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Filling material for a buried cavity in a collapse area using light-weighted foam and active feldspar

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Concrete which is generally used as filling material for a buried cavity has very high strength but significantly high self-load is considered its disadvantage. If it is used as filling material, the second collapse due to additional load, causing irreversible damage. If light-weighted foam and active feldspar are used to solve this problem, the second collapse can be prevented by reducing of self-load of filling material.

In this study, the specimen was produced by mixing light-weighted foam, active feldspar and cement, and changes in the density, unconfined compressive strength and hydraulic conductivity were analyzed. Using the light-weighted foam could enable the adjustment of density of specimen between 0.5 g/cm3 and 1.7 g/cm3, and if the mixing ratio of the light-weighted foam increases, the specimen has more pores and smaller range of cross-sectional area. It is confirmed that it has direct correlation with the density, and if the specimen has more pores, the density of the specimen is lowered. The density of the specimen influences the unconfined compressive strength and the hydraulic conductivity, and it was also confirmed that the unconfined compressive strength could be adjusted between 0.6 MPa and 8 MPa and the hydraulic conductivity could be adjusted between 10^{-9}cm/sec and 10^{-3}cm/sec. These results indicated that we can adjust unconfined compressive strength and hydraulic conductivity of filling materials by changing the mixing amount of lightweight-weighted foam according to the requirements of the field condition.

Keywords: filling material, buried cavity, light-weighted foam, feldspar

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