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Effect of Lime and Leaf Ash on Engineering Properties of Red Mud

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Abstract : Red mud is a byproduct of aluminum extraction from Bauxite industry. It is dumped in a pond which not only uses thousands of acres of land but having very high pH, it pollutes the ground water and the soil also. Leaves are yet another big waste especially during autumn when they contribute immensely to the blockage of drains and can easily catch fire, among other risks hence also needs to be utilized effectively. The use of leaf ash and red mud in highway construction as a filling material may be an efficient way to dispose of leaf ash and red mud. In this study, leaf ash and lime were used as admixtures to improve the geotechnical engineering properties of red mud. The red mud was taken from National Aluminum Company Limited, Odisha, and leaf ash was locally collected. The aim of present study is to investigate the effect of lime and leaf ash on compaction characteristics and strength characteristics of red mud. California Bearing Ratio and Unconfined Compression Strength tests were performed on red mud by varying different percentages of lime and leaf ash. Leaf ash was added in proportion 2%,4%,6%,8% and 10% whereas lime was added in proportions of 5% to 15%. Optimized value of lime was decided with respect to maximum CBR (California Bearing Ratio) of red mud mixed with different proportions of lime. An increase of 300% in California Bearing ratio of red mud and an increase of 125% in Unconfined Compression Strength values were observed. It may, therefore, be concluded that red mud may be effectively utilized in the highway industry as a filler material.

Keywords : stabilization, lime, red mud, leaf ash
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