Visvesvaraya Technological University, Belagavi

A
PROJECT REPORT
on

"Optimization of Underground Electric Cap lamp"

Project Team

NAME OF THE STUDENTS	USN
AMAL K	1GV13MI007
MOHAMMED JILANI	1GV13MI028
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Internal Guide
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2016-2017

DEPARTMENT OF MINING ENGINEERING.

Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

(Formerly Golden Valley Institute of Technology)

Oorgaum, Kolar Gold Fields – 563120.

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

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Department of MINING Engineering

CERTIFICATE

Certified that the project work entitled "optimization of underground electric cap lamp"is a bonafied work carried out by, AMAL.K, MOHAMMED JILANI, WASIM AKRAM, ALAMBASHA in the partial fulfilment for the award of degree of bachelor of engineering in Mining of Visvesvaraya Technological University Belagavi, during the year 2016-2017. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirement in respect of project 10MN85 prescribed for the Bachelor of Engineering degree.

.....	.....	.....
Signature of Guide	**Signature of HOD**	**Signature of principal**
Mr. Paul Prasanna Kumar	**Mr. Saul Dev**	**Dr.Syed Ariff**

Saul Dev
Associate Dean Academic and HR
Dr. T. Thimmaiah Institute of Technology
Oorgaum Post, Kolar Gold Fields - 563 120

Names of the Examiners. Signature with date

1. Dr. SYED ARIFF : 23/6/17
2. Prof MJ Shivalinge : 23/6/17

The Hutti Gold Mines Company Limited

(A Government of Karnataka Undertaking)

CIN No. U85110KA1947SGC001321

Hutti – 584115, Raichur – Dist, Karnataka state.

Date: 19-04-2017

This Certificate is issued to IV Year. VIII Sem. Mining Engineering Students of "DR. THIMMAIAH INSTITUTE OF TECHNOLOGY" KGF on completion of the Project work on "OPTIMIZATION OF UNDERGROUNG CAP LAMP" Vide Permission Letter No HGM/HR/T.S/TRG.STS/1.9/2017/14. Dated: 03/04/2017 Attended Practical Training from 11.04.2017 to 17.04.2017 (05 Days) as per the Schedule Mentioned below:

SL No.	PARTICULARS	DATE	NO OF DAYS
1	Mallappa shaft Battery Room	11-04-2017	01
2	Mallappa shaft battery Room	12-04-2017	01
3	Central Shaft Battery Room	13-04-2017	01
4	Central Shaft Battery Room	15-04-2017	01
5	Village shaft Battery Room	17-04-2017	01

No. of students attended as mentioned below:

SL No.	NAME OF THE CANDIDATE	FATHER'S NAME
1	MOHAMMED JILANI	ISHAK AHMED
2	ALAM BASHA	CHANDA HUSEN
3	WASIM AKRAM	BANDE NAWAZ
4	AMAL K	SAJEEV KUMAR K

Mine Manager
Hutti Gold Mines Co. Ltd.

ABSTRACT

Illumination plays a critical role in mining because miners depend on proper illumination to safety perform their work and to see various mine & machinery related hazard An underground mine is the most difficult environment to illuminate according to the illumination Engineering . A dynamic environments, an underground mine include dust, confined spaces low reflective surface & low visual contrasts. Lighting is critical to miners since they depend heavily on visual cues to spot fall of ground , pinning and striking & slipping & tripping .consequently , illumination greatly affects miner ability to perform their jobs safety

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI - 590018

2017 –2018

A

PROJECT REPORT

On

"ASSESSMENT Of SURFACE DEFORMATION DUE TO UNDERGROUND COAL MINING in JHARIA COAL FIELDS, JHARKHAND USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM)"

Submitted in the partial fulfillment of the requirement of the university for the Award of Degree of

Bachelor of Engineering

In

MINING ENGINEERING

By

K.AMAN SINGH
(IGV13MI021)

KRISHNA KANT SINGH
(IGV13MI065)

AYUSH KUMAR TIWARY
(1GV12MI008)

Under the Guidance of

Mr. ROCK STONEY

Assistance Prof., Dept. of Mining Engineering

Department of Mining Engineering

Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

(Formerly Golden Valley Institute of Technology)

Oorgaum Post, Kolar Gold Fields – 563120

2017-2018

Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Kolar Gold Fields – 563120

DEPARTMENT OF MINING ENGINEERING

Certificate

This is to certify that the Project work entitled

"ASSESSMENT Of SURFACE DEFORMATION DUE TO UNDERGROUND COAL MINING in JHARIA COAL FIELDS, JHARKHAND USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM)"

Is a bonafide work carried out by

K.AMAN SINGH (1GV13MI021)

KRISHNA KANT SINGH (1GV13MI065)

AYUSH KUMAR TIWARY (1GV12MI008)

The students of 8th Semester B.E Mining Engineering, under our supervision and guidance submitted in partial fulfillment of the requirements for the award of Degree of Bachelor of Engineering in Mining of Visvesvaraya Technological University, during the academic year 2016-2017.

