



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Thesis Title: **The hydro mechanical behavior of compacted sand –bentonite-fiber composite for landfill application**

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Generally, a compacted sand-bentonite mixture is used as a landfill liner material. However, at low stress, desiccation induced moisture variations can affect the reduction in plastic deformability and forms shrinkage cracks, which can increase the uncontrolled migration of leachates, particularly around the tensile failure. Also, if the strength of the base material is not enough, e.g. on steep slopes in bottom liners, capping systems and landfill stability, then the effective operation of the total liner system may be threatened. Therefore, the objective of this study was to examine the possibility of adding fiber as a reinforcement material to sand-bentonite mixtures to improve the stability of the liner without significantly increasing its hydraulic conductivity. Consolidated undrained triaxial (CU) and oedometer and shrinkage tests have been performed on sand-bentonite mixtures (90:10; 80:20 and 70:30) reinforced with a different type of the waste fiber (i.e. tire fiber and glass fiber). The test result suggested that hydro-mechanical behavior of the composite was significantly altered by the inclusion of the different type of fiber.