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IMPACTS OF FREEZING-THAWING AND WETTING-DRYING CYCLES ON A SILT STABILIZED BY LIME AND WASTE SILICA

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Abstract

The main objective of this research is to investigate the effects of lime and waste silica fume additive on a silt and its utilization on railway subgrades stabilization. For this purpose, lime and waste silica fume were added to the silty soil in different contents at the soil optimum moisture; then the California Bearing Ratio (CBR) tests were conducted on the soil samples to estimate the favorable mixture design. At the next step, a selected sample was chosen to be exposed to wetting–drying and freezing–thawing cycles. The results showed that the lime–silica fume additive increases the CBR values of the soil significantly. Furthermore, the first wetting–drying cycle enhances the samples' CBR value, but subsequent wetting–drying cycles decrease the sample's CBR value. Moreover, freezing–thawing cycles reduce the samples' CBR values.

Key words: freezing–thawing cycles, Lime, silica fume, stabilization, wetting–drying cycles

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