Signature of the internal Guide

Mr. ROCK STONEY

Signature of the external Guide

Dr. K.K.K SINGH (Chief Scientist, CIMFR)

SCIENTIST
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DHANBAD-826015

Signature of the HOD

Mr. SAUL DEV

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Associate Dean Academic and HR
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Oorgaum Post, Kolar Gold Fields - 563 120

Signature of the Principal

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K.G.F - 563 120

Dr. SYED ARIFF (Principal of Dr. TTIT)

EXAMINERS

1. Dr. SYED ARIFF. 22/6/17

2. 22/6/17

Visvesvaraya Technological University, Belagavi

A

PROJECT REPORT

on

"STUDY ON THE EFFECTIVENESS AND CHARACTERISTICS OF ANFO BLENDING WITH SLURRY EXPLOSIVE IN BLASTING OPERATION"

Carried Out At

M/s DALMIA CEMENT (BHARAT) LIMITED
Ariyalur district, Tamilnadu

Project Team

NAME OF THE STUDENT	USN
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SANTHOSHKUMAR M	1GV14MI403
SAMUEL A	1GV14MI407
SURESHKUMAR S	1GV10MI032

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2016-2017

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DR. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, Kolar Gold Fields – 563120

DEPARTMENT OF MINING ENGINEERING

Certificate

Certified that the project work entitled **"STUDY ON EFFECTIVENESS AND CHARACTERISTICS OF ANFO BLENDING WITH SLURRY EXPLOSIVE IN BLASTING OPERATION"** is a bonafied work carried out by **AMRUTH KUMAR V USN 1GV14MI401, SANTHOSHKUMAR M USN 1GV14MI403, SAMUEL A USN 1GV14MI407 AND SURESH KUMAR S, USN 1GV10MI032** in the partial fulfillment for the award of degree of **Bachelor of Engineering in Mining Engineering of Visvesvaraya Technological University**, Belagavi during the year 2016-2017. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the Report deposited in the department library. The Project report has been approved as it satisfies the academic requirement in respect of project work prescribed for the Bachelor of Engineering degree.

Signature of **Internal Guide**
(Mr. Vijaya Raghavan P)

for

Signature of **External Guide**
(Mr. Vasudevan, AGM,
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Head of the Department
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Signature of **HOD**
(Saul Dev)

Signature of **Principal**
(Dr. Syed Ariff)

Examiners

1)

2)

Dr. Syed Ariff

Prof M J Shivalingaiah
24/6

ABSTRACT

In olden days the blasting was done by gelatine, dynamites and later it was replaced by ANFO due to its good characteristics such as oxygen balance higher detonation velocity and low cost. slurry explosives are new type of industrial explosives develop from 1980s.The advantages of using slurry explosives on the surface mine gives the good characteristics of explosives, and slurry acts as water resistance, high stability safety and good explosion performance.

In modern days of blasting operation blending ANFO with slurry explosives the comparison has been made with a type of explosive regarding the cost of blasting environmental protection and the safety while using them the project study describes the advantages of blending ANFO with slurry explosive and differentiating the characteristics of explosives and increase the effectiveness [(Fragmentation)(More protection per hole)] and minimizes the environmental effects [Ground vibration and fly rocks, Reduction of fumes control of dust pollution] and reduces the cost of explosives and achieved proper blasting operation towards profitability and optimisation.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JNANA SANGAMA", BELAGAVI-590018

Project Report

On

"MAINTENANCE OF BELT CONVEYOR AND ITS SYSTEM- CASE STUDY"

Submitted in the partial fulfillment of the requirement for the Award of Degree

of

BACHELOR OF ENGINEERING

In

MINING ENGINEERING

By

ANANTHAKRISHNAN.A
(1GV13MI001)

LENINE PRABAKARAN.A
(1GV13MI003)

HARISH.V
(1GV13MI018)

ARJUN.S.A
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2016-2017

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Oorgaum, Kolar Gold Fields – 563120

DEPARTMENT OF MINING ENGINEERING

Certificate

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Signature of **Internal Guide**
(Paul Prasanna Kumar)

Signature of **External Guide**
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Signature of **HOD**
(Saul Dev)
Saul Dev
Associate Dean Academic and HR
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Signature of **Principal**
(Dr. Syed Ariff)

Examiners

1) 23/6/17

2) Prof MJ Shivalinge 23/6/17

ABSTRACT

The Aim of the project is about the maintenance of conveyor belt.

Reconditioning is a process of proceeding extra life is the worn-out parts of the conveyor belt almost all parts of the conveyors can be re-conditioning and the "MAINTENANCE OF BELT CONVEYOR AND ITS SYSTEM" has been given special importance in this project.

In the broadest sense, the purpose of maintenance is to safe guard the investment and therefore it is a continuous and not an intermittent function.

The conveyor belt and other rotating parts are bin operations .patrolling and upkeep of the conveyor pose a challenge to the maintenance engineers. These characteristics problems, encountered in conveyor belt are analysed and solutions for their problems are found out.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI-590018

2016-2017

A

Project Report

On

"A STUDY ON DRILLING & BLASTING TECHNIQUES FOR OPTIMISING FRAGMENTATON OF ROCKS FOR MANUFACTURED SAND (M-SAND)"

SUBMITTED IN THE PARTIAL FULFILLMENT OF THE

REQUIREMENT FOR THE VIII SEMESTER

PROJECT WORK-10MN85 FOR THE AWARD OF DEGREE OF

Bachelor of Engineering

In

MINING ENGINEERING

Submitted by

BODDU LOKESH	1GV13MI066
R SAI NIKHIL REDDY	1GV13MI060
PATHAN KASIM	1GV13MI057
PAVITHRAN P	1GV12MI024

Under the guidance of

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Kolar Gold Fields – 563120

CERTIFICATE

Certified that the Project work entitled "A STUDY ON DRILLING & BLASTING TECHNIQUES FOR OPTIMISING FRAGMENTATON OF ROCKS FOR MANUFACTURED SAND (M-SAND)" is a bonafide work carried out by **BODDU LOKESH – 1GV13MI066, R SAI NIKHIL REDDY – 1GV13MI060, PATHAN KASIM – 1GV13MI057 and PAVITHRAN P – 1GV12MI024** in partial fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of Visvesvaraya Technological University, Belagavi during the year 2016-2017. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The Project report has been approved as it satisfies the academic requirement in respect of Project 10MN85 prescribed for the Bachelor of Engineering degree.

