



Effect of grain size on the shear strength of Hungarian Sandstones

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Many factors have effects on shear strength along discontinuities of rock mass. It is quite difficult to estimate the value of shear strength on site, thus laboratory tests are normally performed to assess the shear strength. In the past decades several methods have been developed for estimating the correct value of shear strength. All methods contain the effect of the surface roughness of the rock mass. One of the most common empirical methods was given by Barton and Choubey 1977 in which used the joint roughness coefficient (JRC) for representing surface roughness. In this method shape, form or amplitude of the surface roughness are considered when JRC value is calculated, but similarly to other methods, it does not take into account the effect of grain size of sedimentary rocks. In this study Hungarian sandstone samples with four different grain sizes were investigated in laboratory conditions: fine grained (0.125-0.25 mm), medium-grained (0.25-0.5 mm), coarse-grained (0.5-1 mm) and very coarse-grained (1-2 mm) specimens were tested. Failure criteria of Barton and Choubey 1977 was used for estimating the shear strength along discontinuities. In the applied method the values of friction angle were evaluated based on the experimental shear stress and normal stress data pairs of laboratory tests results. JRC values were assessed by comparing ten standard profiles given by Barton and Choubey and in addition the uniaxial normal strength of the intact rock mass was used as the strength of discontinuity surface. The test results suggests that specimens with smaller values of uniaxial normal strength have higher values of residual friction angle.