

Qualitative evolving rockfall hazard assessment for dolomite's highwalls in Golbini 7 Mine, Jajarm Bauxite mines complex

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English Extended Abstract

Summary

Shape of Rock failure depend on strength condition and dip of bedding planes, discontinuities direction, condition of discontinuities (filling, roughness, spacing and weathering), face geometry and area condition. Slopes can be divided into homogeneous and non-homogeneous based on rock structure. In the homogeneous slopes, failure is circular shape and in non-homogeneous slopes, failure is plane, wedge and toppling failure or combined failure. The aim of this study is slope stability analysis of the dolomite wall of Golbini 7 Mine. In these slopes, instability is of rockfall type that analyzed by qualitative rockfall hazard assessment method and RocFall software and the results were compared.

Introduction

Over the last three decades, several methods have been proposed to assess the rockfall hazard in the highways and mines. In open-pit mines, rockfalls threaten not only human lives, but also machinery and portal structures located at the toe of highwalls. Therefore, rockfalls are one of the major hazards in open-pit mines. Qualitative or quantitative procedures can be used to distinguish between hazard classes.

Methodology and Approaches

One of the basic methods for stability analysis of the dolomite wall, especially on rock slopes, is to assess the rockfall hazard. In this paper, a qualitative rockfall hazard assessment method, named qualitative Evolving Rockfall Hazard Assessment (ERHA) and RocFall software which is specifically developed for the assessment of rockfall hazards, is used. In this method, based on the visual monitoring system, unstable blocks are recognized and Rockfall hazard is evaluated. In the study, the dolomite wall Golbini 7 Mine was divided into 13 different zones and in each zone, blocks prone to instability were identified. The total number of the evaluated blocks is 46 cases. All blocks analyzed by qualitative rockfall hazard assessment method and RocFall software.

Results and Conclusions

The blocks related to zone 8 have a medium to high risk level and all blocks related to zone 13 have a high hazard level. No block is at the low hazard level. Only 2% of the assessed block are in the low to medium hazard level. 9% are in the medium hazard level, 50% are in the medium to high hazard level and 39% are in the high hazard level. The rockfall distance from the toe of the face determined by the evolving rockfall hazard assessment method and the results are compared with the modeling results by RocFall software. The maximum difference between the results is 25%.
