PONTE

Vol. 76 No. 2, 2020 Florence, Italy
*ISSN:*0032-423X*E-ISSN:*0032-6356 International Journal of Sciences and Research

DOI: 10.21513/j.ponte.2020.06.11

EFFECT OF DUNE SAND AND LIME ON THE STABILISATION OF SWELLING SOILS. CASE OF CLAYS IN THE ADRAR REGION (ALGERIA)

Khedidja Belaidi[a], Mohamed Amine Allal[a,] Belkacem Mekerta[b] & Mohamed Benabdelfattah[b]
[a]University of Tlemcen, BP 230, 13000Tlemcen, **ALGÉRIA**
EOLELaboratory (Eau et Ouvrage dans Leur Environnement)
[b] Ahmed Draia University, 01000 Adrar, **ALGÉRIA**
khadidja.univ@yahoo.fr / khedidja.belaidi@univ-adrar.dz

ABSTRACT

This article presents a series of laboratory tests intended to assess the effect of dune sand and lime on characteristics, such as compaction, free swelling, swelling pressure and hydraulic conductivity, of swelling clay from the region of Adrar(Algeria). The oedometer tests were carried out at different rates of sand and lime, between 2 and 12%, separately, in order to design engineered barriers meant for the realization of the bottom walls of waste disposal facilities. The results obtained showed an increase in the maximum dry density and a decrease in water content (Optimum Proctor characteristics) as the percentage of dune sand in the clay under study varied. However, for the same percentages of clay and lime, the results obtained indicated a decrease in the maximum dry density and an increase in water content (Optimum Proctor) according to the percentage of lime incorporated in clay. In addition, this article focused on the study of free swelling of the same mixtures of clay with the same percentages of sand and lime. Moreover, the evolution of the swelling pressure and hydraulic conductivity ofthe mixture of clay plus limewas also studied. The purpose of the present study is to develop and validate a local, low-cost and high-quality material that meets the Algerian regulations in force regarding the design of watertight barriers of waste disposal centers.

Keywords: Dune sand, lime, clay, hydraulic conductivity, passive barrier.