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Signature of the Principal
(Dr. SYED ARIFF)

EXAMINERS

1).....
Dr SYED ARIFF.

2).....

ABSTRACT

Due to rapid development in urban area, use of high strength concrete in the construction industry is increasing rapidly. Mineral admixtures such as Ground Granulated Blast furnace Slag (GGBS), replacing the Ordinary Portland Cement (OPC) by mineral admixtures helps in retaining the natural resources for future generation. In present scenario, replacement of river sand with manufactured sand is almost mandatory due to scarcity of the river sand and some of the States banned lifting of river. The M-Sand has become the replacement for the river sand. In order to manufacture M-Sand the rock material should contain the quartz percentage of between 80 to 90% mainly found in quartzite. The impurities like sulphides and iron oxides make the rocks not much suitable for the mechanized sand manufacturing process. Thrust has to be given to ensure desired size of the fragmentation of the rocks in the quarries by controlled blasting by adopting suitable drilling pattern and use of explosives. The vital factor determining the fragmentation is mainly due to the joint systems in the rock in the quarry. Most of the manufactures have failed to make profit as they could not able to achieve the desired size of fragmentation thus using secondary blasting for the same purpose, thereby incurring additional expenditure besides loss of time. To evaluate the joint system Barton's Rock Mass classification techniques to be adopted to classify the rock mass in the quarries. Based on the number of joints, its orientation and joint filling in the joints the drilling parameters like burden and spacing are to be taken into account. By controlled blasting desired fragmentation is obtained. The other area of concern is to minimise the fly rocks during blasting resulted due to close spacing of drill holes. This study will enable to address the following issues in obtaining the desired fragmentation of rock from the quarries so that the production of M-sand will be manufactured economically:

- Visit to the quarries supplying raw material to M-sand manufacturing plant
- Classification of Joint systems and calculation Q Barton's system
- Study on the drilling patterns used in the quarries
- Examining the explosives used in blasting related field like charging and blasting
- Other related issues arising out of the manufacture of M sand.

"ASSESSMENT OF RESPIRABLE DUST EXPOSURE OF MINE WORKERS IN OPEN CAST LIMESTONE MINES OF SOUTH INDIA"

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF ENGINEEERING

in

MINING ENGINEERING

under

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI

by

A.BOOVARAHAVAN (1GV13MI002)
ARUL KUMAR.D (1GV13MI008)
B.PRIYADHARSHAN (1GV13MI010)
S.ANTONY PRABU (1GV13MI061)

Under

The Internal Guidance of

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CERTIFICATE

Certified that the thesis entitled **"Assessment of Respirable Dust Exposure of Mine workers in Opencast Limestone Mines of South India"** carried out by A. Boovarahavan (1GV13MI002), Arul Kumar .D (1GV13MI008), B. Priyadharshan (1GV13MI010), S. Antony Prabu (1GV13MI061) in the partial fulfillment for the award of degree of Bachelor of Engineering in Mining of Visvesvaraya Technological University, Belagavi. The thesis has been approved as it satisfies the academic requirement in respect of Project 10MN85 prescribed for the Bachelor of Engineering Degree. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library.

Signature of Internal Guide	Signature of HOD	Signature of principal
Mr. Paul Prasanna Kumar	Mr. Saul Dev	Dr.Syed Ariff

Saul Dev
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Names of the Examiners		Signature with date
1. Dr. SYED ARIFF	:	
2.	:	

राष्ट्रीय खनिक स्वास्थ्य संस्थान
NATIONAL INSTITUTE OF MINERS' HEALTH
(An Autonomous Institute under Ministry of Mines, Government of India)

Ref: NIMH/KGF/AD/Student project/2017-18/ 64 Thursday, June 22, 2017

CERTIFICATE

This is to certify that the Project dissertation titled "Assessment of Respirable dust Exposure of Mine Workers in Open Cast Limestone Mines of South India" is submitted towards the partial fulfillment of B.E. Mining, Undergraduate Graduate degree, in Mining Engineering from Visvesvaraya Technological University is an original research work. This research work was carried out by the following students A. Boovarahavan USN-1GV13MI002, Arul Kumar D. USN-1GV13MI008, B. Priyadharshan USN-1GV13MI010 and S. Antony Prabu USN-1GV13MI061 of Department of Mining Engineering, Dr. T. Thimmaiah Institute of Technology, Kolar Gold Field, under my supervision and guidance from 15th March to 22nd June, 2017. This dissertation work is up-to the required standard in terms of contents and presentation. These four candidates had done the above research work in the National Institute of Miners' Health, Kolar Gold field, Registered Office. I wish them all success in life

Chatterjee 22.06.2017

Date: 22.06.2017
Place: Kolar Gold Field

(Debasis Chatterjee)
Assistant Director & In-Charge
National Institute of Miners' Health
Registered Office, Kolar Gold Field

देवाशिस चॅटरजी / Debasis Chatterjee
सहायक निदेशक / Assistant Director
राष्ट्रीय खनिक स्वास्थ्य संस्थान
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ABSTRACT

All major opencast mechanized mining activities produce airborne respirable dust. The major dust producing operations are drilling, blasting, loading, unloading, movement of HEMM on haul roads and transportation. Respirable dust deteriorates the environmental air quality in the mining area & its buffer zone and causes serious health hazards to human habitation.

