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Effect of expansion joint on seismic response of curved ramp bridge

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Abstract:

Aiming at pounding of expansion joint in multiple continuous girder curved ramp bridge, the paper builds space dynamic model of a curved ramp bridge with expansion joint, and simulation of pier column, beam, bearing and expansion joint. Using nonlinear time history analysis, the paper demonstrates expansion joint's effect on dynamic characteristics of a curved ramp bridge in four different theoretical models and its dynamic response under different types of seismic input. The result indicates that multiple continuous girder structure without expansion joint at abutment is a very favorable structure for seismic.

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I. Introduction

In order to satisfy traffic requirement, there are a lot of plane furcations and congregations or elevation overcrossing and undercrossing in a multilevel junction system, where the ramp bridge is an important component. Its structure configuration is much long and curved. According to the actual engineering structure, the ramp bridge is composed of multiple units (where one continuous girder is defined as one unit) with expansion joint. Generally it is named as a curved ramp bridge.

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