

# A study of Dynamic Properties of Recycled Granite Residual Soils with New Polymer SH

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## Abstract

Improving and reusing construction waste soils is now more relevant in light of the need to decrease CO<sub>2</sub> emissions. In this paper, four contents of polymer SH (i.e., 0.0%, 3.0%, 3.5%, and 4.0%) were used to strengthen the granite residual soils, which is a kind of construction waste soils. Based on low-velocity impacts and employing scanning electron microscope (SEM) tests, this paper investigated the impact resistance of reinforced granite residual soils combined with polymer SH. Recycling waste granite residual soils can reduce the emissions of CO<sub>2</sub> generated during the transportation and disposal. The low-velocity impact tests were performed on specimens at three initial kinetic energy levels (i.e., 124.18J, 243.40J, and 402.36J) achieved by varying the drop height of the weights. The experimental results showed that the impact resistances of granite residual soils were enhanced significantly with a mixture of polymer SH, for which the increment reached the maximum with a 3.5% content of polymer SH. In addition, the microstructures of granite residual soils combined with four contents of polymer SH (i.e., 0.0%, 3.0%, 3.5%, and 4.0%) were investigated using a Scanning Electron Microscope (SEM). The SEM images demonstrated that the interfaces of the granite residual soils particles became less distinct due to cementation with the increasing of the polymer SH content. With the optimal polymer SH content of 3.5%, the pore of granite residual soil was the smallest, resulting in a best enhancement of the impact resistance of the reinforced granite residual soil.

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