

Numerical Investigations on Group Piles' Lateral Bearing Capacity Considering Interaction of Soil and Structure

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Abstract : In this research, the behavior of monopiles, under lateral loads, was investigated with vertical and oblique piles by Finite Element Method. In engineering practice when soil-pile interaction comes to the picture some simplifications are applied to reduce the design time. As a simplified replacement of soil and pile interaction analysis, pile could be replaced by a column. The height of the column would be equal to the free length of the pile plus a portion of the embedded length of it. One of the important factors studied in this study was that columns with an equivalent length (free length plus a part of buried depth) could be used instead of soil and pile modeling. The results of the analysis show that the more internal friction angle of the soil increases, the more the bearing capacity of the soil is achieved. This additional length is 6 to 11 times of the pile diameter in dense soil although in loose sandy soil this range might increase.

Keywords : Depth of fixity, Lateral bearing capacity, Oblique pile, Pile group, Soil-structure interaction

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