

## PROPOSAL OF DESIGN FORMULA TO CONSIDER THE REDUCTION IN SEISMIC LOAD DUE TO SOIL-STRUCTURE INTERACTION

-Evaluation of the effect of soil-structure interaction based acceleration response-

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This paper proposed design formulae that enable to evaluate the soil-structure interaction in seismic design load.

In this paper, the authors compared the fixed-base model and Sway-Rocking model and proposed design formulae based on the relationship between the difference of vibration characteristics and the difference of acceleration response in the above two models due to the soil-structure interaction. In addition, by visualizing the evaluated value by the design formulae, we proposed to easily incorporate the soil-structure interaction which was difficult to consider in structural design.

The proposed formulae are represented by the product of "inertial interaction" and "kinematic interaction", and the design formulae of each interaction are constructed in a simple form such as product of influence factors and weighted average. The proposed formulae can be applied to a wide range of verification of seismic load independent on parameters of earthquakes, buildings and ground.

Evaluating the soil amplification function for modeling various complicated behaviors is needed for formulation of the two interactions. Based on the idea of smoothing the soil amplification function, the proposed formulae of this paper uniformly expresses the two interactions and presented the new viewpoint to the interactions which has often been evaluated individually.