

عنوان مقاله:

Estimation of S20-Brittleness (An Input Parameter in Drilling Rate Index, Dri) Using Other Types of Brittleness

محل انتشار:

دومین کنفرانس منطقه ای و یازدهمین کنفرانس تونل ایران (سال: 1394)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

Zagros Mountains is the most important geo-structural zone of Middle East in which many developing major cities, like Shiraz, Ahwaz, Bandar Abbas and Kermanshah in Iran and Sulaymaniyah and Erbil in Kurdistan Region (North East of Iraq) have been constructed. Many structures will be planned and constructed in the near future over and under the ground, such as different types of tunnels. Obviously, one of challenging types of problem is the basic parameters of geomaterials (rock and soil) to be used in estimation of total time and coast of projects. The brittleness is a rock property, which can be used in many ways to evaluate the characteristics of rock. It is an important parameter in whole types of rock excavation design, especially in different methods for estimation of performance of tunnel boring machines (TBMs). NTNU (Engineering Geology Laboratory of the Norwegian Institute of Technology) has proposed a successful performance prediction model for TBMs in which the drilling rate index (DRI) is the most important input. The DRI is obtained from combination of results of two special tests, S20-brittleness and Sievers'J-miniature drill test (SJ). The estimation of these tests from results of ordinary tests can help to estimate the DRI. In this paper, authors tried to estimate the S20-brittleness using proposed strength based types of brittleness for Limestones of Zagros Zone (Iran and North East of Iraq). The uniaxial compression strength, Brazilian, point load and S20-brittleness tests were performed on more than 60 Limestone samples. Then the calculated brittleness values were compared and fitted to S20 values. Results show partly good relation between S20 and the brittleness of B9, B10, B12 and UCS as the $R^2 \approx 0.8$ and greater were found for fits. Finally, the S20-brittleness was estimated using the deduced relationships.

کلمات کلیدی:

S20- brittleness; DRI; Zagros; Limestone; TBM

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