**A Model for Predicting the Bearing Capacity of the Soil-Cement Columns Using the Soil Resistivity**

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**Abstract.** Soil-Cement Column (SCC) is a semi-rigid structure of which quality could not be thoroughly assessed by non-destructive tests such as Impact Echo, Impulse Response, Impedance Log, Parallel Seismic, etc. Unlike concrete piles as rigid structures, the problem of SCC is due to its relatively low stiffness and inhomogeneity. The reason in the process of mixing at the site, re-using the in-situ disturbed soil, and conducting to the deep zones of the soil stratum, the product faces so many risks of questionable quality. Because the structure is semi-rigid, the method of using electrical resistivity (ER) in geophysics is suggested. This article deals with an experimental model in which an axisymmetry SCC with a sufficiently wide soil medium is created for measuring the ER, having electric probes installed as per the Wenner’s configuration. By tracing the change of electric resistivity (ER) within the structure having different stiffness, and comparing the ER map to the homogeneous soil of the medium, the change in mechanic properties of the structure is predicted. The bearing capacity of the structure could be then estimated by applying formulas in traditional calculations. The results calculated would be compared to those predicted by an artificial neural network (ANN) with a deliberately limited amount of input data (i.e, frequencies and mode shapes). Some statistical measures such as cross-validation analysis (CVA), mean square error (MSE), and multi-regression analysis, etc., would be applied to validate the predicted results.

**Keywords:** Soil-cement Column, Wenner’s Test, Electric Resistivity, Artificial Neural Network, Multi-regression analysis