

Abstract

Provided doctoral dissertation presents a method of vertical stress skin resistance formation estimation with shortening pile effect included. After presenting the literature overview by Author, there was presented an analysis of the phenomena and mathematical calculations and relationships between the vertical stress and depth with the parameter defining material properties. The mathematical apparatus and scheme of vertical stress formation is based upon Meyer-Kowalow method, and most important Kirchhoff law. After presentation of the final version of the mathematical equation, which was the input to the further work in analysis, Author presented the database with which he worked through the dissertation.

Analysis was based upon two piles, numbered 1 and 2 from the literature [42], as well as for piles numbered 3, 4, 5, 6 which were provided by external source. The field experimental tests were static load tests for all analyzed cases with extensometers equipped additionally to provide the distribution of the vertical stress skin resistance for each pile.

Further there was verification made for the mathematical apparatus presented earlier using the least squares method and the results obtained from static load tests. After verification and initial summary of obtained results, there was unusual case presented. For one of the piles from database, the stress started forming on the base of the pile and happened to appear along the whole shaft with the increase of the vertical load put to the head of the pile. For this case, there was additional mathematical apparatus presented, that allowed to obtain the skin resistance values along the whole shaft, which was not possible with the formerly presented method.

To finish the dissertation Author provided the conclusions for the whole work, assumed the thesis was proven and presented the plans for further work upon presented phenomena in dissertation.

21.05.2021
Pawlica