Universidad de Lima

Facultad de Ingeniería

Carrera de Ingeniería Civil

ANÁLISIS NUMÉRICO PARAMÉTRICO DE LA CONFIGURACIÓN DE UN GRUPO DE PILOTES CARGADOS LATERALMENTE

Tesis para optar el Título Profesional de Ingeniero Civil

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Análisis Numérico Paramétrico de la Configuración de un Grupo de Pilotes Cargados Lateralmente

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Abstract:

Investigating the behavior of a group of piles under horizontal loads poses considerable engineering challenges. The optimal design of a group of piles involves the number of piles, separation between piles, based on ACI 318-19 standard, pile diameter, and the soil-structure interaction. In this study, a three-dimensional finite element analysis is performed to evaluate the mechanical behavior of a pile group subjected to vertical, horizontal, and bending moment loads in soils. The soil-structure interaction is modeled using the Winkler-Spring methodology in conjunction with the Matlock and Reese method to obtain the moduli of the soil at different depths. The results obtained allow the recognition of new loads acting compared to the model with base restraint; therefore, comparing a specific group configuration to different configurations that allow for more accurate lateral displacements and bearing capacity. The safety factors that guarantee the correct performance of the group of piles based on their configuration are thereby determined.

Keywords: ACI 318-19, Geo5, group of piles, soil-structure interaction, RFEM.

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