



Property Analysis of Link Slab in Steel-Concrete Composite Bridge

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Abstract

Simply supported bridge has been widely used because of its low cost and clear mechanical behavior. However, there are many expansion joints, which reduce the integrity of the bridge deck and affect the driving comfort. Besides, the expansion joint is easy to be damaged due to the vehicle dynamic load. In order to overcome the above problems, the best way is to reduce or even cancel the expansion joint. The common methods are continuous structure and continuous bridge deck. The former is realized by transforming the simply supported bridge into continuous bridge or rigid frame bridge. But its construction is more complex, which reduces the prefabricated assembly rate. While the latter refers to the structure replacing expansion joint to link slab to keep decks or deck pavements of simply supported bridges continuous. It maintains the mechanical advantages of simply supported structure and can provide continuous lane for the comfort of driving. The structure with link slab has the strengths of convenient construction and low cost, so it is a bridge type worthy of promotion. In this paper, a four-span simply supported steel-concrete composite bridge with four channel girders is studied and a new type of continuous bridge deck structure is proposed. The numerical model of the whole bridge is built, and the influence of span, thickness of link slab and unbonded length of link slab on the mechanical property of continuous bridge deck structure is studied.

Keywords: simply supported beam; Debonded Link Slab; Unbonded length; Thickness of DLS.

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