



Innovative Idea and Practice of Combined-Type Bridge Building

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Abstract

The common bridges are beam, cable, arch. Two of them are combined together according to the following principles: structural deformation coordination, joint force transfer, mutual use in construction. As a result, it would form a new-type bridge, which is named as combined-type bridge. And the combined-type bridge is different from bridge combination structure that refers to the combination of concrete and steel in the same section of the beam.

When the bridge reaches a certain span, its strength, stability and dynamic property are in very high demands. The beam bridge has to increase the beam height and the flexible cable structure bridge needs to be strengthened to meet the stiffness requirements so that its spanning ability is limited. And the arch deformation form of arch bridge will make the bridge deck becoming a wave curves, so that the deck curve of high-speed railways bridge affects the smoothness and comfort of the train. Due to the requirements for bridge building in future traffic development, it is necessary to combine the advantages of the strength, deformation and stability of a single basic bridge structure to create a new type of the combined-type bridge structure. The combined-type bridge can create a variety of bridge architectural models which fully embody the importance of the traffic function and artistic modelling in future city. The combined-type bridge skillfully makes the bridge modelling emphasize the mechanical modelling expression.

This paper will discuss the innovative technology, the structural deformation compatibility, joint force transfer of combined-type bridge buildings and the design practice of it to improve the stiffness and stability of the structure.

Keywords: bridge; combined-type bridge; architectural modelling; innovative ideas.

1 Definition

The structures of beams, cables and arches in the basic bridge are combined together according to the following principles: structural deformation compatibility, common load transferring, mutual use in construction. As a result, it would form a new-type bridge, which is named as combined-type bridge. This new type of bridges superpose the basic structure to each other, such as beam

and arch, beam and cable, cable and arch. This combined-type bridge structure is based on the stress and deformation of the bridge structure, and as a combination of the bridge structure, the structural deformation inhibition, the common transmission force, the construction and installation of the components are mutually utilized, it becomes a new type of combined-type bridge structure bridge. This is a new type of combined-bridge with unique architectural