Ground subsidence induced by backfill-mining of a nickel mine and development forecasts

F. S. MA, H. J. ZHAO, Y. M. ZHANG & J. GUO

Key Laboratory of Engineering Geomechanics, Institute of Geology and Geophysics, Chinese Academy of Sciences, P.O. Box 9825, Beijing 100029, China
zhaohaijun0823@126.com

Abstract Based on geological investigations and GPS monitoring data, this paper presents ground movement phenomena and characteristics for Jinchuan Nickel Mine, China. The results show that ground subsidence occurred with increasing mining depth. The greatest accumulated subsidence reached 1287.5 mm between 2001 and 2008, and 37 considerable fissures were found at the ground surface. By establishing a mining-geological model, and by applying a numerical computation method, a short-term forecast of rockmass movement is proposed. The results show that the rate of ground subsidence and deformation will intensify further, and the distribution of subsidence and degree of damage to the mine roadway and shaft induced by ground subsidence and deformation will also extend in the following several years.

Key words ground subsidence; rockmass movement; backfill mining; metal mine; forecast