Proposal for a Method that Takes into Account the Damage Process before Sliding Failure to Verify the Seismic Performance of Railway Embankments and Its Application to Safety Assessment

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Newmark's sliding block method is used as a standard response analysis method in the seismic design of railway embankments. Although this method is very practical and useful, it has some problems, for example, that it cannot accurately simulate the actual damage to embankments observed in past major earthquakes. In this paper, the authors propose a performance verification method for the seismic stability of embankments taking into account the damage process using the shear strain accumulated at the toe of the embankment as a verification index, the validity of which is verified using the centrifuge shake table tests. In addition, as an example of application of the proposed safety assessment method, the response analysis using a finite element method is also discussed.