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Development Bearing Capacity of Piles Embedded in Clayey Soil

Abstract- *The load carrying capacity of piles resulting from base resistance and shaft resistance, the load transfer mechanism of piles is complicated since the mode of failure of these components is different in addition to the effect of pile installation on the soil surrounding of piles .The intended task of this paper is studying the behavior of pile group model driven in clayey soil subjected to vertical axial loading, and the assessment of the development of resistance of each of the two components, tip resistance and skin friction of the piles of during loading. Twelve piles group tests are conducted at three grades of undrained shear strength (cu) of clayey soil which are (20 or 40 or 60 kPa) where the configuration of the pile groups used in all tests is (2 x 2). Two different pile lengths (L) are selected (300 and 450 mm), these lengths represent the slenderness ratio (L/D) of (10) and (15) respectively, so that the center to center spacing between the piles (Sp) used are (3D) and (5D). It was observed that the most of the load capacity of piles is mobilized at settlement of around (1 – 2 mm), corresponding to (5 %) of pile diameter (D) , however, the development of full shaft resistance of piles appears at a low displacement range and is only of about (1 to 2 %) of the pile diameter while the pile end bearing will mobilize at a higher displacement range in the range of (5 to 10%).The changing of undrained shear strength of clay from (20 to 60 kPa) has no significant effect on the load transfer mechanism and the mobilization of shaft resistance and end bearing with increasing the settlement. It was concluded that a low ratio load sharing of piles tip, especially with increasing slenderness ratio (L/D) , which supports the fact that the piles in the weak clayey soils behave as a floating pile which leads to neglecting end bearing capacity in calculating the total pile load capacity as indicated by some references.*

Keywords- *model piles test, end bearing, skin friction, clay.*

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