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Influence of Nanozeolite Particles on Improvement of Clayey Soil

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Abstract : The problem of soil stabilization has been one of the important issues in geotechnical engineering. Nowadays, nanomaterials have revolutionized many industries. In this research, improvement of the Kerman fine-grained soil by nanozeolite and nanobentonite additives separately has been investigated using Atterberg Limits and unconfined compression test. In unconfined compression test, the samples were prepared with 3, 5 and 7% nano additives, with 1, 7 and 28 days curing time with strain control method. Finally, the effect of different percentages of nanozeolite and nanobentonite on the geotechnical behavior and characteristics of Kerman fine-grained soil was investigated. The results showed that with increasing the amount of nanozeolite and also nanobentonite to fine-grained soil, the soil exhibits more compression strength. So that by adding 7% nanozeolite and nanobentonite with 1 day curing, the unconfined compression strength is 1.18 and 2.1 times higher than the unstabilized soil. In addition, the failure strain decreases in samples containing nanozeolite, whereas it increases in the presence of nanobentonite. Increasing the percentage of nanozeolite and nanobentonite also increased the elasticity modulus of soil.

Keywords : nanoparticles, soil improvement, clayey soil, unconfined compression stress
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