



An investigation into the shear strength of sandy soil stabilized by casein biopolymer and polypropylene fibers

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Abstract

Uniform sandy soils due to their lack of cohesion and low compressibility are frequently regarded as problematic soils for construction purposes. Thus, it is usually required to employ appropriate methods for improving the soil properties. In this study, a series of laboratory experiments were conducted to investigate the effect of sodium caseinate resin and polypropylene fibers on mechanical properties of sandy soils. Sodium casheinate is a proteinaceous substance derived from casein derivatives obtained from milks and it is known for being environmentally friendly and may be used as an appropriate soil stabilizer. Polypropylene fibers were used for soil reinforcement due to their tensile properties. In this Research 1% resin and polypropylene fibers of 12 mm in length at content of (0, 0.05%, 0.1%, and 0.15%) have been added to casein modified soil. The main objective of the study is to improve the properties of sandy soils, particularly their strength. For this purpose, direct shear test with 3-day treating time has been used.

Key words: sodium caseinate resin, polypropylene fibers, reinforced sandy soils, shear strength

1. Introduction

Loose uniform sandy soils due to their weak structure and instability are considered as problematic soils. On the other hands, considering that a large part of Iran consist of desert area covered with sandy soils, so encountering of such soils in construction projects are inevitable. Therefore, finding suitable methods for improving soil resistance parameters are very important.