

INFLUENCE OF SOIL-STRUCTURE INTERACTION ON THE STRUCTURAL BEHAVIOR OF REINFORCED CONCRETE BUILDINGS WITH BASEMENTS

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ABSTRACT

Many structural projects are modeled considering embedment in the base, which presents certain limitations, since they do not take into account the characteristics and properties of the soil on which the structure is constructed, the characteristics of the foundation, nor the interaction of the soil, foundation and structure, so it does not reflect the actual behavior of the structure as a whole. In this study, an evaluation of the influence of the soil-structure interaction on the behavior of the structure has been carried out, studying the response of the fundamental period, lateral displacement, shear force at the base, turning moment at the base and axial force in the columns of the first floor, for this, 90 structural models have been made, 63 correspond to structural models with a deformable base that include soil-structure interaction and 27 correspond to structural models with a fixed base, of buildings with 10, 15 and 20 floors, with 1, 2 and 3 basements, respectively. The soil was represented by springs of variable stiffness, both with linear and non-linear cases. The models and structural analyzes were carried out using ETABS software. It has been found that the soil-structure interaction influences the response of structures in low buildings more than in tall buildings, therefore, in low buildings it is important to model the structure including the soil-structure interaction.

Keywords: soil-structure interaction, spring stiffness, structural model, seismic analysis.

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