The objective of this thesis is to determine the relative shear strengths of halloysite, kaolinite, synthetic mixtures, and local soils, to investigate the influence of halloysite content on the shear strength of kaolinite, and to explore the possibility that the strength properties of soil clays might be controlled by the relative content of their component minerals.

Sets of samples of pure kaolinite and halloysite minerals and their mixtures in proportions of 1:1, 3:1, and
1:3 were prepared in the Harvard Miniature Compaction device, each compacted in four separate layers with 35 tampings from the 30 pound spring compactor on each layer. The specimens were cured at 15 degrees Celsius for 48 days and then tested in a MST Computer Controlled Servohydraulic Closed Loop unconfined compression unit. Two local soils known to contain halloysite or mixtures of halloysite and kaolinite were also investigated in a similar manner and correlated with the pure minerals. Samples used for correlations were compacted at optimum moisture content and yielded optimum densities in the 83% to 98% saturation range. Within the testing range, the relative shear strength of halloysite #13 from Eureka, Utah was higher at 1.88±0.17 kg/cm$^2$ than the 1.51±0.2 kg/cm$^2$ value of kaolinite from Twiggs Co., Macon, Georgia. The relative shear strengths of the synthetic mixtures at 1.58±0.36 kg/cm$^2$, 1.74±0.23 kg/cm$^2$, and 1.81±0.22 kg/cm$^2$, respectively, ranged between the limiting values of the mineralogically pure halloysite and kaolinite and were in direct proportion to the percentage of their component minerals. The shear strength of the soil halloysite at 1.78±0.11 kg/cm$^2$ and that of the soil kaolin mixture at 1.74±0.09 kg/cm$^2$ correlated with the shear strength of the pure halloysite mineral and of the 1:3 (kaolinite:halloysite) synthetic mixture, respectively.