

The use of geophysical methods in assessment of natural stone prospects

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The scope of the study was to test ground geophysical exploration methods in the assessment of the natural stone prospects in the rapakivi granite area in southeastern Finland (Härmä et al. 2015). The measurements in the field included ground penetrating radar (GPR), electrical resistivity tomography (ERT) and induced polarization (IP) as well as ground magnetic intensity measurements (Luodes et al. 2014). Further, geophysical in situ measurements were done in ten drill holes in the target area. Also, petrophysical measurements were carried out for the drill core samples and mini drill samples at GTK's petrophysical laboratory.

The ERT method with IP revealed valuable data and information about inside the solid rock. The drill hole measurements were also good adds for the studies of natural stone quality. The petrophysical data of the drill core samples showed up a good estimate for the quality of the rock as well as reference data for the drill hole measurements. The samples taken from the surface of outcrops were not only enough for the petrophysical studies due to weathered rock on the surfaces. However, it is also important to know the thickness of the weathered zone and it can be estimated with petrophysical samples taken by mini drill. The ERT and IP measurement should be measured before the moss is taken away from the bedrock surfaces. By that way, all of the ground geophysical profiles can be executed in the same location.

Ground geophysical magnetic measurement gave valuable data from the bedrock in the study area. With high resolution ground magnetic intensity data it is possible to get hints from smaller structures or features in the bedrock.

References:

Härmä, P., Selonen, O. & Luodes, H. 2015. The Wiborg granite batholith - the main production area for granite in Finland. In: G. Lollino et al. (eds.), *Engineering Geology for Society and Territory – Volume 5*, 259-262.

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