

Shear



Description

The direct shear test is a method of determining the consolidated drained shear strength of soils. The direct shear test is performed by placing a vertical load on the sample which is in a horizontally split box. After the vertical load has consolidated the sample, the two halves of the box are “pulled” apart relative to each other, which causes a shear load to be measured on a load measuring device. Once the soil has been sheared to its shear strength, there is failure and the load rapidly drops off. This procedure is repeated (usually three times) under different vertical loads. A “failure envelope” can then be drawn on a graph which allows engineers to design slopes, dams, foundations, etc.

The direct shear test is used to assess what soil strength might be in a field situation where complete consolidation has occurred under the existing normal stresses. Failure is reached slowly under drained conditions so that excess pore pressures are dissipated.. Direct shear testing is often used when trying to determine the shear strength of sandy materials.

Direct shear devices can also be used to measure residual shear strength. Residual shear strength testing is very important in earthquake prone areas.