Construction of an Appropriate Response Evaluation Method for the Surface Ground in Seismic Design

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In the seismic design of railway structures, it is necessary to properly evaluate the behavior of the surface ground by time history nonlinear dynamic analysis. However, in the case of a special soil layer including the liquefaction ground, it is a problem that the behavior of the surface ground cannot be evaluated appropriately even if the conventional evaluation method based on the deformation characteristics is applied. Therefore, we proposed a method for testing the deformation characteristics of soil and conducted the analysis of the ground response using the master curve calculated by the test method proposed. Next, we devised a hybrid ground response test by which we can evaluate precise response to special soil layers including the liquefaction ground. Finally, we examined the validity of the proposed testing method by comparing the results obtained from it with those of the hybrid ground response test.