


| University of Baghdad |   |
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| Thesis Title          | Response of Pile Groups Subjected to Torsion  |
| Year                  | 2014  |
| Abstract              | <p>The present study investigates the behavior of pile groups subjected to eccentric lateral loads in sandy soil. Special setup was manufactured to perform the experimental program of this research study.</p> <p>The testing program consists of three parts: first part includes two groups, The first group consists of 3 circular piles connected with Aluminum pile cap of (11.5×11.5×3 cm) while the second group consists of 5 circular piles connected with pile cap of the same dimensions of that used in the first one. The pile is modeled as Aluminum closed end tube with (15 mm) outer diameter and (2mm) thickness, the end of pile is closed. Four percentages of allowable vertical load were used (0%, 25%, 50%, and 100%) with two L/D (length of pile/diameter of pile) ratios 20 and 30. The eccentric lateral load was applied at the corner of the pile cap. The second and third parts include the two groups that were used in the first part with the same L/D ratio, two percentages of allowable vertical load were used (0% and 100%), the effect of direction of the eccentric lateral load was studied in the second part while the effect of location of the eccentric lateral load was studied in the third part. The effect of percentage of allowable vertical load, L/D ratio, number of piles, direction and location of torsion load was investigated.</p> <p>The obtained results indicate that the torsional capacity for pile group increases with increasing the percentage of allowable vertical load, when the percentage of allowable vertical load was 100% and L/D ratio (20) the torsional capacity for pile group PG3 and PG5 increases about 42%and 53% respectively compared with the torsional capacity when the percentage of allowable vertical load was 0%. Also increasing L/D ratio leads to increasing the torsional capacity of pile group, when the percentage of allowable vertical load is 100% and L/D ratio (30), the torsional capacity for pile group PG3 and PG5 increased about 51% and 66% respectively if compared with torsional capacity when L/D ratio was (20) for the same groups and the same percentage of allowable vertical load.</p> <p>Increasing number of piles lead to increase the torsional capacity of pile group, when L/D ratio is (20) and the percentage of allowable vertical load is 100% the torsional capacity for pile group PG5 increases about 86% if compared with the torsional capacity for the pile group PG3 for the same percentage of allowable load and L/D ratio.</p> <p>The direction and position of the eccentric lateral load have also an effect on the torsional capacity of pile group, this change in the torsional capacity of pile group depends on the pattern of pile group and distribution of load on piles, whenever torsion load approaches from center of pile cap, the torsional capacity increases and the torsion load away from center of the pile cap</p> |

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|  | <p>the torsional capacity decreasing.</p> <p>The increase in the torsional capacity of pile group does to decrease the twist angle for pile group, the maximum magnitude of twist angle arrived at failure in all tests is</p> |  |
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