

عنوان مقاله:

۳D Characterization of Uniaxial Compressive Strength of Transversely-Isotropic Intact Rocks

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خلاصه مقاله:

The uniaxial compressive strength (UCS) of intact rocks is one of the key parameters in the course of site characterizations. The isotropy/anisotropy condition of the UCS of intact rocks is dependent on the internal structure of the rocks. The rocks with a random grain structure exhibit an isotropic behavior. However, the rocks with a linear/planar grain structure generally behave transversely-isotropic. In the latter case, the UCS of intact rocks must be determined by a set of laboratory tests on the oriented rock samples. There are some empirical relations available to describe the strength of these rocks. Though characterization of transversely-isotropic rocks is practically a ۳D problem, but these relations provide only a ۲D description. In this paper, a method is proposed to provide a ۳D description of UCS of transversely-isotropic rocks. By means of this formulation, one can determine UCS along with any arbitrary spatial direction. Also, a representative illustration of UCS is proposed in the form of contour-plots on a lower hemisphere Stereonet. The method is applied to an actual case study from the Kanigoizhan dam site located in the Kurdistan Province (Iran). Application of the proposed method to the phyllite rocks of this site show that the direction perpendicular to the dam axis exhibits the most anisotropic behavior. Hence, it is essential to take the strength anisotropy into account during the relevant analysis. The results obtained, together with the statistical variation of UCS, provide a practical approach to select the proper values of UCS according to the scope of the analysis.

کلمات کلیدی:

۳- Dimensional characterization, UCS, Transversely-isotropic, Intact rock, Stereonet

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