

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2018-2019



A Project Report

on

“AUTOMATION OF LOW PROFILE DUMPING TRUCK”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

Mining Engineering

By

| | |
|-----------------------------|-------------------|
| HEMASHEKAR N | 1GV15MI014 |
| SHIVAKUMAR GUDUGUNTI | 1GV15MI051 |
| AMARESH Y | 1GV16MI400 |

**Under the Guidance of
Mr. PAUL PRASANNA KUMAR
Associate Professor,
Department of Mining, Dr. TTIT, KGF.**



Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Formerly Golden Valley Institute of Technology)

Department of Mining Engineering

Kolar Gold Fields – 563 120



(Formerly Golden Valley Institute of Technology)
Oorgaum Kolar Gold Fields - 563 120
DEPARTMENT OF MINING ENGINEERING

CERTIFICATE

Certified that the **Project work** entitled "**AUTOMATION OF LOW PROFILE DUMPING TRUCK**" is a bonafied work carried out by **Hemashekar N (USN-1GV15MI014)**, **Shivakumar Gudugunti (USN-1GV15MI051)** and **Amaresh Y (USN-1GV16MI400)** and in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project Work-15MNP85** prescribed for the Bachelor of Engineering Degree.

Signature of Guide

Mr. PAUL PRASANNA KUMAR

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Signature of Principal

Dr. SYED ARIFF

Name of the Examiner

- 1) **Vijay Raghavan**
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- 1) **Vijay Raghavan 14/6/19**
- 2) **Manas Mukhopadhyay 14.6.19**

ABSTRACT

An underground mining operation has changed according to the evolution and the transportation system in underground mining is one of the important roles. The underground transportation of ore, men and materials has been developed from olden days from manually operated to Highly mechanized and at present the automation which is being rapidly growing and the progress in automation technology has led in increase of production and productivity. There are many kinds of transportation system adopted in underground mining mainly gravity transportation system, conveyor system, and locomotive system and the low-profile dumpers. Low Profile Dumping Truck (LPDT) used at present in shallow depth underground mines has found many modification in its design and operation system, but many of the accidents and other problems regarding operation of the truck has noticed keep the safety and production in point of view the project aims in building of the automated low profile dumping truck and other machinery like LHD (load haul dumper) has already done with automation and working efficiently, presently Sandvik and Volvo are working on automation which clearly shows the future is with automation.

Visvesvaraya Technological University
Belagavi, Karnataka-560 018
2018-2019



“DOUBLE WHEEL BUCKET EXCAVATOR”

Project Report
(15MNP85)

Submitted by

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in partial fulfillment of the requirement for the award of the degree of

Bachelor of Engineering in
Mining Engineering

Under the Guidance of
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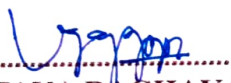
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CERTIFICATE

It is certified that the Project work entitled “*Double Wheel Bucket Excavator*” is a bonafide work carried out by ANIKETH A A (1GV15MI003), RAHUL N (1GV15MI038), SAGAR GOWDA R (1GV15MI045), SRIDHAR N (1GV15MI053) in the partial fulfillment of the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2018-19. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project work has been approved as it satisfies the academic requirements in respect of Project work – 15MNP85 prescribed for the Bachelor of Engineering Degree.


Mr. VIJAYA RAGHAVAN
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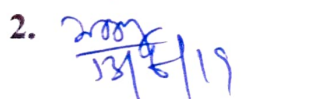

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Visvesvaraya Technological University
Belagavi, Karnataka-560 018
2018-2019



“DOUBLE WHEEL BUCKET EXCAVATOR”

Project Report
(15MNP85)

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in partial fulfillment of the requirement for the award of the degree of

Bachelor of Engineering in
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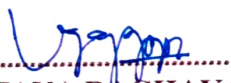
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It is certified that the Project work entitled “*Double Wheel Bucket Excavator*” is a bonafide work carried out by ANIKETH A A (1GV15MI003), RAHUL N (1GV15MI038), SAGAR GOWDA R (1GV15MI045), SRIDHAR N (1GV15MI053) in the partial fulfillment of the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2018-19. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project work has been approved as it satisfies the academic requirements in respect of Project work – 15MNP85 prescribed for the Bachelor of Engineering Degree.


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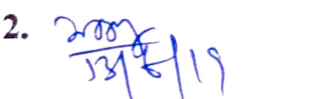

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ABSTRACT

Bucket wheel excavator is the heaviest land based vehicle ever constructed by man which is used to remove thousands of tons of overburden a day. But a single buckets wheel excavator will cost crores of capital investment, hence having two or more bucket wheel excavators will be expensive even including their maintenance and power supply. So, our project purpose is to design the bucket wheel excavator through which the work of two bucket wheel excavators can be achieved by a single machine. By doing this we can reduce power consumption considerably, can reduce maintenance cost and also can reduce personnel to supervise. According to our research and collected data, installing another bucket wheel to the same boom which will be driven by the motors that drives the other bucket wheel and all the excavated material will be carried by the same conveyor belt. The result obtained by calculating the theoretical capacity we obtain $0.6912\text{m}^3/\text{hr}$ for a single wheel bucket excavator and by installing two bucket wheels we get $1.3824\text{m}^3/\text{hr}$ the result of calculated theoretical capacity shows that the installation of double wheel bucket can double the production over the traditional single bucket wheel so it promises that double wheel bucket excavator is more efficient and effective than the traditional BWEs in both production and cost prospective.

