construction Commanding Department (JPCD) is in charge of the construction of the whole project. The design union is mainly based on Jiangsu Provincial Communication Planning and Design Institute



Longitudinal profile of the bridge.



Cross-section of the bridge deck.



Front and side elevations of the middle tower and side towers.

Middle tower foundation under construction.

South anchorage under construction.

View of the Taizhou Bridge under construction.

Co. Ltd, together with China Zhongtie Major Bridge Reconnaissance & Design Co. Ltd and Tongji University. The contractors are comprised of the Second Highway Engineering Co. Ltd (CHEC), the Second Harbour Engineering Company Ltd (SHEC), China Zhongtie Major Bridge Engineering Group Co. Ltd (MBEC), China Railway Baoji Bridge Group Co. Ltd (CRBBG) and Jiangsu Fasten-Nippon Steel Cable Co. Ltd (JFNC). The consultancy of the bridge are mainly composed of CCCC Highway Consultant Co. Ltd (HPDI), Dorman Long Engineering Technology Consultant (Shanghai) Co. Ltd and Chodai Co. Ltd. [1].

Construction of the bridge was commenced in 2007, opened to traffic in 2012, the cost being about 400 million dollars (USD) [2].

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Finnish summary:

Kiinassa valmistui viime vuonna suuri 3-pyloninen Taizhoun silta. Se sijaitsee Jiangsun läänissä ja ylittää Jangtse-joen noin 120 km alavirtaan Nanjingin kaupungista. Jänneväleiltään (2 à 1080 m) Taizhoun silta kuuluu maailman suurimpien riippusiltojen joukkoon.

References:
[1] Information and illustrations kindly given by the Jiangsu Provincial Yangtze River Highway Bridge Construction Commanding Department (JPCD).
[2] Che Chen & Jianchi Chon: "Taizhou triple". Bridge Design & Engineering 2012:1, p. 26, 28 –29 & 31.
[3] Bridge tables of the Helsinki University of Technology, www.bridge.aalto.fi/en/longspan.html