

The research on live load model for High-Speed Passenger Railway Bridge

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Summary

Live load model play a significant role in designing and constructing of High-Speed Passenger Railway Bridge (HSPRB), especially the passenger dedicated, because it can affect the strength, stiffness and service performance of the bridge. Extra resource and material would be wasted if live load is selected too high while the safety and performance of the bridge would be threatened if live load is too low. In this paper, a comparison of the technical standards of the current HSPRB live load model among different countries has been put forward. Next, the live load models in China's HSPRB with the speed of 350km/h and 250km/h have been researched respectively, which could provide a reference for revising codes and designing bridge in the future.

Keywords: passenger railway, live load model, effect research

1. Introduction

There are two kinds of HSPRB in China, one with the speed of 350km/h, the other with the speed of 250km/h which will freight vans in recent years. The former should be designed by ZK live load while the later, for security, should meet the requirements of China's Current Standard Railway (CCSR) live load and ZK live load at the same time.

Based on a series of small and medium-span bridges in China's HSPRB, including simply supported beams with spans of 16m, 23.5m, 31.5m, 38.5m and continuous beams of 32+40+32m, 40+56+40m, 40+64+40m, 40+72+40m, 48+80+48m, 60+100+60m, the paper research the live load model in HSPRB with the speed of 350km/h and 250km/h in China separately.

2. Survey of HSPRB live load models in different countries

2.1 Survey of live load representative figure in HSPRB

2.1.1 HSPRB live load representative figure in the Continent of Europe

In the Continent of Europe, they generally use UIC live load to design HSPRB (as shown in

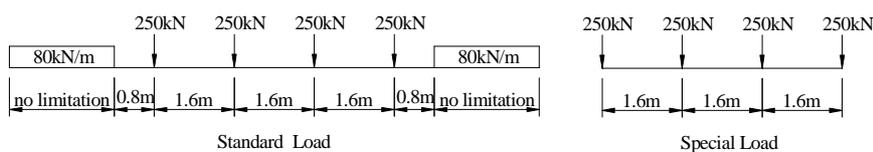


Figure 1). In most countries, the basic live load pattern is identical and they only make a little supplement according to each country's reality. It allows for all combinations

Fig. 1: UIC live load

of vehicles currently running or projects to running on railways. The currently running vehicles in the Continent of Europe are: the extra heavy train with the maximum speed of 80km, the heavy van with the maximum speed of 120km, the motor coach with the maximum speed of 250km and the