

Characterization and chemical stabilization of Al-Qurayyah sabkha soil

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Abstract: Sabkha soils are known for their low-bearing strength in their natural condition. Moreover, the collapse potential of sabkhas presents an unacceptable risk in normal practice and calls for the improvement of their mechanical properties prior to any construction. A review of the literature indicates that research on the stabilization of sabkha is scanty despite the extensive distribution of sabkha soils worldwide. Moreover, since the sabkha is a highly variable material, there is a need to formulate a "data bank" by stabilizing as many sabkhas as possible. In this study, a "selected" sabkha soil from Al-Qurayyah, eastern Saudi Arabia, was researched for improving its properties using cement and lime at five different dosages ranging from 0 to 10%. The load-bearing capability of plain and chemically stabilized sabkha mixtures was evaluated using the CBR, unconfined compressive strength, and Clegg impact value at different moisture contents. The results indicated that cement improved the performance of stabilized sabkha much more than lime, particularly at high moisture contents. Further, the 7% cement addition has satisfied the strength requirements so that sabkha soil can be used as a base course in rigid pavements and a subbase in flexible pavements.