



Chemical and Geotechnical Properties of Expansive Soil Stabilized with Fly Ash and Geotextiles

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Abstract:Expansive Sub-grade soil improvement is one of the primary and major processes in the construction of any highway.Roads on black cotton soil often fail due to swelling and shrinking of such soil which makes stabilization mandatory. As flyash is available at very lower cost it can be used for stabilization of expansive soils for various uses. This present research aims to utilize the fly ash in road application. In this research index, engineering, chemical properties of virgin soil has been studied. In addition, chemical analysis is done for soil and fly ash mixture. Flyash is added to the soil with 10%, 20%, 30%, 40%, and 50% by weight of soil. The soil falls under CI category. It has 50% free swell index. The CBR of soil is 13.6% and it reduces to 2.66% when soaked. Shear strength of soil is 42.06 kpa at its optimum moisture content of 15% with maximum dry density of 1.658 g/cc. This study indicates that plasticity index, free swell index, pH, and cation exchange capacity, are decreasing with the addition of fly ash and total soluble solids, calcium carbonate content are increasing with the addition of fly ash. To ascertain the soil composition, XRD analysis has been done.

Keywords : Subgrade,Flyash,Plasticity index, Free swell index, pH, Cation exchange capacity, XRD analysis, Total soluble solids, Calcium carbonate content,Geotextile,CBR,MRA.

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