Innovation Design for New Style Truss Bridge in China

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Abstract

This paper introduces the key points about designing a new structure truss bridge with double decks to meet for 14-lane traffic in China. The main innovation points include the overall structural design, three main truss internal force uniformity adjustment, rigid hanger design, installation and internal force adjustment etc. The comparison lower completion cost of the main bridge in this area which also proves the rationality and economy of the structural design.

Keywords: truss bridge; expressway; multiple-lane; triple-plane truss; double decks.

1 Introduction

Dongguan is situated at the Pearl River Delta of Guangdong province, construction of the road and bridge is restricted by land space and it will require a large amount of extra engineering investment for relocation of concentrated private industrial processing workshops. According to the requirements of crossing the river proposed by the Client, the new bridge must serve as both the northward extension of Shenzhen-Dongguan Expressway and a new fast passageway of Dongguan urban area.

The Designer proposed of building a double-deck steel truss bridge within the limited plane space of the existing HV power transmission line corridor and this competitive scheme was quickly accepted by the Client.

Dongjiang Bridge adopts a brand new steel truss structure with curved stiffened strings. The design double-deck structure can meet the multiple-lane traffic function. The upper part of the bridge adopts a variable structure height and a stiffening method which is similar to that of the self-anchorage suspension bridge. Thus, minimize the length of the approach bridge while meeting the navigation clearance. Engineering cost can be reduced, and the coordination and unification of structure force, traffic function and architectural landscape can be ensured.

This design boasts of an innovative structure and practical traffic function, winning the applause of the bridge engineering field and quickly becoming a landmark. The rendering view is shown as Figure 1.

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