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Study on the use of waste polythene in reducing the brittleness of soft soils improved with cement

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Problematic soils with difficult ground conditions required specific geotechnical engineering solutions. Soft clays cannot directly be utilized in civil engineering projects due to the inherent properties such as very high water content, high compressibility and very low shear strength. This paper describes a study on the effect of polythene and cement on engineering properties (compaction and California bearing ratio) of clayey soil improved with cement and polythene. The amount of cement and polythene added to the clayey soil sample, as a percentage of dry soil mass were in the range of 1%-3% and 0.25-1.5% respectively. The results of the study showed that cement and polythene could change the engineering properties of clayey soil. The maximum dry density was found to increase while the optimum water content was found to decrease with increased cement content. Brittleness of soil is increased when cement is added into the soil however, it can be suggested that due to the properties of polythene, as observed, brittleness is decreased. It was also found that percentage of cement in changing the mechanical properties of soil depends on the type of soil. CBR test results of improved soil indicate possible applications in road sub bases and as a sub grade material. This study on the use of waste polythene in improving problematic soil with cement was able to prove that this application is economical in improving soft soils and safe in disposing waste polythene. Recommendations are also made for further research with different cement contents and different waste materials to be used as clay liners.

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