

Experimental Study of the Fine-Grained Earthen Bed Stabilization Using Nanoclay

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Abstract

Transporting borrow materials for proper infrastructure of water channels to bear the load of such structures is important in the development plans. Therefore, in this research clay nanocomposite material with a weight ratio of %1 was added to the soil. Soil sample was taken from the bed of the C₂₅ canal (tributary of GanjAfrooz diversion dam within Alborz project area) at various intervals and the depth of 1 meter. Unconfined compression strength and consolidation tests were performed on the selected soil. The results showed that the addition of nanoclay to the soil increased the rate of shear resistance, cohesion property and compressibility of soil, respectively, equal to 14.13, 14.13 and 82.76 percent. Also, angle of failure and ultimate void ratio decreased. As a result, the addition of nanoclay to the soil makes soil strength and stability greater and there are no problems caused by bed erosion and transporting of borrow material for infrastructure of channel.

Keywords: Soil Stability, Consolidation, Erosion, Compression Strength, Nanoclay.

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