A New Approach for Pile- Soil- Pile Interaction under Static Vertical Loading

Piles are normally constructed in groups and close to each other. This causes that piles interact. This paper develops a new approach for determination of interaction factor between closely spaced piles in the group. The segment by segment method (SSM) initially developed by the first author is used to determine load-carrying characteristics of both the “source” (loaded) and the “receiver” (load-free) piles.

The main superiority of the new approach presented in this paper is that the presence of the “receiver” pile is taken into account, unlike other available methods. Moreover, the SSM facilitates to deal with the soil inhomogeneity in the vertical direction. In the SSM, it is assumed that the soil and the pile have linear elastic behavior and no slip occurs between the soil and the pile. The developed method clarifies the shortcoming of existing methods that basically ignores the presence of the “receiver” pile.

Parametric studies have been performed, showing the capability of the method based on its simplicity and also efficiency in calculating the static vertical interaction factors in inhomogenous soils without limitation in number of soil layers.

Keywords: Pile groups, pile-soil-pile-interaction, linear elastic, soil inhomogeneity, axial load

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