09.06: The Effect of Silt Fraction on Mudrock Strength

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ABSTRACT

Variations in clay and silt content have been found in mudrock basin fills. Several studies have characterized the compression behavior of various silt-clay mudrock mixtures but little is known on the variation in strength parameters. This study makes use of K_0-consolidated undrained triaxial compression tests to study the behavior of mixtures of Resedimented Gulf of Mexico Eugene Island (RGoM-EI) and Min-U-Sil. Specimens were prepared using standard resedimentation techniques and compressed to 1 MPa prior to shear.

The results are divided into a clay support domain and a silt support domain separated by a critical clay content of 80 %. The clay domain achieves a consistently decreasing porosity at 1 MPa as the clay fraction decreases. It has a decreasing lateral stress ratio, increasing shear strength and increasing friction angle with decreasing clay fraction. The fabrication method (initial porosity) has a large impact on the grain domain causing a large variation in properties at 1 MPa.

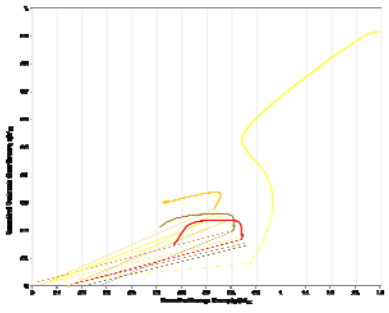

Fig 1: Effective stress paths for Silt-Clay specimens compressed to 1 MPa.

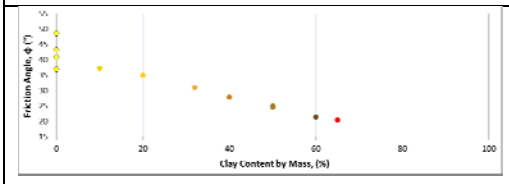

Fig 2: Friction Angle systematically reduces as the clay content increases

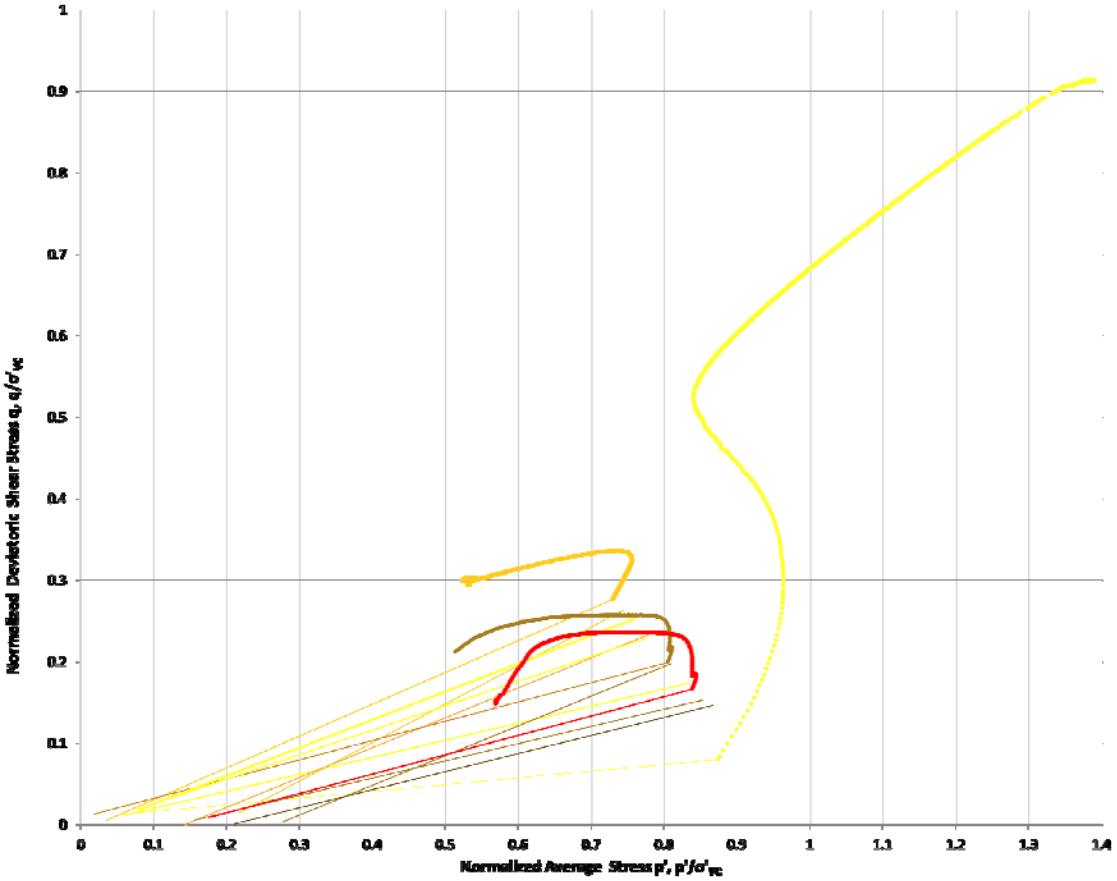

Fig. 1: **Total stress path of Silt-Clay specimens by silt content.**

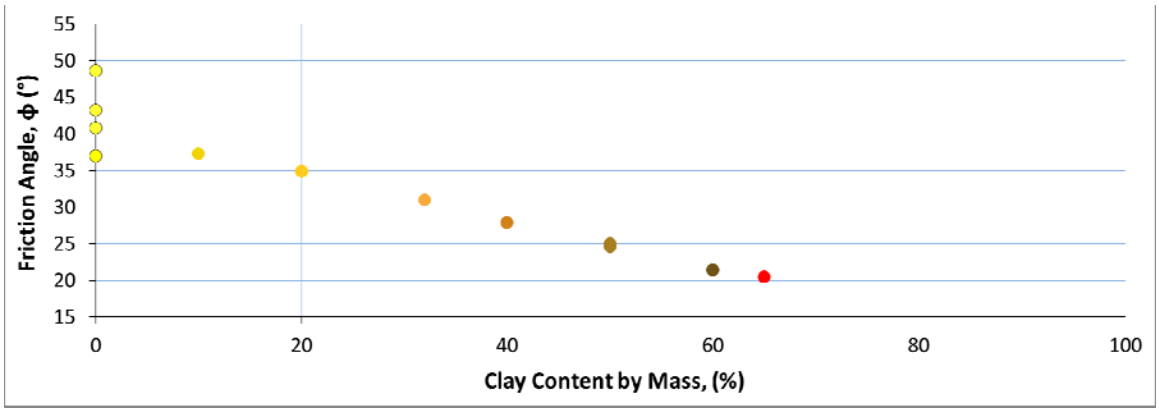

Fig. 2: **Failure Angle by specimen silt content by mass.**