Optimum Design of Piled-Raft Systems

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Abstract : This paper presents a study of the problem of the optimum design of piled-raft foundation systems. The study has been carried out using a hypothetic problem and soil investigations of six sites locations in Basrah city to evaluate the adequacy of using the piled-raft foundation concept. Three dimensional finite element analysis method has been used, to perform the structural analysis. The problem is optimized using Hooke and Jeeves method with the total weight of the foundation as objective function and each of raft thickness, piles length, number of piles and piles diameter as design variables. It is found that the total and differential settlement decreases with increasing the raft thickness, the number of piles, the piles length, and the piles diameter. Finally parametric study for load values, load type and raft dimensions have been studied and the results have been discussed.