

## Numerical Analysis of Geosynthetic-Encased Stone Columns under Laterally Loads

**Authors :** R. Ziaie Moayed, M. Hossein Zade

**Abstract :** Out of all methods for ground improvement, stone column became more popular these days due to its simple construction and economic consideration. Installation of stone column especially in loose fine graded soil causes increasing in load bearing capacity and settlement reduction. Encased granular stone columns (EGCs) are commonly subjected to vertical load. However, they may also be subjected to significant amount of shear loading. In this study, three-dimensional finite element (FE) analyses were conducted to estimate the shear load capacity of EGCs in sandy soil. Two types of different cases, stone column and geosynthetic encased stone column were studied at different normal pressures varying from 15 kPa to 75 kPa. Also, the effect of diameter in two cases was considered. A close agreement between the experimental and numerical curves of shear stress - horizontal displacement trend line is observed. The obtained result showed that, by increasing the normal pressure and diameter of stone column, higher shear strength is mobilized by soil; however, in the case of encased stone column, increasing the diameter had more dominated effect in mobilized shear strength.

**Keywords :** encased stone column, laterally load, ordinary stone column, validation

**Conference Title :** ICSR2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020