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2018-2019



**A Project Report
on**

**“GROUNDWATER MANAGEMENT IN AND
AROUND NLCIL MINES”**

Submitted in partial fulfillment of the requirement for
the VIII semester project work 15MNP85 for the award of the degree of

Bachelor of Engineering

In

Mining Engineering

Submitted By

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Certified that the **Project work** entitled "*Groundwater management in and around NLCIL mines*" is a bonafide work carried out by **ARAVIND RAJ G (USN-1GV15MI005), ASHOK KUMAR K (USN-1GV15MI007), JANARTHAN V.R (USN-1GV15MI017) and SHIVA PRAKASH S.M (USN-1GV15MI068)**, in the partial fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University**, Belagavi during the year 2018-2019. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work - 15MNP85** prescribed for the Bachelor of Engineering Degree.

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Signature of Guide
Dr. Ramesh K

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Dr. Syed Ariff
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2. Dr. Hanas Muthupadhi

1. Vijay Raghavan 13/6

2. 2002
13/6/19

ABSTRACT

Water is one of the basic needs of the mining industry. All the operations of mining, directly or indirectly require water for their functioning. The cuddalore coastal aquifer system (neyveli coastal aquifer system) is the most productive aquifer in the Tamilnadu state as well as in the country. Continuous groundwater withdrawal for the last 5 decades for agricultural and mining activities has impact on the cuddalore aquifer system and there always exists a threat of sea water intrusion along the coast. In NLCIL mines, for mining one tonne of lignite about 13 tonnes of water has to be pumped out and large amount of water is taken, this leads to fluctuation in the water table level, for this the groundwater management should be done like artificial recharge, periodic ground water monitoring and test borehole studies to carried out to avoid salt water intrusion and fluctuation in the water table level in and around Neyveli area.

Visvesvaraya Technological University
Belagavi, Karnataka-590 018
2018-2019



A Project Report
On

***“RETREATMENT OF GOLD MILL TAILINGS AT K.G.F TO
RECOVER RESIDUE GOLD AND RE-USE WASTE MATERIAL FOR
CONSTRUCTION INDUSTRIES”***

Submitted in partial fulfillment of the requirement for the VIII semester
Project work- 15MNP85 for the award of the degree of

Bachelor of Engineering
In Mining Engineering

By,

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| DEVARAJ G S | 1GV16MI403 |
| MANOJ M | 1GV16MI404 |
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Under the Guidance of

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Certified that the **Project work** entitled *“Retreatment of Gold Mill Tailings at K.G.F to Recover Residue Gold and Re-Use Waste Material for Construction Industries”* is a bonafide work carried out by **Deepak Kumar K (1GV14MI013), Devaraj G S (1GV16MI403), Manoj M (1GV16MI404), Madhusudhana S (1GV16MI405)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project Work -15MNP85** prescribed for the Bachelor of Engineering Degree.

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Dr. SYED ARIFF

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- 2) Dr. Manoj Mukhadas

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- 2) Dr. Manoj Mukhadas 18/6/19

ABSTRACT

Gold mining was started at KOLAR GOLD FIELDS back in the distinct past, since that time a total quantity of 800 tonnes of gold has been extracted and during the process more than 30 million tonnes of tailings are produced and it has been dumped all around the K.G.F those tailings are accumulated an area of about 2km² which is the 10% of total area of the township. These tailing dumps are creating environmental problems one of the solutions to these problem is to use the mill tailings for some useful purpose. Although most of these tailing dumps contain less than 1 gm/tonne of gold, the technology now exist is to treat the tailings profitably.

This report describes the extraction of gold by CARBON IN LEACH/PULP Method to extract the residue gold in the Kennedys dump which is about 10.09 tonnes and re-use the material for construction industries like brick making by adding some additives to the tailings and replacing river sand by mill tailings in the concrete mixes. By using this waste instead of conventional materials, which would preserve the natural resources and solve the waste disposal problem. Construction of buildings from ore waste is eco-friendly as it utilizes waste and reduces air, land, and water pollution.

