Evaluation of efficiency roof bolting pattern using numerical modelling in Tabas coal mine

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ABSTRACT

This paper presents evaluation of roof bolting pattern of roadway East 1 Main Gate (E1MG) of Tabas underground coal mine. Tabas mechanized underground coal mine, located in Yazd province of Iran has been mined by Longwall and Room & Pillar methods. The results gathered from field investigations and the geomechanical properties of rocks, were determined in the laboratory indicate that the rock masses of this area are weak. To start driving the first (East 1) panel's main gate and tail gate, a 7+6 pattern of 2.4 m roof bolts was considered to be applied in both gates together with 4 and 3 side bolts at left and right ribs, respectively. So, the excavated roadways in this area need to have suitable support. To arriving to this purpose, this was modeled with FLAC2D software. The output of the modelling, in the form of displacements and strains in 7.2 m extensometers, movements in 5 m long dual telltales and axial loads in roof bolts, will be compared to the results of real monitoring instruments (7.2 m multipoint sonic extensometers, 5 m telltales and strain gauge bolts) installed in the gate. Finally good agreement of real monitoring results and the model reveal proper estimation of rock mass properties for modeling.

Key words: longwall, numerical modeling, FLAC2D, roof bolting pattern