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Laboratory Study of Reinforce Slop Behavior in Unsaturated Conditions

Construction of road foundations or embankments on soft soil bed, due to bearing capacity, usually causes bed rupture with high subsidence. Soil reinforcement using geocell has been proposed by various researchers as a suitable solution. In the present study, experiments have been performed to investigate the behavior of armed slopes by changing the geocell position as well as the change in the percentage of soil moisture. A total of seven laboratory samples were designed and built, and the test program was designed according to two variables. These two variables are reinforcement (geocell) and moisture content. For moisture content, the values of 10%, 15%, and 20% were considered, and the geocell was examined in both the middle, and end modes of the work. The results show the positive performance of Geocell in increasing shear strength, load-bearing and flexural strength, and finally reducing displacement and increasing gable stability. The positive effect of geocell presence can be expressed according to the triple action mechanism of geocell in the reinforced soil mass. The results show that with increasing soil suction with the location of the geocell layer is constant, the displacement changes are reduced by about thirty percent, but by changing the location of the geocell layer ($u/h=1$ to $u/h=0.5$) in constant moisture, the amount decreases. Settlement and displacement is about fifteen percent.

Keywords: Unsaturated soil, slop, geocell, physical model.

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