Construction control of an urban space steel arch bridge with double cable planes

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Summary

Pingcheng Road Bridge is an urban space steel arch bridge with a main span 89 m. The space arch and curve deck system will be assembled in temporary false work, and the influence on deck system of false work under cables tensioning construction should be considered. The keys about the construction control of this bridge are as the following: 1) the reasonable tensioning time and forces of cables taken the influence of false work into account; 2) the accurate transverse pre-camber of deck system; 3) the appropriate removal time and sequence of false work; 4) the overall and local stability of bridge in the whole construction process.

Keywords: construction control; arch bridge; one-time tensioning; influence of false work; removal time and sequence.

1. Introduction

Pingcheng Road Bridge with a main span 89 m, located in chrysanthemum garden district in Shanghai of China, will be open in 2012. The prefabrication of its main girder and arch will complete soon. Fig.1 is a design sketch of the bridge.

The curved main girder with a width 25 m and the footbridge with a width 2.5 m of this half-through steel arch bridge are separate, while the main girder and the arch are separate. The arch and the girder are connected by 30 cables, while the arch and the sidewalk are connected by 2 cables.

The axis of main arch with variable box cross-section, the span and the rise of which are 76 m and 38 m, adopts a second-degree parabolic.

The main girder, which adopts flat steel box, has a plane curve with a radius 608 m.

The footbridge with a span 84.568 m, which adopts steel box cross-section, consists of two straight lines and two circular curves.

Fig. 1: Design sketch of the bridge

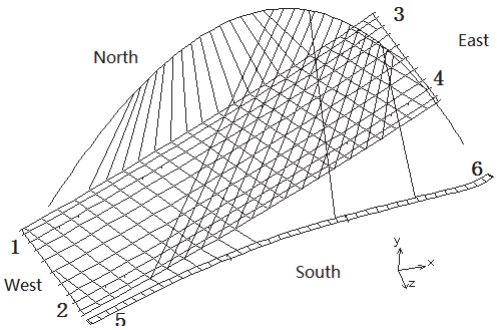

Fig. 2: Calculation model

https://doi.org/10.2749/222137912805110592