

## **Non-linear soil structure interaction of shear wall system with super element**

### **ABSTRACT**

Shear wall is commonly employed as a principal element to resist lateral loads due to wind or earthquake forces. An accurate model for shear wall system needs to consider the effect of all components for analyses i.e. shear wall, foundation and subsoil. This investigation presents modeling of shear wall structure - foundation and soil system using the super element, finite and infinite elements after considering soil nonlinearity. A finite element program has been written based on the proposed physical and material model for the analysis of the system. The applicability of the proposed idealization has been shown by analyzing a shear wall structure under static loading. In order to explore the efficiency of using super elements, an attempt has also been made to model the shear wall building using fully conventional finite element discretization. Furthermore the paper investigates the necessity of including soil structure interaction in analyzing shear wall structures. The results obtained from the analysis of shear wall model considering five different types of soil for the soil media show that the influence of soil interaction is very significant in the displacement as well as stresses induced in shear wall. Furthermore this investigation highlighted the effect of considering nonlinearity of soil in total displacement and stresses in shear wall system.

**Keyword:** Finite element, Infinite element, nonlinear soil structure interaction, Shear wall building, Super element