



Innovations and Breakthroughs in China's Zhangjinggao Yangtze River Bridge

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Abstract

The Zhangjinggao Yangtze River Bridge currently under construction is located in the lower reach of the Yangtze River in Jiangsu Province, China, connecting the cities of Zhangjiagang, Jingjiang, and Rugao. It consists of two river-crossing bridges, one on the south channel and the other on the north channel of the Yangtze river. The south channel bridge is a double-span suspension bridge. In order to minimize the impact of bridge construction on the water traffic and the ecological environment of the Yangtze River, the beam span layout is designed to be 2300 m +717 m, and the cable span layout is 660 m + 2300 m+ 1220 m. When the construction is completed, it will become the world's longest span bridge, which is a veritable world-class mega structure. Since the bridge span breaks the records of all the existing bridges in the world, there is no standard to refer to and no experience to learn from. In order to solve the technical problems brought by the mega long span, the project construction team has utilized technological innovations, proposed six new world concepts, and therefore set six world records.

Keywords: Zhangjinggao Yangtze River Bridge; Longest span suspension bridge; Self-balancing structural system; Steel box and steel tube confined concrete composite tower; Double-loop composite diaphragm wall anchorage foundation; Technological innovation.

1 Introduction

The Zhangjinggao Yangtze River Bridge is a crucial river-crossing link to be constructed during China's 14th Five Year Plan Period as highlighted in both the Yangtze River Principal Arterial River-Crossing Layout Plan (2020-2035) and the Comprehensive Transportation Corridor Plan of Jiangsu Yangtze River Economic Belt (2018-2035). In order to implement the national strategy of integrated development of both the Yangtze River Delta

region and the Yangtze River Economic Belt, to optimize the design of the Yangtze River crossing, to improve the layout of the regional road network, and to promote the construction of the Yangtze River city cluster, early completion and operation of the Zhangjinggao Yangtze River Bridge is of great significance.

The total length of the project route is about 30 km, and it consists of two bridges to cross the Fujiangsha channel and the Rugao middle branch channel of the Yangtze River, respectively. For the