ABSTRACT

The relation between the properties and the water content of an undisturbed loess were investigated to provide insight into the mechanical behavior of the natural soil. Hand-carved samples from a single deposit, at their natural water contents, and at water contents modified in the laboratory to provide a range from 8% to 32%, were subjected to unconsolidated-undrained triaxial compression tests, consolidation tests, and initial negative pore water pressure tests. In addition, the clay-size fraction was separated from the remainder of the loess for a separate series of tests to establish its properties. The natural water content of the deposit in the field was measured at regular intervals for one year to provide an example of the range in properties that would be encountered at this site.

The test results are presented and their interpretation leads to conclusions regarding the volumetric relations that exist as the water content varies. The significance of the water content in relation to the properties of the natural soil is explored and the concept of a critical water content for loess is introduced.