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3D Dynamic Modeling of Transition Zones

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Abstract : In railways transition zone is present at the boundaries of zones with different stiffness. When a train rides from an embankment onto a stiff structure, such as a bridge, tunnel or culvert, an abrupt change in the support stiffness occurs possibly inducing differential settlements. This in long term can yield to the degradation of the tracks and foundations in the transition zones. A number of techniques have been proposed or implemented to provide gradual stiffness transition at the problem zones, such as methods to ensure gradually changing pad stiffness, application of long sleepers or installation of auxiliary rails in the transition zone. Aim of the research presented in this paper is to analyze the 3D and the dynamic effects induced by the passing train over an area where significant difference in the support stiffness exists. The effects were analyzed for different arrangements associated with certain differential settlement mitigation strategies of the transition zones.

Keywords : culvert, dynamic load, HS small model, railway transition zone
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