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**INFLUENCE OF NUMERICAL PARAMETRIC ON SOIL-
STRUCTURE INTERACTION**

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ABSTRACT

The influence of numerical parametric analysis on soil-structure interaction (SSI) is crucial for understanding and predicting the behavior of structures during seismic events. Numerical parametric analysis involves varying parameters such as soil properties, foundation stiffness, structural mass, and damping characteristics to assess their impact on SSI. These parameters significantly influence the dynamic response of the soil and structure, affecting factors like displacement, acceleration, and internal forces. By systematically altering these variables in numerical models, engineers can gain insights into the complex interactions between the ground and structures, enabling more precise predictions of seismic performance. The choice of soil model, for instance, whether elastic, elastoplastic, or nonlinear, directly affects the accuracy of SSI analysis. Similarly, foundation types (e.g., shallow versus deep foundations) and soil conditions (e.g., soft clay versus dense sand) exhibit distinct behaviors under seismic loading. Numerical parametric studies allow for the optimization of design strategies, such as the implementation of base isolators, modification of foundation systems, or soil stabilization techniques, to enhance earthquake resistance. These analyses also aid in developing performance-based design criteria that account for SSI effects. Consequently, numerical parametric analysis serves as a valuable tool in advancing SSI research, leading to safer and more resilient structural designs.