

Tensioning Process of Sanhao Arch Pylon Cable-Stayed Bridge

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Summary

Sanhao cable-stayed bridge located in Liaoning Province of China features an impressive arch pylon system including two inclined steel arch ribs laterally across the bridge deck. The two 60m-high arch ribs stretches out from the same base on the main pier foundation and separates up to 55m at the top, which have the appearance of two tennis rackets. Ten pairs of longitudinal cables on both sides connect these two “tennis rackets” forming a triangle pylon system. Twenty pairs of inclined stay cables link the steel arch pylon and the prestressed concrete deck, which carry the self-weight of the deck and service loads. The tensioning process of the horizontal and inclined stay cables, especially the tensioning process of the individual strands for each cable, is the most challenging work of the bridge construction for achieving a sustainable structure, characterized by the smooth lines of the arch pylons and bridge deck, the safe stress of the steel arch ribs and the crack-free prestressed concrete deck.

Keywords: arch pylon; prestressed concrete cable-stayed bridge; beam grillage method; three-dimensional finite element method; tensioning process of stay cables



Fig.1: Front view of Sanhao bridge