

Design innovation of Zhangjinggao Yangtze River Bridge

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ABSTRACT

Zhangjinggao Yangtze River Bridge is located in the lower reaches of the Yangtze River. Considering the navigation, river regime, flood control and other control factors, it is recommended to adopt a two-tower and two-span suspension bridge with a bridge span of 2300+717m. The bridge site is dominated by soft ground, complex construction conditions, and the asymmetric characteristics of the bridge span are remarkable. The systematic scientific research of the bridge is carried out from six aspects: design standards, structural static and dynamic characteristics, new structural system, new materials, new components, industrial and intelligent construction, and integration of construction, management and maintenance. Innovative designs such as the main cable self-balancing structure system, steel box - steel tube constrained concrete composite cable tower, supporting and rotating structure composite ground wall anchor foundation, mega large self-walking assembly cable saddle, intelligent sensing and replaceable anchorage system, the integrated dehumidification system for the whole bridge, L-shaped longitudinal rib orthogonal steel bridge panel are proposed, which comprehensively solve the major problems in the construction and maintenance of the whole life.

Keywords: two-tower and two-span suspension bridge, soft ground, asymmetry, seven innovative designs.