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Scale model to measure stress under circular footings resting on sand

Abstract

This paper presents the results of a series of load tests carried out with a foundation model supported by sand. The aim of this study is to measure the stresses in the soil that occur when applying loads with a circular foundation model. Sand was placed in a circular tank of 60 cm in diameter and 45 cm in height. Diaphragm load cells were used to measure the stresses. It was used to determine the effect of the relative density in the vertical distribution of stresses in the sand. The stresses measured with the load cells were compared with those estimated with the Boussinesq's method and were validated using a finite element model. The results showed that the inclusion of cells in the soil produced an alteration in the stress–settlement behaviour of circular footing resting on sand. Boussinesq's method presented an acceptable approximation to the stresses measured with the load cells.