

عنوان مقاله:

Study of Rock Pillar Failure Consisting of Non-Persistent Joint using Experimental Test and Fracture Analysis Code in Two Dimensions

محل انتشار:

مجله معدن و محیط زیست, دوره 12, شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 17

نویسندگان:

V. Sarfarazi - *Department of Mining Engineering, Hamedan University of Technology, Hamedan, Iran*

H. Karimi Javid - *Department of Mining Engineering, Hamedan University of Technology, Hamedan, Iran*

K. Asgari - *Department of Mining Engineering, Shahid Bahonar University of Kerman, Kerman, Iran*

خلاصه مقاله:

The experimental and numerical methods were used to investigate the effects of joint number and joint angle on the failure behaviour of rock pillars under a uniaxial compressive test. The gypsum samples with dimensions of 200 mm × 200 mm × 50 mm were prepared. The compressive strength of the intact sample was 7.2 MPa. The imbedded joint was placed inside the specimen. The joint length was 6 cm in a constant joint length. There were several numbers of cracks including one, two, and three cracks. In the experimental tests, the angles of the diagonal plane with respect to the horizontal axis were 0, 30, 60, and 90 degrees. The axial load was applied to the model with a rate of 0.01 mm/s. In the fracture analysis code, the angles of the diagonal plane with respect to the horizontal axis were 0, 15, 30, 45, 60, 75, and 90 degrees. A constant axial load of 135 MPa was applied to the model. The results obtained showed that the failure process was mostly dependent on the angle and number of the non-persistent joint. The compressive strength of the samples was dependent on the fracture pattern and the failure mechanism of the discontinuities. It was shown that the tensile cracks were developed within the model. The strength of the specimens increased by increasing both the joint angle and joint number. The joint angle of 45° KI had the maximum quantity. The stress intensity factor was decreased by increasing the joint number. The failure pattern and failure strength were analogous in both methods, i.e. the experimental testing and the numerical simulation methods.

کلمات کلیدی:

FRANC2D, Physical test, rock pillar, Joint

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1200436>

