

UNIVERSITI TEKNOLOGI MARA

**INTERFACE SHEAR STRENGTH
BETWEEN GEOTEXTILE AND
SOIL-SODIUM BENTONITE LINER**

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ABSTRACT

Landfill liner system is designed to provide maximum protection to the environment. Installation of the liner system is supervised and inspected to ensure that it meets or exceeds environmental standards. The installation of geotextile on landfill is spread by layers and will be overlapping between each layer about 0.5 m to 1.0 m. However, the occurrence of the soil movements is always expected to occur. Due to the soil movement, the geotextile actuates and hence the activity will increase the leakage probability of the leachate into the environment. Therefore, an additional material to improve the stability of the soil liner is required. In this study, the movement of geotextile on the soil liner design can be reduced by mixing the soil liner with sodium bentonite. Three (3) soil samples from the reserved site for future landfill in Jengka Ten (10) Maran, Pahang were taken for this study. The laboratory tests conducted on the samples were to determine their physical properties, the compaction and direct shear tests. In order to estimate the interface shear strength, rigid block glued with geotextile and containing compacted soil samples at maximum dry density and optimum moisture content were prepared for direct shear test. From the direct shear test, the best value of friction angle (δ) with appropriate percentage of sodium bentonite can be determined. In this study, the best percentage of sodium bentonite added to the soil sample was found to be 15% of sodium bentonite. This is because interface shear strength becomes optimum at 15% of sodium bentonite being added. That was based on some of other properties of the soil sample added with sodium bentonite which has shown that sodium bentonite can improve the soil sample properties and meets the requirement of soil liner design at 15% of sodium bentonite. Hence, the results from this study can serve as a guideline in designing the soil liner for future landfill that is going to be built soon in reserve lot for new landfill in Jengka 10, Maran and for other landfills that have the same type of soil as the landfill area chosen in this study.

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