

Experimental study on engineering characteristic of alkali-activated slag - bentonite backfills for vertical slurry cutoff wall

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In this study, alkali-activated slag and bentonite (GMB) are mixed and used to form backfills for vertical slurry cutoff wall. For the purpose of redevelopment and utilization of contaminated site, engineering characteristic of GMB backfill has been research. The slump tests, unconfined compressive strength test, direct shear test and permeability test have been conducted under different content of sand-soil ratio, MgO-activated slag, bentonite and different curing time. The slump test results show that standard slump of GMB backfill is well liner to mini slump. It is found that the values of mini slump are 25.5 to 75.5 mm when the GMB backfill meet the workability of construction. The Unconfined compressive strength test show that, the q_u of GMB specimens are increased with the curing time and content of MgO-activated slag, and the content of bentonite is weakly influence the q_u . The direct shear test show that, the cohesive force of GMB specimens are increasing remarkably when the curing time from 14 d to 28d and the content of MgO-activated slag increased from 5% to 15%. Moreover, the ratio of sand-soil decreased result in cohesive force increasing. The friction of GMB specimens increased with the content of MgO-activated slag and sand-soil ratio, however, it would be decreased slightly with curing time and the content of bentonite. In the last, the permeability result of GMB show that the GMB has a significant effective on cutoff groundwater flow and it can reach the permeability of 1×10^{-7} to 1×10^{-9} m/s.

Keywords: alkali-activated slag, bentonite, engineering characteristic, cutoff walls