The respirable dust, are mainly toxic and carcinogenic in nature causing serious health hazard to the exposed workers in the form of occupational disease like silicosis and lungs cancer. The concentration of dust measurement is necessary to evaluate the impact of dust generation due to various mining activity in the surrounding environment. The assessment of respirable dust from various opencast mining operations is necessary for prevention of health risks on miners.

This project focuses on collection of respirable dust by using DGMS approved Personal Dust Sampler (PDS) Side Kick Ex51 for determination of Threshold limit value of respirable and the present dust concentration level in the respective mine 1, 2, 3 & 4. The respirable dust samples were analyzed for free silica by using Fourier Transform Infrared Spectrophotometer (ALPHA-T make) to determine the percentage of free silica and TLV of dust for the respective mine.

To achieve this objective, four opencast Limestone Mines of South India was chosen to collect the site-specific respirable dust sample data and determine the percentage of free silica and TLV for the respective mine. The dust sampling and monitoring was conducted during for all the mines in the month of March, April 2017.

From the measured dust samples the area dust concentration ranged from 0.23 mg/m^3 to 4.82 mg/m^3 for all the four mines. Similarly the personal dust concentration ranged from to be 0.4 mg/m^3 to 2.08 mg/m^3 in all the four mines. The field average dust concentration for area and personal dust was 1.177 mg/m^3 and 1.094 mg/m^3 respectively.

This dust survey covered various mining activities in different locations including overburden loading site, stock yard, loading, drilling, and limestone handling plant. The dust levels were examined to assess miners' exposure to time weighted average respirable dust concentration in different working environment of all the four opencast limestone mines.

Visvesvaraya Technological University, Belagavi

A

PROJECT REPORT

on

"OPTIMIZATION OF BLASTING IN OPENCAST MINES"

Undergoing At

NLC India Limited Mine-I, Neyveli

Project Team

NAME OF THE STUDENT	USN
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2016-2017

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DEPARTMENT OF MINING ENGINEERING

Certificate

Certified that the project work entitled OPTIMIZATION OF BLASTING IN NEYVELI MINE 1" is a bonafied work carried out by , PRADEEP.E **USN** 1GV13MI014, KUMARAN.D **USN** 1GV13MI013 ,VENKATESH.R **USN** 1GV10MI035 in the partial fulfillment for the award of degree of **Bachelor of Engineering in Mining Engineering of Visvesvaraya Technological University**, Belagavi during the year 2016-2017. It is certified that all corrections/ suggestions indicated for internal assessment have been incorporated in the Report deposited in the department library. The Project report has been approved as it satisfies the academic requirement in respect of project work prescribed for the Bachelor of Engineering degree.

Signature of **Internal Guide**
DR.SYED ARIFF
(PRINCIPAL)

CHIEF MANAGER

Signature of **External Guide**
VAIDYANATHAN.B
(CM/BLASTING/Mine –I)

Signature of **HOD**
(Saul Dev)

23/6/17

Signature of **Principal**
(Dr. Syed Ariff)

Examiners

1) Dr. Syed Ariff 23/6/17

2) Prof MJ Shivalingaiah 23/6/17

ABSTRACT

Drilling and blasting are the major unit operations in opencast mining. Inspite of the best efforts to introduce mechanization in the opencast mines, blasting continue to dominate the production. Therefore to cut down the cost of production optimal fragmentation from properly designed blasting pattern has to be achieved. Proper adoption of drilling and blasting can contribute significantly towards profitability and therefore optimization of these parameters is essential. Hence advance preparation to remove the hard strata with Neyveli Mine-I has to be removed by adopting well design pattern of drilling and blasting. About 60% of total overburden is to be blasted, benchwise. In surface Bench 100% of overburden excavated is blasted. In Top and Middle benches 100% to 50% of overburden excavated is blasted.

Drilling equipments are selected taking into account the depth of holes, the varying conditions of the overburden, hits hardness and sub soil water. After a series of trials, an optimum set of drilling patterns has been evolved for different and varying horizons.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JNANA SANGAMA", BELAGAVI-590018

Project Report

On

"ANALYSIS OF DIFFERENT LIGHT SOURCE IN UNDERGROUND MINES"

Submitted in the partial fulfillment of the requirement for the Award of Degree of

BACHELOR OF ENGINEERING

In

MINING ENGINEERING

By

DEIVA PRAGASAM.K
(1GV13MI022)

VINOTH KUMAR.R
(1GV13MI038)

RAMACHANDRAN.C
(1GV14MI029)

Under the Guidance of

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Dr. TTIT, KGF

External Guide

Mr. P. VIKRAM
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Department of Mining Engineering
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2016-2017

DR. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, Kolar Gold Fields – 563120

DEPARTMENT OF MINING ENGINEERING

Certificate

Certified that the project workentitled"**ANALYSIS OF DIFFERENT LIGHT SOURCES IN UNDERGROUND MINES**"is a bonafied work carried out by DEIVA PRAGASAM.K **USN** 1GV13MI022, VINOTH KUMAR.R **USN** 1GV13MI037 **AND** RAMACHANDRAN.C **USN** 1GV12MI029 in the partial fulfillment for the award of degree of **Bachelor of Engineering in Mining Engineering of Visvesvaraya Technological University**,Belagavi during the year 2016-2017.It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the Report deposited in the department library. The Project report has been approved as it satisfies the academic requirement in respect of project work prescribed for the Bachelor of Engineering degree.

