

Zenon PILECKI

Mineral and Energy Economy Research Institute Polish Academy of Sciences, Cracow, Poland
Wybickiego 7, 31-261 Cracow
pilecki@meeri.pl

Mechanism of sinkholes in the area of a shallow historic post-mining area in the light of geophysical reconnaissance

Abstract

The shallow historic exploitation of Zn-Pb/Fe ore deposits as well as hard coal causes a lot of problems with development of mining terrain in the Upper Silesian Basin/Poland. The occurrence of discontinuous deformations is very difficult for detection and prediction. Discontinuous deformations can occur mostly as sinkholes, ground thresholds, cracks and subsidence plugs. The set of geological and mining factors decides about the type of the deformation and its dimension. The water infiltration is a frequent cause of the reactivation of void in the rock mass. It is also related with the void, which is partly or fully filled with fine – grained, or clayey material. In plenty of cases, geophysical methods are used for identification of discontinuous deformations. One can assume, the most effective methods are gravimetric, seismic, resistivity and ground penetrating radar (GPR). Geophysical testing, requires distinct changes of physical properties in the rock mass. Geophysical recognition of the void is related also with surrounding fracture zone. Such approach appears helpful for the assessment of the hazard of the terrain surface as well as for the effective construction planning and their protection.