

Sand Dunes Stabilization Using Silica Gel and Cement kiln Dust

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Abstract

This research includes the study of adding some available cheap and Local materials to Sand Dunes (SD) such as, Silica Gel (SG) and Cement kiln Dust (CKD) which are used as stabilizers and sand improvement . The Laboratory tests out on (June 2013 to November 2013 .) Some Physical and chemical characteristics of(SD),(SG) and (CKD) were obtained, also Grain Size Distribution(GSD) and chemical composition were obtained. The program was divided into two stages the first one includes preparing four mixtures three of them Silica gel were added to tape water to make solution (2.5%,5% and 7.5%) , then adding to the sand dunes, which is denoted by (m1, m2 and m3) respectively , the fourth mixture represent reference(sand dunes) ,these mixtures aging for (7, 14 and 28) days. Pure sand dunes and these three mixtures were tested to determine the wind velocity effects on drifting sand, shear strength force, cohesion and penetration .The second stage includes determining the best results of three previous mixtures, which called typical mixture, and (2.5%,5% and 7.5%) of CKD were added to the typical mixture, which is denoted by (m41, m42 and m43) respectively , these mixtures aging- curing period- for (7, 14 and 28) days. Generally, this study showed significant improvement in the performance of sand dunes by using Silica Gel and Cement Kiln Dust, which means that, they can be used as stabilizer and soil improvement as economic and available materials .