Signature of **Internal Guide**
(J.RONALD LAWRENCE)

Signature of **External Guide**
(P.VIKARAM)

Signature of **HOD**
(Saul Dev)

Saul Dev
Associate Dean Academic and HR
Dr. T. Thimmaiah Institute of Technology.
Oorgaum Post, Kolar Gold Fields - 563 120

Signature of **Principal**
(Dr. Syed Ariff)

Examiners

1)

2)

ABSTRACT

This paper presents general requirements of lighting including sources of lighting in surface and underground mines. Performance of various lighting sources such as sodium vapor lamps, tungsten filament, incandescent, fluorescent, mercury vapor, metal halides etc are discussed. Regulations related to mine lighting and advantages of LED system of lighting over conventional system are also discussed in detail. Iluminance Measuring techniques and instrumentation for conducting illumination survey are briefly enumerated. Illumination levels at different working places in Tirap open cast coal mine, NEC, a subsidiary of Coal India Limited are illustrated. Comparison between Conventional Sodium/ Mercury vapor lamps Vs. LED Light is presented emphasizing the importance of application of LED system of lighting for effective energy conservation, better illumination, resistant to shock and vibration

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
"JANA SANGAMA"

Project Report

On

"IMPROVING STABILITY OF DUMP PILES IN OPEN CAST MINES-CASE STUDY"

Submitted in the partial fulfillment of the requirement for the Award of Degree of

BACHELOR OF ENGINEERING

In

MINING ENGINEERING

By

VINOTH KUMAR.E
(1GV13MI015)

RAJASEKAR.S
(1GV13MI040)

MURUGESH.R
(1GV13MI059)

R. JAIGANESH
(1GV13MI063)

Under the Guidance of

DR.SYED ARIFF.,

Principal.,Dr.T.T.I.T

Department of Mining Engineering

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(Formerly Golden Valley Institute of Technology)

Oorgaum Post, Kolar Gold Fields – 563120,

2016-2017

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Certified that the project workentitled"**IMPROVING STABILITY OF DUMP PILES IN OPEN CAST MINES -CASE STUDY**" is a bonafied work carried out by **VINOTH KUMAR.E USN 1GV13MI015, RAJASEKAR.SUSN 1GV13MI040, MURUGESH.R USN 1GV13MI059 AND R.JAIGANESH USN 1GV13MI063** in the partial fulfillment for the award of degree of **Bachelor of Engineering in Mining Engineering of Visvesvaraya Technological University**, Belagavi during the year 2016-2017.It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the Report deposited in the department library. The Project report has been approved as it satisfies the academic requirement in respect of Project work prescribed for the Bachelor of Engineering Degree.

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Examiners

1) 23/6/17 Dr. Syed Ariff

2) Prof MJ Thimmaiah

ABSTRACT

Stability of overburden dumps plays as integral part of opencast mine project throughout the operation process. Waste dumps always have steep angled slopes as the waste has been tipped over from the top of the dump in a continuous and progressive manner. For new landfill it is often desirable to design steep slopes as it can accommodate the maximum amount of waste possible. The heavy machinery implanted for the extraction and transportation of wastes in the open cast mine whose management is of prime importance. The problems relating to overburden dump slope stability is catching attention for safe working in adverse natural constraints. This study examines the geotechnical properties of various parameters such as sample properties like cohesion, angle of internal friction, density , moisture content,grain size distribution,permeability etc. The analysis covers various sections of the waste dumps from the mine including material properties, strength values, bench height and angle. Most of the design methods are purely based on field experience, followed by sound engineering judgment. overburden dump should be safe and economic in its purpose. The primary aim of the construction of the overburden dump is to provide effective stable working condition in the mines and proper handling of the overburden. The good design of overburden dump prevents accidents and environmental friendly. The dump failures are mainly due to poor construction and design. A good design of stability ultimately leads to safe operations, worker's safety, higher productivity, efficiency and profitability.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI – 590018

A

Project Report

On

"MOVEMENT AND SURVEYING OF SURFACE MINE SLOPES BY USING SLOPE STABILITY RADAR"

Submitted in the partial fulfillment of the requirement of the university for the Award of Degree of

Bachelor of Engineering

In

MINING ENGINEERING

By

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2016-2017

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Dr. SYED Ariff.

2)Prof MJ Shivalingaiah 23/6

ABSRACT

Determining slope stability in a mining operation is an important task. This is especially true when mine working are close to a potentially unstable slope. A common technique to determine slope stability is to monitor the small precursory movements which occurs prior to collapse. The "SLOPE STABILITY RADAR" has been developed to remotely scan a rock slope to continuously monitor the spatial deformation of the face. Using differential radar interferometry, the system can detect deformation movements of a rough wall with submillimetric accuracy, and with high spatial and temporal resolution. The effects of atmospheric variations and spurious signals can be reduced via signal processing means. The advantage of radar over other monitoring techniques is that it provides full area coverage without the need for mounted reflectors or equipment's on the wall. In addition the radar waves adequately penetrate through rain, dust, smoke to give a reliable measurements, 24 hours a day. The system has been trailed at three open cut coal mines in Australia, which demonstrated the potential of real time monitoring of slope stability during active mining operations.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI-590018

2016-2017

A

Project Report

On

"FLY ROCK ISSUES IN MINING DUE TO BLASTING"

