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## LATERAL SEISMIC RESPONSE OF MULTISTORY RCC BUILDING FRAME CONSIDERING STATIC SSI EFFECT

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### ABSTRACT

Soil–Structure Interaction is an important issue in the dynamics of structures, being not taken into consideration, in many cases, due to complex volume of computations. The interaction between soil and foundation becomes meaningful especially in the case of rigid structures and foundations. Soil-structure interaction (SSI) analysis evaluates the collective response and dynamic interplay of three linked systems: the structure, the foundation, and the soil underlying and surrounding the foundation. For the analysis of a building frame, the columns at the foundation level are considered as fixed, but in real condition it is not the case. While considering soil in the analysis of building frame 100% fixity may not be ensured. Because of the settlement and rotation of foundation, shear force and bending moment in superstructure get altered. This effect is called as “Soil Structure Interaction”. This paper studies the effect of soil-structure interaction on the seismic performance of structures taking into account the prevailing uncertainties. The Motivation for this study stems from the significant uncertainty in the earthquake ground motion and in the properties of the soil and the linear behavior of the structure. There two methods for the computation of the flexible base modeling. The first approach is the so-called Direct Approach and second approach is the Sub-Structure Approach. The soil-structure system is modeled by the sub-structure method. There two methods of soil-Structure Interaction 1) Kinematic Interaction 2) Inertial Interaction. For our study we considered Inertial Interaction because it considers the mass of the super-structure and inertial force. In this paper, the interaction between the super-structure and sub-structure is investigated by modeling the soil as linear spring and as discrete support. To illustrate the effects of soil-structure interaction on the seismic response of framed structures, frames (Bare and Infill) with 10 storey have been considered with base supported as fixed with and without considering the soil structure interaction. Influence of soil structure interaction by modeling soil as compression only spring is presented in the form of fundamental period of vibration, base shear, top storey displacement, axial forces and bending moment in column and also the present study focuses on SSI analysis of RC frame shear wall building over fixed and flexible foundation subjected to seismic loading. Multi story buildings symmetric in plan located in various seismic zones and under different types of soils according to IS 1893:2002 are considered.

**KEYWORDS:** Special moment resisting frame (SMRF), Fixed base, Flexible base, Base shear, Period, Displacement, axial forces in column, dual system.