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FINAL YEAR PROJECT REPORT

DESIGN OF A RIGID TIMBER MINE EXCAVATION SUPPORT SYSTEM TO ENHANCE SAFETY OF SMALL SCALE MINERS AT KITUMBI-KAYONZA GOLD MINE IN LUBAALI.

BY

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ABSTRACT.

This support system is not called upon to carry very heavy loads due to large wedge failures or to massive stress induced instability, but its function is to provide an acceptable level of safety for personnel and equipment in the mine.

From the experiments and site investigation carried out which involved a site specific risk assessment (SSRA) to assess the suitability of the selected support system, stability of the excavation and the adjacent ground conditions and structures; the necessary parameters for the design of a rigid timber/wood mine excavation support system were established.

These parameters included the Uniaxial Compressive Strength, Rock density, Size measurements and shape of the mine excavation.

Basing on the above findings, the mine excavation timber support system design key aspects were determined, i.e. rock load, load bearing capacity of the support system, applied support load and support estimations requirements. The support safety factor was determined based on the load bearing capacity of the support system, the rock load and the applied support load. The support safety factor greater than one is the basis to justify that the Area of influence is well supported and this ensures that there is no fear of roof fall, therefore it can be concluded that the rigid timber/wood mine excavation support system designed is adequate.

ANALYSIS: the analysis of the data obtained was done by plotting the graphs and chats to observe the behavior of the project results and AutoCAD was used to draw the support designs.

DISCUSSION: the results obtained from analysis were then used to suggest the mine excavation timber support system design key specifications that will benefit the mine workers in pursuing safety during the mining operations.

Therefore, if the aforementioned findings are properly implemented, it will enhance the safety of small scale miners for Kitumbi–Kayonza Gold Mine Adit, Lubaali; **Location: 36N 0358838, UTM 0083939: Elevation: 1237m.**

As a recommendation, this Support system can be included in the numerical model for better understanding of the stability of the workings.

DECLARATION

This project report is my own original documentation and has never before been, partially or fully submitted to any University or institution of higher learning for the award of a Bachelor of Science in Mining Engineering or any other related award.

Signature .....

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Date.....20/05/2016.....

APPROVAL

This project which has been prepared under my supervision has my endorsement for submission

Main Supervisor

Signature .....

Eng. Nasasira Hilary

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I am indeed thankful to God the Almighty who has seen me through this amazing project and who by His grace I have been successful.

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DEDICATION

To my family: thanks for the discipline of your collective love; to my friends and mining classmates, the class of 2012: thanks for the valuable discussions throughout the struggle years.

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CHAPTER ONE: BACKGROUND.

1.0 Introduction.

"Disturbance to natural ground settings to a minimum could be considered as directly proportional to cost reduction and minimizing problems encountered during ground excavation and mining."

The safe and economical construction of tunnels, mines and other subterranean works depends on the correct choice of support systems to ensure that the excavations are stable and safe for activities, (Evert, Kaiser, & Bawden, 1995).

The simplest form of underground excavation support is that which is installed solely for 'safety' reasons. This support is not called upon to carry very heavy loads due to large wedge failures or to massive stress induced instability, but its function is to provide an acceptable level of safety for personnel and equipment in the mine.

Note that there are hundreds of kilometers of mining and civil engineering tunnels around the world which have been successfully mined and operated without support. These tunnels are either in very good quality rock or they are used infrequently enough that safety is not a major issue.

The decision on when support is required in such tunnels is a very subjective one, since there are very few guidelines and those which do exist vary widely from country to country. Possibly the only consistent guideline is that heavily trafficked openings, such as shafts, ramps and haulages, should have rock bolts and mesh installed to protect personnel and equipment from rock falls.

However, for small scale mining, perhaps due to limited economic capacity, wood/timber support system is also recommended since it can also subsequently bear large loads for a longer period without failure, while ensuring adequate monitoring and control.

Timber supports are fairly common in underground small scale mines, (Walle, 2006).

Timber supports are very common and relatively easy to install and maintain.

1.1 Geology of the area

Kitumbi- Kayonza gold mine, Lubaali lies on the Rwenzori fold belt mainly composed of granitic batholith in the continental crust.

6.0 CHAPTER SIX: APPENDICES AND REFERENCES.

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