SUBMITTED IN THE PARTIAL FULFILLMENT OF THE

REQUIREMENT FOR THE VIII SEMESTER

PROJECT WORK-10MN85 FOR THE AWARD OF DEGREE OF

Bachelor of Engineering

In

MINING ENGINEERING

Submitted by

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ABSTRACT

Blasting operations are an essential element in the recovery of our Nation's mineral resources. The mining industry uses billions of pounds of explosives annually. The majority of blasting occurs in surface mining operations. Blasting results in the fragmentation and often the projection of rocks. Frequently, the rocks are thrown beyond the expected limits. Flyrock and failure to secure the blasting area dominate blasting-related accidents in mining, especially in surface mining. Blasting accidents in the mining industry tend to result in critical injuries or fatalities. Flyrock is one of the most contentious issues in bench Blasting. Unlike ground vibrations, flyrock has thepropensity to cause fatality and severe injuries.Although the kinematic equations present a basis forthe estimation of flyrock distance, these suffer fromthe drawback of ignoring the post-release effects oftrajectory motion in air. Predictive models that arebased on such equations not only suffer from thisanomaly, but also fail in flyrock distance predictiondue to the gross approximations of initial velocitycalculations and shape of the fragments

Visvesvaraya Technological University, Belagavi

A

PROJECT REPORT

on

"ULTRA DEEP MINING"

Undergoing At

Dr. TTIT, KGF

Project Team

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2. Prof MJ Shivalingaiah : MJ 24/6/17

ABSTRACT

Deep underground metal mines are the source of the specialized metals including nickel, chrome, molybdenum, lead, zinc, platinum and palladium – that are essential for the modern industrial economy. While the supply of commodity metals such as iron, aluminum and copper generally come from very large open pit mines, the specialized metals are largely produced by deep underground mines (2km below surface)

The need to fundamentally shift the design, development and operation of underground metal mines is driven by three converging factors:

- The need for many of the large open-pit copper mines in the world to go underground while sustaining unchanged production levels
- The need to pursue specialised industrial metals to ever greater depths
- The need to attract a new generation of well educated

The goal of the ULTRA DEEP MINING is to help the mining develop and adopt commercially viable research and developments that result in the deployment of proven innovative technologies.

As mining operations go deeper, streamlining operations is critical because it takes longer to trans-port workers and materials into the mine and to their work place. Similarly, the transportation logistics of ore, waste and fill material from these same work headings increases proportionally as mines go deeper.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI – 590018

A

Project Report

On

"SHOVEL AND TRUCK OPTIMIZATION BY OVERALL EQUIPMENT EFFECTIVENESS AND MATCH FACTOR"

Submitted in the partial fulfillment of the requirement of the university for the Award of Degree of

Bachelor of Engineering

In

MINING ENGINEERING

By

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UDAY KUMAR POAL	**1GV13MI048**
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ABSTRACT

The transport of material from production faces to dumping sites is accomplished by rail, truck, belt conveyor or hydraulic transportation in mines. The most common transport method in surface mining is Shovel-Truck combination. This operation basically constitutes about 50 to 60% of total operating costs in surface mining. It is necessary to use shovel truck combination efficiently for improving economy in the mining sector. Various techniques are available to analyse and optimize the combination. This project describes and suggests the Shovel-Truck operation optimization approaches by applying Overall Equipment Effectiveness (OEE) and matching simultaneously. This approach would provide the capability of estimating system performance measures (mine output, mean number of trucks, mean waiting time, etc.) for planning purposes when the truck fleet is composed of identical trucks. A computational study is presented to show how choosing the optimum number of trucks and optimum dispatching policy affect the cost of moving material in a Truck-Shovel system. The average value of the monthly production is considered for determining the productivity of Truck-Shovel system.

A PROJECT REPORT
On

"ERGONOMIC ASSESMENT OF ILLUMINATION IN WORKING AREAS of OPENCAST MINES IN SOUTH INDIA"

Undergoing At

National Institute Of Miners Health, KGF

Project Team

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2. : Prof MO/Shivalingaiah 23/6/17

राष्ट्रीय खनिक स्वास्थ्य संस्थान
NATIONAL INSTITUTE OF MINERS' HEALTH
(An Autonomous Institute under Ministry of Mines, Government of India)

Ref. NIMH/KGF/AD/Student project/2017-18/65 Thursday, June 22, 2017

CERTIFICATE

This is to certify that the Project dissertation titled "Ergonomic Assessment of Illumination in the Working Zones of Open Cast Mines located in South India" is submitted towards the partial fulfillment of B.E. Mining, Undergraduate Graduate degree, in Mining Engineering from Visvesvaraya Technological University, is an original research work. This research work was carried out by the following students Premkumar B. USN-1GV13MI009, Praveen Raj M. USN-1GV13MI034, Kannan V. USN-1GV13MI049 and Kalaiarasan G. USN-1GV13MI053, Mining Engineering Department of Dr. T. Thimmaiah Institute of Technology, Kolar Gold Field, under my supervision and guidance from 1st March to 22nd June, 2017. This dissertation work is up-to the required standard in terms of contents and presentation. These four candidates had done the above research work in the National Institute of Miners' Health, Kolar Gold field, Registered Office. I wish them all success in life

Chatterjee 22.06.2017

Date: 22.06.2017
Place: Kolar Gold Field

(Debasis Chatterjee)
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ABSTRACT

