Sohag University Soil mechanics & Foundation (2)

Faculty of Engineering 3rd year civil

Civil Eng. Department Sheet No (2)

Shear strength of soil

1. The following results were obtained at failure in a series of drained triaxial test on fully saturated clay specimens originally **38 mm** diameter by **76 mm** long. Determine the value of the shear strength parameters c' and ϕ'.



1. The following results were recorded during consolidated undrained test triaxial compression tests on soil.



Determine the shear strength parameters with respect to total stress (ccu , ϕcu ) and with respect to effective stress ( c' and ϕ' ) applying mohr's and modified failure envelopes ?

1. A consolidated-undrained triaxial compression test on an over consolidated clay yielded the following results.



Determine the shear strength parameters with respect to total stress (ccu ,ϕcu) and with respect to effective stress ( c' and ϕ' ) applying mohr's and modified failure envelopes ?

1. A series of triaxial tests was carried out on a sand soil, the cell pressure in each being constant at 2 .0kg/cm2. The shear strength parameters were found to be c' = 0.0 and ϕ' = 24o

a) If in the undrained test, the pore pressure at failure was 1.25 kg/cm2. What was the maximum deviator stress?

b) If, in consolidated undrained test, the maximum deviator stress was 1.6 kg/cm2. What was the pore pressure at failure?

1. In an in situ vane test on saturated clay a torque of 3.5 kg.m is required to shear the soil

The vane is 50 mm wide by 100 mm long. What is the undrained strength of the clay?