

A Review on New Additives in Deep Soil Mixing Method

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Abstract : Considering the population growth and the needs of society, the improvement of problematic soils and the study of the application of different improvement methods have been considered. One of these methods is deep soil mixing, which has been developed in the past decade, especially in soft soils due to economic efficiency, simple implementation, and other benefits. The use of cement is criticized for its cost and the damaging environmental effects, so these factors lead us to use other additives along with cement in the deep soil mixing. Additives that are used today include fly ash, blast-furnace slag, glass powder, and potassium hydroxide. The present study provides a literature review on the application of different additives in deep soil mixing so that the best additives can be introduced from strength, economic, environmental and other perspectives. The results show that by replacing fly ash and slag with about 40 to 50% of cement, not only economic and environmental benefits but also a long-term strength comparable to cement would be achieved. The use of glass powder, especially in 3% mixing, results in desirable strength. In addition to the other benefits of these additives, potassium hydroxide can also be transported over longer distances, leading to wider soil improvement. Finally, this paper suggests further studies in terms of using other additives such as nanomaterials and zeolite, with different ratios, in different conditions and soils (silty sand, clayey sand, carbonate sand, sandy clay and etc.) in the deep mixing method.

Keywords : deep soil mix, soil stabilization, fly ash, ground improvement

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