



Correlation between aggregate quality and compressive strength of andesite from Hungary

Balázs Czinder and Ákos Török

Budapest University of Technology and Economics, Engineering Geology and Geotechnics Budapest, Hungary
(czinder.b@gmail.com, torokakos@mail.bme.hu)

Andesite is one of the most common lithology that is used as aggregate. Testing of aggregate quality traditionally includes Los Angeles, micro-Deval tests and the quality of the stone is assessed according to these values. In the present paper both aggregate properties and strength properties of andesites are compared in order to find correlation between aggregate strength, durability and compressive and tensile strength as well as frost resistance. Tests were made from andesite types obtained from two operating quarries of Nógrádkövesd and Gyöngyössolymos. Uniaxial compressive strength (UCS) values were compared with aggregate test results obtained from the same block. Air dry, water saturated and freeze-thaw subjected specimens were tested. According to lithological description and fabric analyses samples were grouped into 4 main lithotypes: one from Nógrádkövesd and three from Gyöngyössolymos. Fine porphyric andesite from Gyöngyössolymos provided the best micro-Deval values. In terms of uniaxial compressive strength the same trend was found, fine porphyric andesite from Gyöngyössolymos had the highest UCS under laboratory conditions, while coarser porphyritic andesite from the same quarry had lower strength. Water saturation decreased UCS as it was expected. Tensile strength values show a gradual decrease from air dry to water saturated and finally subjected to freeze-thaw cycles. Mean micro-Deval value of fine porphyric Gyöngyössolymos andesite was about 7, while that of the coarser porphyritic andesite was app. 16. These values are still higher than the mean micro-Deval test result of Nógrádkövesd andesite; which was 20. A good correlation was found in between Los Angeles and micro-Deval values, but there was no indication that micro-Deval values correlate well with UCS.