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Assessment of the Interface Strength between High-Density Polyethylene Geomembrane and Expanded Polystyrene by the Direct Shear Test

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Abstract : The use of light landfills is an effective solution for road works in soft ground sites, such as Rio de Janeiro (RJ) and Santos (SP) - the Southeastern Brazilian coast. The technique consists in replacing the topsoil by expandable polystyrene (EPS) geofoam, lined with geomembrane to prevent the attack of chemical products.Thus, knowing the interface shear strength of those materials is important in projects to avoid rupturing the system. The purpose of this paper is to compare the shear strength in the geomembrane-EPS interfaces by the direct shear test. The tests were performed under the dry and saturated condition, and four kind of high-density polyethylene (HDPE) 2,00mm geomembranes were used, smooth and texturized - manufactured in the flat die and blown film process. It was found that the shear strength is directly influenced by the roughness of the geomembrane, showed higher friction angle in the textured geomembrane. The direct shear test, in the saturated condition, also showed smaller friction angle than the now-wetted test.

Keywords : geofoam, geomembrane, soft ground, strength shear
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