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Eyubhan Avcı¹ Eray Yıldırım²

EXAMINATION OF UNCONFINED COMPRESSIVE STRENGHT VALUES BY RESPONSE SURFACE MODELS IN GROUTED SANDS WITH MICROFINE CEMENTS

Summary:

The aim of this study is to investigate the relationship between unconfined compressive strength values and fine sand percentage, water/cement ratio, cement size, relative density and grouting pressure values in sands grouted with microfine cement through response surface models. Unconfined compressive strength values of 427 sand samples which were successful in grouting experiments were determined and response surface models were established with the determined variables. Fine sand percentage, water/cement ratio, cement size, relative density, injection pressure values and unconfined compressive strength values were used while creating response surface models. The response surface models used in the study are multivariate polynomial models and are used to optimize the results and determine the variables used in the design. In this study, a total of 4 response surface models known as Linear, Interactions, Pure Quadratic and Full Quadratic, were used. For each model, coefficients, confidence limits, and root mean square error (RMSE) values were measured and compared. Using the response surface models, prediction models for the unconfined compressive strength were developed.

Key words:

response surface methods; unconfined compressive strength; fine sand content; relative density; water/cement

¹Dr.Eyubhan Avcı, civil eng.geotechnics,Bursa Technical University, Faculty of Engineering and Science, Civil Engineering, Yıldırım, Bursa, Turkey, eyubhanavci@gmail.com

²Dr.Eray Yıldırım, civil eng.geotechnics, Bursa Technical University, Faculty of Engineering and Science, Civil Engineering, Yıldırım, Bursa, Turkey, eray.yildirim@btu.edu.tr