Slope Stability for Submarine Clays: Triaxial and Consolidation Testing

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Abstract

Evaluation of submarine slope stability requires characterization of the soil’s properties and stress-strain behavior. Standard geotechnical testing such as grain size analysis, plasticity indexing, triaxial and consolidation testing provide basic information required for modeling and analysis of submarine slopes.

A comprehensive geotechnical laboratory investigation was conducted on submarine samples collected from the Gulf of Mexico. Continuous profiles of bulk density, p-wave velocity and porosity were logged for each core using a Geotek Multi-sensor core logger (MSCL). Using these profiles, undisturbed samples were selected triaxial and consolidation testing. Shear strength and remolded shear strength testing was conducted at the using a miniature vane. The stress-strain behavior of the Gulf of Mexico samples was investigated using isotropically consolidated undrained (CIU) triaxial testing. Compression and consolidation properties were determined using constant rate of strain (CRS) consolidation and standard incremental load consolidation tests. Moisture content, specific gravity, index testing and grain size analysis was also conducted.