Mechanization & shift work for excavation of minerals in mining necessitates the illumination of working areas in open cast mines from sun set to sun rise.Illumination plays a critical role safety & better work output in the operation of HEMM & other mining equipment in the evening and night shifts.As per USBM on illumination many issues like human factors, visibility, visual acuity, luminance, intensity, light colour, scattering effect of light were considered in details to make the illumination regulation of open cast mines.Thepresent research on illumination technology includes energy saving by implementing light emitting diodes (LEDs). However research is still in progress regarding the viability of LEDlights in mine illumination & its impact on human vision. Adequate illumination safe visual working environment is a challenge faced by modern mechanized mining industries for increasing the production in night shifts. The critical problem of illumination is because of low reflectance, high absorbance of light and dark surroundings /backgrounds. Effective optimal illumination level is required in night shifts to achieve target production and ensure safe operations of various HEMM &other mining machineries in different working locations & haul road of mines. Open-cast mines covers large area and the topography of these mines changes continuously with day to day mine development & production activities so implementation of mobile tower lights & monitoring of illumination level on regular basis is necessary to cope up with the lighting pattern of changing working scenario in the mine.The basic purpose of this study is to carry illumination studies as per MMR regulation 148(2) of 1961 and DGMS technical circulars and guidelines. This study is undertaken by NIMH to determine compliance with the above provisions of statute as requested by the Mine Management for the following objectives.To measure illumination levels at mine pit, near HEMM equipment, workplaces, haulage roads, crushing & screening plant etc.To provide safe working environment where artificial lights are provided /natural light is insufficient to carry out production activity. To increase the production & ensure safety in mine by providing optimal lighting at work site, reduce glare & light pollution. Illumination monitoring was carried out using standard Digital Lux Meters. The intensity of light was measured in lux unit. The illumination levels of different working locations were measured directly in Lux, as per standard procedures DGMS regulation 148(2) of MMR 1961.The primary objectives of the project were to study illumination requirement of various workplaces and to develop appropriate illumination designs for various places of work in the mine vis-à-vis DGMS standards.

VISVESHVARAYA TECHONOLGICAL UNIVERSITY
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2016-2017

Project synopsis
On
"RFID and Pose Invariant Face Recognition Based Automated Security System"

Submitted in the Partial Fulfillment of the Requirement for the 8th Semester, Project Work-10ECP85 for the Award of Degree of Bachelor of Engineering
In
Electronics & Communication Engineering

Submitted by:

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3. SUDHIG	3. 24/6/17

SYNOPSIS

Conventional methods of using Barcodes that requires line of sight, pricing discrepancies, scanning problems, label damage, financial and equipment cost causes inaccuracy in entering the information and barcode scanners eventually breakdown causing scanning problems. Therefore, Radio Frequency Identification (RFID) technology is proposed that uses radio waves to transfer from an electronic tag called RFID tag, attached to an object, through a reader for the purpose of identifying and tracking the object. RFID technology which is a matured technology that has been widely deployed by various organization as a part of their automation system. In this study, an RFID based system has built in order to produce a compact and reliable smart security system using RFID and face verification is presented here.

The RFID system identifies the student using the RFID card and further identity verification of the student is carried out using face recognition technique. RFID uniquely identifies the student based on the card number, then Viola- Jones algorithm is used to verify face of the students using face image of the student. The performance of the system is carried out with RFID code and face recognition.

A Project Report on

"Ergonomic Analysis of Whole Body Vibration Exposure of Miners' Operating HEMM & Other Mining Equipments in Opencast Mines of South India"

Thesis Submitted for Partial Fulfillment of Degree in BE mining By

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At Visvesvaraya Technological University, Belagavi

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Certified that the project work entitled "Analysis of Whole Body Vibration Exposure on Miners' Operating HEMM & Other Mining Equipments in Opencast Mines of South India"is a Bonafide work carried out by, ALEN RAHUL RAJ A, KARTHICK M, SAI VIVEK E, NITISH KUMAR in the partial fulfilment for the award of degree of bachelor of engineering in Mining of Visvesvaraya Technological University Belagavi, during the year 2016-2017. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirement in respect of project 10MN85 prescribed for the Bachelor of Engineering degree.

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Ref. NIMH/KGF/AD/Student project/2017-18/ Thursday, June 22, 2017

CERTIFICATE

This is to certify that the Project dissertation titled "Ergonomic analysis of whole body vibration exposure of miners operating HEMM and other mining equipment in the open cast mines of South India" is submitted towards the partial fulfillment of B.E. Mining Undergraduate Graduate degree in Mining Engineering from Visvesvaraya Technological University is an original research work. This research work was carried out by the following students Alen Rahul Raj A. USN-1GV13MI006, Karthick M. USN-1GV13MI025, Sai Vivek E. USN-1GV13MI043 and Nitish Kumar USN-1GV13MI067 of Department of Mining Engineering, Dr. T. Thimmaiah Institute of Technology, Kolar Gold Field, under my supervision and guidance from 1st March to 22nd June, 2017. This dissertation work is up-to the required standard in terms of contents and presentation. These four candidates had done the above research work in the National Institute of Miners' Health, Kolar Gold field, Registered Office. I wish them all success in life

Debasis Chatterjee 22.06.17

Date: 22.06.2017
Place: Kolar Gold Field

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ABSTRACT

The operators of HEMM & other mining equipment in Indian mining industry are having prolonged exposure to segmental vibration and whole body vibration (WBV) while operating mining equipments. It is necessary to monitor WBV measurement exposure of HEMM operators to manage the risk from numerous adverse health effects of vibration exposure. The WBV monitoring is carried out in mines in order to satisfy the 10^{th} safety conference recommendation for the protection of mine workers from WBV exposure in various mining operation.

