

Construction technology innovation of 2300-meter suspension bridge: new diaphragm wall and composite tower

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ABSTRACT

Zhang-Jing-Gao Yangtze River Bridge adopts a double-span suspension bridge with a main span of 2300 meters. The anchorage foundation adopts a composite diaphragm wall, which is used as an temporary supporting structure during construction, and then transformed into a permanent structure, and the main tower adopts a 350-meter composite structure of steel box and steel tube confined concrete. This diaphragm wall has high requirements on the verticality of the slot segment and the installation precision of the rigid joint, and there are difficulties in segment hoisting, linear control and the construction quality control of steel tube concrete of super high tower. Therefore, technical research was carried out: (1) The intelligent aided decision-making system for trenching, the automatic detection and adjustment device for slurry performance, and the three-dimensional shape detection technology for slot are developed to achieve high-precision trenching; (2) The high-precision manufacturing and installation technology of new rigid joint and steel reinforcement cage is studied to reduce the stuck risk; (3) Through the application of W12000-450 intelligent tower crane and construction control with the whole process control concept, the purpose of high precision control of tower alignment is achieved; (4) The pouring platform on tower of concrete and construction technology of self-compacting concrete with 40-meter high drop are developed to ensure the construction quality of steel tube concrete.

Keywords: Diaphragm wall; Composite tower; Trenching precision control; Steel tube concrete construction.