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DURABILITY IMPROVED GEOMAT REINFORCED VERTICAL EMBANKMENT BEHAVIOUR

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For the design of internally stabilized reinforced earth walls, the lateral deformation is not considered as a design criterion, and therefore, the designer would not know the performance of the wall with regard to its aesthetic appearance during its service life. Therefore, it is imperative that the designer limits the lateral deformation of reinforced earth walls under service loads. In addition to the durability considerations, suitability of application of coated coir geomats as the reinforcing material in a vertical embankment requires an investigation of its lateral deformation characteristics as well.

In this study, the lateral deformation characteristics of a model vertical embankment reinforced with coated coir geomats are compared with the lateral deformation characteristics of the same model embankment reinforced with uncoated coir geomat. For this purpose, a vertical embankment of height 500 mm and length 700 mm was formed by using coated coir geomats of length 605 mm at a vertical spacing of 100 mm as reinforcement in a soil having shear strength parameters of $c' = 5$ kPa and $\phi' = 31^\circ$ compacted to 95% of standard Proctor density. The embankment was initially loaded at its natural moisture content up to a maximum surcharge pressure of 100 kPa through a rigid steel plate and was unloaded. It was then reloaded up to a maximum surcharge pressure of 250 kPa and was unloaded. The embankment was then soaked over a period of 48 hrs ensuring that no erosion of the soil takes place during the process and again the embankment was loaded up to a maximum surcharge pressure of 250 kPa. During the above loading and unloading processes the lateral deformation along the central vertical axis was measured at the mid-height of each soil layer.

Based on the laboratory experimental model study, it can be concluded that irrespective of whether the loading is applied under natural moisture content of the fill or soaked condition, the polymer coated coir geomat reinforced vertical wall showed similar lateral deformation to that of uncoated coir geomat reinforced wall, at the same fraction of the allowable surcharge pressure corresponding to each material. This implies that improvement of the durability of coir geomats by coating with a polymer material will not affect the lateral deformation characteristics of the coir mat reinforced wall.

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