



Experimental Design of Link Slab in Steel-Concrete Composite Bridge

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Abstract

The traditional simple-supported structure with continuous deck have the advantages of simple structure, clear stress, being suitable for prefabrication and assembly, and rapid construction. However, a large number of continuous bridge deck structures appear in practical bridge engineering. Prominent problems such as vulnerability and poor durability restrict its further promotion and application, and some even turn to "first structure is simply supported, then structure is continuous", which increases a large number of on-site construction and reduces the efficiency of prefabrication; especially when used in composite structure bridges. It also causes the problem of cracking control of the bridge slab concrete in the negative bending moment area of the continuous beam. Aiming at this engineering pain point, this paper proposes a new type of continuous structure of simply supported steel-concrete composite beam bridge deck. In order to study the static performance of the continuous bridge deck structure, this research designs a full-scale I-shaped segment test model and conducts a numerical analysis on it. The calculation results are compared with the full bridge model to verify its feasibility, preparing for a follow-up test.

Keywords: simply supported beam; Debond Link Slab; full-scale segment test.

1 Introduction

Simply supported beams have the advantages of good economic benefits, simple structure, clear force, and fast construction speed, and occupy an important position in the construction of modern bridges in China. However, there are many expansion joints of simply supported beams, which reduces the flatness of the bridge deck. Vehicles are prone to jumping at the expansion joints, which

seriously affects driving speed, safety and comfort. In addition, the expansion joints bear the dynamic load of the automobile for a long time, are easy to damage, difficult to maintain, and need to be replaced frequently.

In order to solve the above problems, in the late 1970s, engineers put forward the concept of "continuous bridge deck", which means that two adjacent spans of simply supported beam bridge decks (all or part) or deck pavement are connected