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Effect of Lime and Gypsum on Engineering Properties of Badarpur Fly Ash

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Abstract

The present study was conducted to investigate the performance of Badarpur fly ash stabilized with lime and gypsum. The work investigates the effect of lime (4%, 8%, 12% and 16% by mass of dry fly ash) and gypsum (1%) on compaction (in terms of density/moisture relationship), unconfined compressive strength (UCS), California bearing ratio (CBR), split tensile strength, and resilient modulus of fly ash. Based on strength, fly ash stabilized using 12% lime and 1% gypsum was observed as the highest strength mix. The microstructural development of the stabilized mix was studied through SEM and XRD. The results showed that Badarpur fly ash acquired UCS of 4697 kPa, CBR of 73% after 28 days of curing, split tensile strength of 630 kPa, and resilient modulus of 651 kPa. The strength increases with curing period and the composite achieved strength of 6150 kPa after 90 days of curing. This stabilized Badarpur fly ash can be utilized as road construction material.

Keywords: fly ash, gypsum, lime, strength, microstructural development

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