

Study on Strength Characteristics of Rice Straw Fiber-Cement-Reinforced Sludge

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In Japan, "Fiber-cement-stabilized soils method" (FCSS) has studied and applied to recycle dredging sludge from rivers and canals. The method mixed paper fragment and cement into the dredging sludge. The modified-sludge showed some advantages, such as high strength, high durability, friendly environment, and inexpensive. In this paper, FCSS is applied to recycle dredging sludge in Vietnamese Mekong delta. Nevertheless, the cost of paper fragment is becoming too high and also it is difficult to obtain in the delta. Local fiber is strongly desired in order to reduce the recycling fee. Therefore, rice straw is utilized due to its plenty and wasteful amount in Vietnamese Mekong delta. If the paper fragment can be replaced by the rice straw as fiber material, the modified-sludge will be promising able to recycle by FCSS. In this study, unconfined compression tests were carried out to investigate the strength and strain characteristics of the rice straw fiber-cement-reinforced sludge. The results indicated that the rice straw could be used instead of paper fragment in FCSS with high mechanical performances. Moreover, empirical functions were obtained to predict the optimum values for rice straw content and cement content.

Keywords : Sludge, Rice straw fiber, Unconfined compression test, Optimum functions