



Research Article

Non-Uniform Relationship for Soil-Foundation Reaction

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Abstract

This paper presents an exact formula for considering soil stiffness under the foundation. This formula derived from a 3D modeling of eight strip footings with different foundation widths supported on a soil medium. In the case of an earthquake, the behavior of the substructure soil plays an important role in the response of the structure. Studies show that the dynamic response spectrum of a structure on a flexible foundation is different from the response spectrum of a structure on a rigid foundation. Hence it is important to model the soil medium correctly to reach the best seismic results. There are different methods for modeling soil-structure interaction. These models use a constant value for modeling the soil stiffness. However, the soil stiffness varies along the foundation and should be calculated by analytical studies. This paper provides a simple formula which shows a non-uniform soil stiffness under the strip foundation and can be used for practical purposes.

Keywords:

Soil stiffness, Soil-structure interaction, Winkler method, Flexible foundation, Modeling soil-structure interaction

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