

Plastic as a Soil Stabilizer

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Abstract: Soil stabilization is any process which improves the physical properties of soil, such as increasing shear strength, bearing capacity etc. which can be done by use of controlled compaction or addition of suitable admixtures like cement, lime and waste materials like fly ash, phosphogypsum etc. The cost of introducing these additives has also increased in recent years which opened the door widely for the development of other kinds of soil additives such as plastics, bamboo etc. This new technique of soil stabilization can be effectively used to meet the challenges of society, to reduce the quantities of waste, producing useful material from non-useful waste materials. Use of plastic products such as polythene bags, bottles etc. is increasing day by day leading to various environmental concerns. Therefore the disposal of the plastic wastes without causing any ecological hazards has become a real challenge. Thus using plastic bottles as a soil stabilizer is an economical utilization since there is scarcity of good quality soil for embankments. This project involves the detailed study on the possible use of waste plastic bottles for soil stabilization. The analysis was done by conducting plate load tests on soil reinforced with layers of plastic bottles filled with sand and bottles cut to halves placed at middle and one-third positions of tank. The comparison of test results showed that cut bottles placed at middle position were the most efficient in increasing strength of soil. The optimum percentage of plastic strips in soil was found out by California Bearing Ratio Test and using this percentage of plastic, plate load test was also performed. The size and content of strips of waste plastic bottles have significant effect on the enhancement of strength of the soil].

Keywords: Soil stabilization

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