

Precast stabilized peat columns to reinforce peat soil deposits.

ABSTRACT

This article describes laboratory research on precast columns made of peat soil and ordinary Portland cement, with and without polypropylene fibers. The columns used in this study unlike the usual in situ or in place columns used previously, that are formed inside prepared holes in the ground, are formed outside the hole, and then inserted into the ground holes. The process of making precast stabilized peat columns includes mixing peat soil with a specified amount of cement, (with or without polypropylene fibers) at their optimum moisture (found from compaction tests) contents. The mixture is then compacted into molds and left to dry. As the stabilized columns dry out, they gain strength. When drying is complete, they are taken out of their molds and inserted in the pre-drilled holes. In this laboratory study, long precast columns ($L/D > 4$) were used to reinforce undisturbed peat soil samples. The strength evaluation for the precast stabilized columns was done through consolidated undrained triaxial tests. The undisturbed peat soil in the study has been used as control sample. The results of the study obtained from shear strength parameters, stress-strain curves and undrained modulus prove that precast stabilized peat columns can be used to reinforce and strengthen weak deposits of peat soil. Their production requires relatively small amounts of cement compared with the usual in situ columns but provides higher strength values, and therefore provides more load-bearing capacity. Since the production process does not waste much of the materials involved and does not use any fill materials the columns can also be considered environmentally friendly.

Keyword: Undisturbed peat samples; Precast stabilized peat columns; Compaction; Consolidated undrained; Principal stresses; Shear strength parameters; Undrained modulus.