STRENGTH AND DURABILITY OF GYPSEOUS SOIL TREATED WITH WASTE LIME AND CEMENT

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Abstract
Recently huge amount of various by-product materials have been produced from industrials. These materials have detrimental effects on the environment. Hence, the re-use of such materials for different purposes as for construction work or other activities is essential goal of this study. Because some of geotechnical problems are associated with the gypseous soils as a foundation, hence the waste lime as one of the by-product material has been added to improve their properties. In addition, the combined additives of waste lime plus cement have been examined and compared with those treated either with waste lime or cement. Soil with 23% gypsum content has been treated with waste lime up to 8% and combined additives of waste lime plus cement by percentages of (4%+8%, 6%+8% and 8%+8%). These mixtures have been compared with the soil stabilized with cement up to 16%. The results indicated the efficiency of the combined additives of waste lime and cement in the improvement of compressive and tensile strengths of gypseous soil. The treated soil becomes more durable against the cycles of wetting and drying. Samples treated with cement or combined additives gain more durable ability, while those treated with waste lime alone fail under durability circumstances (wetting and drying cycles). The combined additive of waste lime plus cement (4%+8% and 6%+8%) is approximately equivalent to the 16% cement from strengths view point. Accordingly, this would reduce the amount of cement required for stabilization about 50% by using waste lime.

Keywords: Gypseous soil, Industrial waste lime, Durability, Soil Stabilization.