Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

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FREEZING-THAWING BEHAVIOR OF CLAYEY SOILS REINFORCED WITH PINE TREE SAWDUST AND MARBLE DUST

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Abstract

In this study, the change of freeze-thaw test result of unconfined compressive strength of clayey soils reinforced with pine tree sawdust and marble dust was investigated. Mixtures containing 5%, 10% and 15% marble dust and 0.5%, 1% and 1.5% pine tree sawdust were compressed by standard Proctor test with optimum moisture content. After curing the mixture samples for 1, 7 and 28 days at a working room temperature of +21°C, they were subjected to the freeze-thaw test at -21°C, +21°C for 12 hours and 12 cycles. In the test results of the unconfined compressive strength test applied to the samples, the highest strength increase was determined in clayey soil+%15 marble dust+1% pine tree sawdust mixtures before and after freezing thawing. The strength increases before and after freeze-thaw was 54.80% and 31.56%, respectively. According to SEM analyses, structural changes in clayey soil reinforced with pine tree sawdust and marble dust were examined before and after freeze-thaw. It has been determined that the mixture of pine tree sawdust and marble dust can be applied in the treatment of clayey soils.

Key words: clay, freeze-thaw, marble dust, pine tree, strength

Received: February, 2020; Revised final: May, 2020; Accepted: June, 2020

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