Effect of Ground and Structure Damping on Combination of Inertia Force and Ground Displacement in Seismic Deformation Method

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The seismic response values of pile foundation structures are calculated using the seismic deformation method, which uses inertia force and ground displacement. This paper presents a study that aims to achieve a highly accurate estimation of the combination of inertia force and ground displacement. Specifically, dynamic analyses were conducted for various types of grounds and structures under conditions where either damping was varied. The combination coefficients of the actions were then compiled and discussed. The result clarified that the combination coefficients of the actions change with the damping of the grounds and structures. Using this trend of change, a simple formula has been proposed to calculate the combination coefficient of the actions, taking into account the effect of damping. Using the proposed method, it is possible to set more appropriate coefficients than before, taking into account the damping effects on the ground and structure.