عنوان مقاله:

COMPARISON THE EFFECTS OF ELASTIC AND INELASTIC DAMPING RATIO OF EQUIVALENT REPLACEMENT OSCILLATORS TO ANALYZE SOIL-STRUCTURE SYSTEMS

محل انتشار:

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خلاصه مقاله:

A common analysis method of soil-structure systems in seismic design procedures, is to replace the entire soil-structure system by a fixed-base oscillator with an equivalent fundamental period and damping ratio to consider inertial effect of soil-structure interaction (SSI). Current SSI-related regulations in seismic codes, such as NEHRP (2003) are based only on the knowledge of the SSI effect on elastic response of structures. However, recent studies indicate that the effects of SSI should be reconsidered when a structure undergoes a nonlinear displacement demand. In recent documents on nonlinear static procedures, FEMA-440 (2005), a modified damping ratio of the replacement oscillator was proposed by introducing the ductility of the soil-structure system obtained from pushover analysis. In this paper, a comparison is performed between FEMA-440 (2005) inelastic equivalent damping ratio and common elastic damping ratio definitions to investigate the accuracy of seismic ductility demands resulted from these equivalent replacement oscillators against exact ductility demand of structures with surface and embedded foundation, by conducting a parametric study using 20 ground motions recorded on soft soil site E, on which the more SSI effects are probable.

کلمات کلیدی:

Soil-Structure interaction, Replacement oscillators, Elastic and inelastic equivalent damping ratio