High solar container rock mass excavation

Are high-stress brittle rock masses damaged during excavation at Shuangjiangkou underground caverns?
This study reports detailed findings from an exhaustive investigation on the damage characteristics and underlying mechanisms in the high-stress brittle surrounding rock masses during excavation at the Shuangjiangkou (SJK) underground caverns.

Can brittle rock masses be identified by high-stress excavation?
These research findings are poised to provide valuable insights into the damage identification of brittle surrounding rock masses subjected to high-stress excavation, contributing to optimize excavation design and enhance the safety and sustainability of underground engineering projects. 1. Introduction

What is the energy evolution of rock mass during deep tunnel excavation?
The general process of spatio-temporalenergy evolution of rock mass during deep tunnel excavation was revealed. Continuous excavation in deep tunnels generally involves an energy accumulation process (a SED peak) and two energy release processes (two EDR peaks).

How does pilot tunnel excavation affect the energy evolution of rock mass?
Figure 22 provides a more intuitive picture of the effects of pilot tunnel excavation on the energy evolution of rock mass. Obviously,after the secondary excavation of the main tunnel,the energy level of surrounding rock within the length range of pilot tunnel is significantly reduced,and the stability is significantly improved.

Can excavation-induced damage be measured in high-stress brittle rock masses?
This consistency validates that the newly proposed damage index has good applicability and reliabilityfor quantifying excavation-induced damage in high-stress brittle surrounding rock masses.

How does excavation affect underground caverns?
Excavation-induced damage in the surrounding rock mass of underground caverns is primarily manifested through the formation of new stress-induced fractures.

Therefore, in deep rock excavation engineering, the description of dynamic disaster response induced by excavation, the exploration of hidden disaster sources, and disaster forecasting ...

A weak interlayer zone (WIZ) is a poor rock mass system with loose structure, weak mechanical properties, variable thickness, random distribution, strong extension, and high risk due to the shear ...

In this work, special attention is paid to the problem of the formation and effective use of a new resource-saving and environmentally friendly container technology for moving rock mass ...

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To deeply analyze the failure evolution of surrounding rock during excavation-induced unloading of the high-stress rock mass, a multistage failure model was established based on ...

From these comprehensive observation results, the mechanism of rock mass mechanical behaviour is clarified; that is, the macroscopic deformation or failure characteristics of the ...

Abstract Deep underground excavations within hard rocks can result in damage to the surrounding rock mass mostly due to redistribution of stresses. Especially within rock masses with non-persistent ...

2490 m and 2550 m in highly stressed grounds, along with engineering solutions that effectively reduce exposure and risk associated with the excavations. Proactive measures were completed ahead of ...

One is to evaluate the rock mass specifically for the parameters included in the classification methods; the other is to accurately characterise the rock mass and then attribute parameter ratings at a later time.

There exist many high-steep rock slopes in Southwest China due to the construction of large-scale hydropower projects. The study on excavation-induced damage of high rock slopes is vital for ...

This study aimed to investigate the influence of the high temperature of excavation unloading on the physical and mechanical properties of unlined tunnel surrounding rock that has ...

In designing support for hard rock excavations it is prudent to assume that the stability of the rock mass surrounding the excavation is not time-dependent. Hence, if a structurally defined wedge is exposed ...

Large underground caverns are characterized by high geostress, high sidewalls and complex geological conditions, which make the rock masses suffer a series of failures in the process of excavation. The ...

This study focuses on the mechanical characteristics of the surrounding rock and the energy evolution mechanism during the unloading process of high-stress rock mass excavation.

This study investigates the blast-induced damage distribution in inclined shafts and surrounding rock masses at the Tianchi Pumped Storage Power Station, focusing on high geostress ...

These research findings are poised to provide valuable insights into the damage identification of brittle surrounding rock masses subjected to high-stress excavation, contributing to ...

Evolution mechanisms of stress-induced disasters in deep hard rock excavations, such as spalling, deep cracking, massive roof collapse, large deformation and rockbursts, have been ...

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The damage induced by the blasting load and the transient unloading of the excavation load in surrounding rocks should not be ignored during the excavation process of deep-buried tunnels ...

The high-stress and high-temperature issues of deep engineering pose significant challenges to deep resource exploitation and underground space utilization. By establishing a ...

<p>The weakening of rock mass properties caused by blasting excavation has an adverse effect on slope stability. The Hoek-Brown (H-B) criterion is one of the effective approaches to quickly estimate ...

The excessive destruction of surrounding rock in deep tunnel will change the original environmental state and destroy the natural ecological balance. Research on the dynamic response characteristics ...

To analyze and predict the mechanical behaviors of deep hard rocks, some key issues concerning rock fracturing mechanics for deep hard rock excavations are discussed. First, a series of ...

This study focuses on the mechanical characteristics of the surrounding rock and the energy evolution mechanism during the unloading process of high-stress rock mass excavation. ...

Assessing fracturing mechanisms and evolution of excavation damaged zone of tunnels in interlocked rock masses at high stresses using a finitediscrete element approach : 13

These have posed a serious threat to the stability of caverns surrounding " rock and the safety of personnel and equipment. Even during the excavation of shallow dam foundation, layered exfolia-tion ...

On the contrary, the test equipment is easy to carry and operate on, suitable for rock mass surface stress measurement under extremely high stress conditions, and able to provide in situ stress ...