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- Many thanks, Wilham G. Louhenapessy Thursday 29 June 2000

Tunnel Support Design with Finite Element Analysis

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Abstract

One of the major shortcomings of the Q classification system is that it does not take into account the orientation of rock joints with respect to the exposed surface of the tunnel excavation. This paper proposes a rational methodology by taking into consideration the influence of the orientation of joint sets. Using the finite element method and the multilaminate model for jointed rock masses (Zienkiewicz & Pande, 1977), a set of design charts (rose diagrams) useful to the practising engineers for circular tunnels are presented.

Introduction

Rock mass classification systems, such as the Q classification system (Barton *et al.*, 1974) and RMR system (Bieniawski, 1990), as well as others are efforts to classify rock mass properties and the rock condition as a single number. Advanced numerical methods have been frequently adopted but are not suitable for routine analysis especially when unforeseen conditions are encountered on-site during construction.

Stability in rock tunnels

Collapse of the tunnel roof, sides or face takes place when the stresses which are imposed on the rock mass due to excavation exceed its strength. Thus, the factors which influence the collapse of a tunnel are, strength of the

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