



Configuration Design of Viaduct Pier in Urban Highway

Yanjun Jin, Keli Xiao, Lin Li, Aijia Zou, Xinglong Duan, Wei He

Southwest Jiaotong University, Chengdu, Sichuan, China

Chongwei Yuan

China Southwest Architectural Design and Research Institute Corp.LTD, Chengdu, China

Contact: 392191671@qq.com

Abstract

Urban highway viaduct plays an indispensable role in reducing the pressure of the urban traffic. The configuration design of the pier is very necessary which need to meet both the structural safety and aesthetic logic, especially in rapidly developing economies. Some valid principles of the pier configuration design were summarized. Based on the characteristics of urban highway viaduct pier, the reasons why the piers aesthetic design is more difficult was analysed and some methods for the configuration design was given. Based on a bridge project that is located in Chengdu, China, three configuration design schemes of piers were analysed and compared from different aspects, which reflect some emphases of the pier configuration design. The configuration design of urban viaduct pier is significant to increasing aesthetic perception and shaping the urban culture, and should be adopted by the designer

Keywords: configuration design; urban highway viaduct; bridge pier; aesthetic.

1 Introduction

Configuration has no clear term definition in Bridge and Structural Engineering. The meaning of configuration is an arrangement of a group of things, and is a chemical terminology as well. [1]

The traditional bridge design focuses more on the safety, applicability and durability of the structure, but lacks aesthetic considerations, which often leads to the lack of individuality and the formal similarity to bridges.

Different from traditional design, the configuration design encouraged in this paper satisfies both the functional requirements of structure and the aesthetic logic.

Urban highway viaduct plays an indispensable role in reducing the pressure of the urban traffic. The visual appeal of urban viaduct forms is greatly influenced by the substructure units. Due to the lack of aesthetic considerations, pier, a key component of urban viaduct, often makes viaduct tends to be short of the personality of the modern city. The configuration design of the pier is very necessary which need to meet both the structural safety and aesthetic logic, especially in rapidly developing economies.

2 Principle of configuration design

Bridge designs must be governed by valid rules.

In 1990, David Billington of Princeton University defined the three principles of good bridge design