The WBV is typically measured using a Tri-axial accelerometer seat pad which measures the magnitude of acceleration for the vibration signals in x, y and z axis. The reading from the accelerometer seat pad is collected by vibration meter model HVM 100 make Larson & Davis. The objective of this study is to analyse the risk involved due to WBV exposure of mine workers. The present study was carried out to determine the WBV exposure in three opencast mines operators' operating heavy earth moving machineries and other mining equipment which operates in cyclic or Non-cyclic manner, such as Back hoe, Dumpers, Dozers, Tippers, Shovels, Rock breaker, Wheel loaders etc.

This study was performed on 25 tipper operators, 3 Dozer operators, 8 back hoe operators, 3 Dumper operators, 2 Rock breaker & grader operator. The WBV data was collected by using HVM100 and the data was analysed with the help of Health caution guidance zone curve as per ISO 2631-1:1997. It was observed that one ripper dozer, one Dozer and 4 wheel loaders fall under the caution zone of High health risk. It was further observed that operators of 2 ripper dozers, 2 rock breakers, 2 Back hoes, 3 wheel loaders and 2 graders fall under the zone of moderate Health risk and remaining operators operating 6 Back hoes fall under Minimal Health risk caution Zone.

The analysis of WBV data as per RMS acceleration values reveals that operators of 17% of cyclic & 26% of non cyclic HEMM & other mining equipment fall under high health risk category. The moderate health risk category includes the operators of 73% cyclic & 41% non cyclic HEMM & other mining equipment. The remaining 10% cyclic & 33% non cyclic HEMM & other equipment operators fall under minimal health risk caution zone. The WBV exposure of HEMM & other mining equipment whose linear crest factor is > 9 was further analysed as per VDV_T values. The WBV exposure of operators as per VDV_T values reveals that 3% is exposed to high health risk, 37% moderate health risk and remaining 60% were exposed to minimal health risk. As per this WBV study the high health risk mining equipment were Tipper, wheel

Visvesvaraya Technological University, Belagavi

A

PROJECT REPORT

on

"STUDY OF LDBH STOPING METHOD IN UNDERGROUND METALLIFEROUS MINES"

Undergone At

HUTTI GOLD MINES

Project Team

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CERTIFICATE

Certified that the project work entitled "Study on EDBH STOPING IN UNDERGROUND METALLIFEROUS MINES"is a bonafied work carried out by, ENIYAN.T, POONAM KUMAR J. SIKENDER, FAROOQ in the partial fulfilment for the award of degree of bachelor of engineering in Mining of Visvesvaraya Technological University Belagavi, during the year 2016-2017. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirement in respect of project 10MN85 prescribed for the Bachelor of Engineering degree.

24/6/2017

Signature of Guide	Signature of HOD	Signature of Principal
Mr. Paul Prasanna Kumar	Mr. Saul Dev	Dr. Syed Ariff

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ABSTRACT

Method of stoping is an important operation involved in metalliferous mines. In general 70% of mine production is achieved from their operation. Stoping operation involve dangerous situation with respect to the ground stability, ventilation, temperature and other aspects of the mine environment. Endangering the safety of the person employed in the mines. Particularly in conventional method of mining, person are exposed to fresh excavations. Old conventional methods were practiced extensively till 19th century. Later on many underground metalliferous mines changed the method of mining which suits to the latest technology by developing more machinery.

Adopting mechanization has proved well in abroad as well as in some of Indian mines. The timely advancement in technology of latest techniques of drilling & blasting in mines is necessary in order to save economy and time. Safety blasting also matters a lot in mining especially in underground metalliferous mining. There are many methods where unmanned situation are unavoidable. The aspect of mining is obtained high production in less time and in a safe manner mainly in underground mining. In sub-level stoping we adopt various types blasting large dia. Blasthole method, open ended method and VCR method (Vertical Crater Retreat). Classical mining method will teach us ring hole drilling is more productive than parallel drilling. But in vertical carter retreat method we use parallel holes drilling method of mining in underground mines that is of blasting. In this method horizontal slice blasting of ore body with near spherical charges into the undercut is under taken and the slices are removed in upward direction. The LDBH stoping method itself is the gravity and sequence and time laps of blasting we adopt in sub-level stoping method.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI – 590018

A

Project Report

On

"PREDICTION AND ASSESSMENT OF GROUND VIBRATIONS DUE TO BLASTING"

Submitted in the partial fulfillment of the requirement of the university for the Award of Degree of

Bachelor of Engineering

In

MINING ENGINEERING

By

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Under the Guidance of
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EXAMINERS

Dr SYED ARIFF
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23/6/17

Prof M.T Ahivalagan
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23/6/17

ABSTRACT

The present study mainly deals with the prediction and assessment of blast-induced ground vibration carried out at a power project site at odisha. In recent days, due to increase in demand for extraction/excavation for foundation for construction activities, the use of explosives has increased in a systematic way to reduce the adverse impacts on the structures. In engineering applications of explosives for rock breaking, the released energy is used for rock breakage & fracturing, the remaining energy is converted to heat, seismic waves, and air over pressure. Out of various hazards blast induced ground vibration and air over pressure are the most damaging factors. In order to predict the outcome of the blast, one must be able to predict the effect of blast at required locations. The impacts of blasting such as ground vibration and air over pressure are measured using the electronic instruments and simultaneously the recorded data is analysed using the software.

The energy distribution is significantly controlled by the blast constriction. Ground vibrations are measured in PPV (mm/s) & this PPV is influenced with respect to maximum charge per delay between the blast location and the monitoring location, these two plays a vital role in damaging the structures. Based on the permissible limits of ground vibration as per DGMS standards, the diameter of blast hole is decided.

Studies revealed that when the structures are at a distance of 120 m or more, 38 mm diameter blasting has to be adopted. If the structures are within 50m distance blasting should not be done.