

S Y N O P S I S

This study reports experimental model investigation of the behavioural characteristics of pile groups subjected to vertical and lateral loads. The tests were performed on a single pile as well as on groups with pile numbers varying from 2 to 9 in different arrangements. All the tests were performed in clean, loose to dense dry sand of uniformity coefficient 1.1. Aluminium alloy tubes were used as model piles. Surface strain measurements along the embedded lengths of the piles were done with the help of strain gauges. The large number of experimental data obtained from various tests were processed on IBM-1620 digital computer.

Soil modulus along the depth of the pile under different densities was studied and it is found that its variation with depth can be expressed in the form of $k_x = cx^n$ where the exponent n is found to be approximately equal to 0.7 for all piles. The soil density does not seem to have any significant influence on the exponent n .

The relative stiffness factors of individual piles in the groups have been reported and their relationships with those of a single pile are represented in graphical forms.

Plots of non-dimensional coefficients have been developed for prediction of deflection, rotation, moment, shear and soil reaction along the depth of a pile for applied lateral load and moment at the ground surface.

Expressions for the pile constants of a single pile have been determined and relationships of pile constants for the individual piles in a group in terms of single pile values have been presented in graphical plots taking into account of the group action and the influence of vertical and lateral loads.

The distributions of load along with the deformation characteristics have been reported and an attempt has been made to predict the behavioural characteristics of an individual pile in the group from those of a single pile tested under lateral load and in direct compression.