

Effect of Soil and Material Characteristics on Safety of Concrete Structures Including SSI

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Abstract : In this parametric study, effect of soil and material characteristics on safety of structures is investigated. The soil parameters such as shear strength, unit weight; geometrical parameters of the structure such as foundation depth and height of building; and material properties such as weight of concrete were selected as input parameters. A real accelerogram of 1989 El-Centro earthquake recorded by the USGS in Imperial Valley is used for this study. It is contained in the standard Strong Motion CD-ROM (SMC) format, which can be recognized and interpreted by FEM software used. The soil-structure interaction model subjected to above-mentioned earthquake was analyzed for 729 cases. Effect of input parameters on safety factor of the soil-structure system was then investigated and the interaction between the input and output parameters is presented in graphical form. Findings showed that all input parameters have significant effects on factor of safety results.

Keywords : factor of safety, finite element method, safety of structures, soil structure interaction

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