عنوان مقاله:

Appropriate Loading Techniques in Finite Element Analysis of Underground Structures

محل انتشار:

ماهنامه بین المللی مهندسی, دوره 11, شماره 1 (سال: 1377)

تعداد صفحات اصل مقاله: 9

نویسنده:

J. Hematian - *Mining Engineering, Shahrood University of Technology*

خلاصه مقاله:

Stability of underground structures is assessed by comparing rock strength with induced stresses resulted from ground stresses. Rock mass surrounding the opening may fail either by fracture or excessive deformation caused. Accurate calculation of induced stresses is therefore fundamental in the stability analysis of an opening. Although numerical methods, particularly finite element method, are very promising methods in finding out induced stresses, special care must be taken at various stages of constructing and analysing such models. This paper describes the significance of loading technique; the way that ground stresses are applied to the finite element model in finite element analysis (FEA) of underground structures. The purpose of this research is to illustrate the results obtained from similar models which were constructed in different ways regarding the loading technique. Key factors for choosing an appropriate loading method whilst considering the in-situ condition of the structure are addressed. To carry out this investigation, the three-dimensional finite element program, NASTRAN, was used. The results of FE models were compared with those obtained from closed solution methods as well as field investigations conducted both during this research and reported by others. Based on the results of this study, appropriate loading techniques are developed and suggested for various conditions. The application of these techniques to the stability analysis of .underground structures resulted in encouraging findings

کلمات کلیدی:

Loading (Technique), Stability, Underground Structures, finite element analysis