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Title:

Rock mass classification in anisotropic rockmasses. The new rockmass classification system, A-RMR.

Abstract

The lecture will present an overview on the behavior of anisotropic and heterogeneous rocks and rockmasses. Anisotropic rocks possess inherent anisotropy, which has a significant effect on their strength and deformation properties.

The engineering framework of anisotropic rockmasses is based on identifying the anisotropy degree of rock, using the following indices: a) Uniaxial compressive strength index, b) Wave velocity index and c) Point load index.

The modified Hoek – Brown failure criterion for anisotropic rocks (Saroglou, 2007) and an update and applicability on its use in the last decade will be presented.

In the second part of the lecture, a new Rock Mass Classification system, called Anisotropic Rock Mass Rating (A-RMR), developed specifically for anisotropic rock masses will be presented.

A-RMR considers the following parameters: a) anisotropy strength index, R_c , b) uniaxial compressive strength of intact rock, c) degree of structure anisotropy, d) corrected Rock quality designation (RQD), e) condition of anisotropy surfaces and f) groundwater conditions. A correction of the total rating is also proposed based on the confining stress range of the project.

Its use will be demonstrated and explained through application in specific case studies from the design of tunnels and slopes in anisotropic rockmasses.

Finally, the application the rating system in the modified Hoek & Brown failure criterion will be presented and the limitations, advantages will be discussed.

About the speaker



Dr. Harry Saroglou is a Senior Teaching & Research Fellow in the School of Civil Engineering, National Technical University of Athens. He is a former Lecturer/ Visiting Lecturer at the Department of Civil & Environmental Engineering in Imperial College, where he lectured “Engineering Geology” and “Rock Engineering” in the M.Sc. of “Engineering Geology” and M.Sc. of “Soil Mechanics” (2013- 2016). In 2016 he was a visiting Professor in the Chinese Academy of Sciences, in the Institute of Geology and Geophysics.

He holds a B.Sc. in Geology, a D.I.C., M.Sc. in Engineering Geology from Imperial College, an M.Sc. in “Design and Construction of Underground Works” and a PhD from NTUA. He has received an Honor from the Academy of Athens (2009) for his research and the Richard Wolters Prize by the International Association of Engineering Geology and the Environment (IAEG) in 2012.

He has authored 70 publications in scientific peer-reviewed journals and international Conferences and his research has a strong scientific impact. He is an Editorial Board Member in the Bulletin of Engineering Geology of IAEG. He participates as an active member in Scientific Commissions of IAEG, ISRM and ISSMGE.

He has gained practical experience in consulting in Civil Engineering projects (highways, tunnels, slope stability, dams) for the public and private sector in Greece, UK and abroad.

His research interests are the engineering behavior of rocks and rockmasses, weak rocks and complex formations, the engineering geology of major infrastructure works, tunnelling and geohazard risk assessment (landslides and rockfalls).

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