Effect of Natural Period of Ground in Linear Region on Combination of Inertia Force and Ground Deformation in Seismic Deformation Method

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Inertia force and ground deformation are used to calculate the seismic response values of pile foundation structures using the seismic deformation method. In this paper, a study was carried out towards a highly accurate estimation of the combination of inertia force and ground deformation. Specifically, linear dynamic analyses were conducted on various types of grounds and structures, and the combination coefficients for the ratio of the period of grounds to the period of structures were calculated. As a result, it is clarified that the correction coefficient v gradually decreases as the natural period of the ground T_g increases. Considering this tendency, we proposed a simple estimation method for the combination coefficients. In addition, it was confirmed that the proposed method expressed the results of dynamic analysis more appropriately than the conventional method. The proposed method makes the combination coefficients more accurate and the seismic response values of structures more reasonable.