Effect of Polypropylene Fiber and Polyvinyl Alcohol Resin on Engineering Properties of Silty-Sand Soils

With the reduction of available land resources, more and more construction of civil engineering structures is carried out over weak or soft soil, which leads to the establishment and development of various ground improvement techniques such as soil stabilization and reinforcement. Several reinforcement methods are available for stabilizing expansive soils. These methods comprise stabilization with chemical additives, rewetting, soil replacement, compaction control, moisture control, surcharge loading, and thermal methods. Recently, for a second time, one of the early methods has been introduced to civil projects, i.e. random fiber reinforcement.

However, very limited information has been reported on the use of randomly distributed discrete fibers for soil reinforcement. In this paper, a novel method of soil reinforcement using a mixture of discrete polypropylene (PP) fibers with polyvinyl Alcohol (PVA) was introduced. Fibers can perform superior at fully wet conditions in soil compared to ordinary chemical resins. That is why the combination of PP fiber and PVA resin was used in this study. For this purpose, four percentages of PP fibers (12 mm length) including 1%, 10% and 10% were mixed with 0% and/or 5% PVA to prepare different treatments. CBR test at both dry and soaked methods was chosen to evaluate the compressive behavior of soil composites. The results showed that the combination of 1% PP fibers with 5% PVA resin presents the best CBR values at both dry and saturated conditions compared to resin modified and/or fiber reinforced soil samples.

Keywords:
این صفحه به معنای تاییدیه نمایه سازی مقاله در پایگاه استادی سیویلیکا می‌باشد. در هر لحظه به منظور تایید اصلاحات این گواهی می‌توانید وضعیت ثبت مقاله را از طریق لینک فوق به صورت آنلاین کنترل نمایید.