

## **A Statistical Model for the Geotechnical Parameters of Cement-Stabilised Hightown's Soft Soil: A Case Study of Liverpool, UK**

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**Abstract :** This study investigates the effect of two important parameters (length of curing period and percentage of the added binder) on the strength of soil treated with OPC. An intermediate plasticity silty clayey soil with medium organic content was used in this study. This soft soil was treated with different percentages of a commercially available cement type 32.5-N. laboratory experiments were carried out on the soil treated with 0, 1.5, 3, 6, 9, and 12% OPC by the dry weight to determine the effect of OPC on the compaction parameters, consistency limits, and the compressive strength. Unconfined compressive strength (UCS) test was carried out on cement-treated specimens after exposing them to different curing periods (1, 3, 7, 14, 28, and 90 days). The results of UCS test were used to develop a non-linear multi-regression model to find the relationship between the predicted and the measured maximum compressive strength of the treated soil ( $q_u$ ). The results indicated that there was a significant improvement in the index of plasticity (IP) by treating with OPC; IP was decreased from 20.2 to 14.1 by using 12% of OPC; this percentage was enough to increase the UCS of the treated soil up to 1362 kPa after 90 days of curing. With respect to the statistical model of the predicted  $q_u$ , the results showed that the regression coefficients ( $R^2$ ) was equal to 0.8534 which indicates a good reproducibility for the constructed model.

**Keywords :** cement admixtures, soft soil stabilisation, geotechnical parameters, multi-regression model

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