Improvement of Skeleton Curves for Nonlinear Dynamic Analysis
Employing Single Degree of Freedom Model of Railway Bridges and Viaducts

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A dynamic analysis employing the nonlinear single degree of freedom (SDOF) model is generally used to carry out the seismic design of railway bridges and viaducts. Although structures are represented with bi-linear type skeleton curve in the model, it does not necessarily reproduce the nonlinear behavior of the structure obtained from the pushover analysis. Especially, the response values calculated by the method are largely different from those obtained from the precise model for small and medium earthquakes. In this study, a new skeleton curve employing the ellipse function was proposed to improve the precision of dynamic response in regions at around yielding. It was confirmed that the non-linier response estimated by the SDOF model with proposed curve showed good agreement with that from precise dynamic analysis.