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Reinforcement of sand by plastic fibers

Ari Ali.

Building construction Eng. Iraq

Soil reinforcement is an efficient mechanical technique for soil stabilization. Soil reinforcement can be achieved by the inclusion of continuous strips or sheets within the soil mass (systematically reinforced soil) or by the inclusion of short discrete randomly distributed fibers. The initial stage of the experimental program includes the study of the effect of plastic fiber (as reinforcement material) with different size and contents. In this experimental study, raw plastic bottle fibers has been used in two different aspect ratio i.e. (size=1mm*12mm), (size=1mm*6mm) these different size of plastic fiber have been mixed with sand. The results provide that there is an increase in shear strength due to the fiber reinforcement. The initial value of shear strength developed from the results of shear strength was found to be increase after reinforced with fiber. Systematic reinforcement improves the strength in certain directions. Randomly distributed reinforcement, on the other side, provides an isotropic behavior and limits the development of weak plans. Reinforced sand construction is an efficient and reliable technique for improving the strength and stability of sands. The technique is used in a variety of applications, ranging from retaining structures and embankments to subgrade stabilization under footing and pavements. We can say that the waste plastic bottles can be successfully recycled to produce plastic-fibers that can be used to improve the strength of weak soils. The addition of plastic-fibers to the sand samples resulted in substantial increase in the measured values of the cohesion and friction angle.

ari_civil_91@hotmail.com