Numerical Analysis on the Contribution of Each Member to Structure-Borne Sound in Reinforced Concrete Rigid-Frame Viaducts

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In this study, a numerical experiment was carried out using a finite element modelling to quantify the contribution of each member to structure-borne sound. As examples of specific results, the contribution to the overall value at the 25m point on a reinforced concrete (RC) rigid frame viaduct was 73% for the center slab, 10% for the soundproof wall, and 17% for the cantilever slab. In addition, the contribution of the RC rigid frame viaduct and the adjacent RC girders was 67% and 33% respectively. This indicates that not only the rigid frame viaduct but also the RC girder may have a relatively large contribution to structure-borne sound along the railway line.