

Conceptual Design of Double-Deck Traffic for City Bridge

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Abstract

With urban development, the conflicts between the urban spatial structure and the transportation system become increasingly prominent. Innovative structural design and traffic arrangement of the bridge are required.

The principles and conditions for achieving conceptual design of double-deck traffic (or double decks) for city bridges are put forward from the point of view of saving land resource and improving traffic efficiency by means of research and analysis of bridge basic structural system as well as structural component performance, the ways to carry out innovative design of the double-deck traffic are proposed through arrangement of the basic structural system and structural components, and finally actual example of the double-deck traffic is provided on an engineering practice basis.

Keywords: Double-Deck Traffic, City Bridge, Conceptual Design.

1. Preface

As China's economic development, land scarcity and bridge construction land tensions have become increasingly prominent. At the same time, the traffic volume grows rapidly, and a large number of single-deck city bridges that have been built are increasingly congested, and become an obstacle to ease the traffic bottleneck. Therefore, double-deck traffic (or double decks) which can greatly improve the traffic efficiency and driving condition in the limited land is a good solution.

2. Conceptual design of double-deck traffic

Conceptual design of double-deck Traffic is an innovative design, which is based on bridge design and construction codes. It uses the Mechanics, structural systems, cross-section layout, structure of the construction and other related knowledge to achieve double-deck traffic on the city bridges. The structural design of the double-deck bridge can be achieved through either the innovative combination of structural systems or the change of structural arrangement and construction bond.

2.1 Classification of the bridge structure systems

Bridge structure type can be classified according to mechanical properties, the use of materials, structure function and the construction method. From the double-deck traffic needs of conceptual design, the bridge structure systems can be divided into girder bridge, arch bridge, beam combination of arch bridge, cable truss structural bridge system, according to the main characteristics of mechanical properties of bearing structure.

2.2 Basic element types of the bridge

According to the force characteristics of elements, bridge superstructure can be divided into rigid and non-rigid basic elements. The former includes the linear elements such as beams, trusses, columns, frames and arches, as well as surface shape elements, such as plate, shell, etc. The latter