عنوان مقاله:

Calculation of Seismic Interaction Forces and Interactioninduced Excitation for Coupled Rigorous-Substructure SSI Analysis

محل انتشار:

هشتمین کنگره ملی مهندسی عمران (سال: 1393)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

In this study, some earthquake records have been inspected for the sake of seismic soilstructure interaction (SSI) analysis in order to assess the interaction forces between the linear elastic far-field and the nonlinear inelastic near-field. The interaction forces may later be used to examine SSI effects using the substructure method to satisfy the infinite boundary condition after modeling the near-field rigorously. These forces, which will later result in the realexcitation to the system, act virtually on the near- and far-field interface which serves as the truncation limit chosen to carry out the analysis. To satisfy the mentioned boundary condition, the Scaled Boundary Finite Element Method (SBFEM) is chosen for its accuracy andconciseness. The media is inspected assuming compressible and incompressible cases and outputs are compared revealing that the force time history is much bigger for incompressible and clayey cases admitting the liquefaction possibility to exist for incompressible sand. It is observed that the forces, calculated via convolution integrals, vanish rapidly but not immediately after the motion ceases. The interaction-induced excitation may be up to four times the free-field motion

کلمات کلیدی:

Soil-structure interaction, earthquake, scaled boundary FEM, interaction forces,compressible and incompressible conditions

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