

## Stiffness and Modulus of Subgrade Reaction of the Soft Soil Improved by Stone Columns

**Authors :** Sudheer Kumar J., Sudhanshu Sharma

**Abstract :** Stone columns are extensively used as constructive and environmentally sustainable improvement methods for improving stiffness, modulus of subgrade reaction, and maximum lateral displacement in the multilayer soil system. The advantage of using stone columns in improving the single-layer soft soil as a ground reinforcement element for supporting various structures up to shallow depth is well researched, but the understanding of strengthening the multiplayer soil system for a deeper level requires further studies. In this paper, a series of cases have been conducted to study the behaviour of ordinary stone columns (OSC), geosynthetic encased stone columns (GESC) over various objectives for strengthening multilayer soil system up to deep level. A finite element analyses were carried out using the software package PLAXIS to study further correlate the results. The study aims to find the stiffness of composite soil, modulus of subgrade reaction, which is generally required for designing of various foundations, and also discusses the maximum horizontal displacement location, which is the major failure criteria seen after the installation of stone columns.

**Keywords :** stone columns, geotextile, finite element method, stiffness, modulus of subgrade reaction, maximum lateral displacement point

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