Equivalent Single-degree-of-freedom Method for the Nonlinear Dynamic Analysis of Embankments

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In this research, a nonlinear dynamic analysis method by means of an equivalent single-degree-of-freedom model is proposed for the seismic design of railway embankments. The response of an embankment calculated by the method proposed is well consistent with the response calculated by the 2D finite element method. From the results of static push-over analyses for various embankments, the model parameters used for the method proposed are characterized. These parameters can be represented by simple information such as the height of the embankment. Since using the method proposed we can evaluate the dynamic response of railway embankments more conveniently than the conventional method, it is useful as a response evaluation method of a huge number of railway structures.