Visvesvaraya Technological University
Belagavi, Karnataka-590 018
2018-2019



A Project Report
on
“ANALYSIS OF ROOF BOLT PERFORMANCE IN UNDERGROUND
MINE BY FINITE ELEMENT METHOD”

Submitted in the partial fulfillment of the requirement for the
VIII Semester Project Work-15MNP85 for the award of degree of

Bachelor of Engineering

in

Mining Engineering

By

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Signature of guide
Mr. Vijaya Raghavan P

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Name of Examiners

1. Vijay Raghavan
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ABSTRACT

The project is about the numerical simulation of the roof bolting technology used in underground mines, which is now employed in many mines for the better, accurate and faster growth of the company economically and also in safety factor

Roof bolting can be ranked as one of most important technological developments in the field of ground control in the entire history of mining, which is a primary support, provides strong roof strata and prevents many danger as well economically feasible support systems employed in underground mines. Many mines have a problem of roof collapse both in metal and coal mines, it is due to improper bed layer, increase in roof pressure and different pressures acting so to prevent the problem and avoid accidents many underground mines have employed roof bolting support in mines, the support is a smaller type of support so access of roadways is easier.

FLAC 3D is software which is used for modeling the roof bolt with all the required specifications; we use “finite element analysis” for modeling, which gives a best result for a greater support. The required data’s are collected by a field visit to an underground mine and the required data are collected as per for modeling.

There is no much difference in the analytical method of field data observation and Numerical simulation method of field data observation while comparison on the axial load and the stress distribution on depillaring area and developments with continuous miner technology.

The method of project carried out is briefly explained in the report. This project is a great opportunity to shape our future and sharpen our brains and I assure to give an efficient effort to build an enormous future with the knowledge I acquire by this project and this project is a Asset for our future career.

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2018-2019



“AUTOMATED FIRE FIGHTING ROBOT FOR SAFETY IN MINES”

Project Report

(15MNP85)

Submitted by

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MANOHAR A

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R M KASHI VISHWANATH

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SANDESHA B K

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Bachelor of Engineering in

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Under the Guidance of

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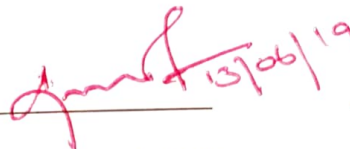
CERTIFICATE

It is certified that the **Project work** entitled "**AUTOMATED FIRE FIGHTING ROBOT FOR SAFETY IN MINES**" is a bonafied work carried out by **Imran S M (1GV15MI015), Manohar A (1GV15MI023), R M Kashi Vishwanath (1GV15MI036), Sandesha B K (1GV15MI046)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project work 15MNP85** prescribed for the Bachelor of Engineering Degree.



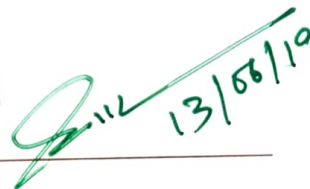
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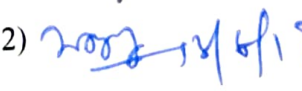
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ABSTRACT

A Robot suitable for automatically extinguishing the fire during fire accidents in mines is presented in this paper. The Robot moves in the direction with respect to the fire intensity and avoids self-destruction that is capable of withstanding very high temperatures. The flame sensing capability of the robot is varied by heating the Thermocouple ends to a cut-off temperature, above which the robot starts responding to the fire. The Robot finds its applications in Rescue operations during fire accidents, in underground coal mines and surface mines, where the possibility for service workers to enter the fire prone areas is very less and also during wars to perform rescue functions. The most added advantage of this Robot is that it turns ON automatically as it detects the fire within a distance of 5-10cms, using Thermocouple, and tries to extinguish it by moving in the direction with respect to the fire intensity. The temperature sensor provides a backup to the Thermocouple, if needed in vast circumstances.

Keywords: Non-Inverting Amplifier, Comparator, Obstacle Avoider, IC 741 Specifications, Thermocouple.

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2018-2019



A Project Report

on

“NONEL INITIATION FOR ECO-FRIENDLY BLASTING”

**Submitted in partial fulfilment of the requirement for the VIII semester
project work – 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

Mining Engineering

By

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Certified that the Project work entitled *“Nonel Initiation for Eco-Friendly Blasting”* is a bonafide work carried out by JANARTHANAN R (USN-1GV15MI018), PREETHIVI R (USN-1GV15MI033), RAJAKUMAR S (USN-1GV15MI039) and RAMADOSS R (USN-1GV15MI042), in the partial fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2018-2019. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of Project Work - 15MNP85 prescribed for the Bachelor of Engineering Degree.

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1. Vijay Raghavan
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ABSTRACT

Blasting is an essential component in mining and one of the most economical methods of rock excavation applicable to both surface and underground mines. The effect of blasting arising from the mining operation is one of the fundamental problems in the mining industry. Rock fragmentation also plays a pivotal role in large scale mining because of its direct effect on cost of drilling, blasting, secondary blasting, crushing and there-by affecting the overall cost of production. The research investigates the effect of initiation device on environment and the production cost. The objectives of the research were achieved through field measurement and data collection. Various informations pertaining to blasting agents and accessories used for blasting operations were also collected. The results revealed that the flyrock, noise and vibration generated during blasting with NONEL are found to be minimal as compared to the safety fuse and the electrical methods. It is also observed that NONEL initiation increases blasting efficiency and also optimize the cost of blasting.

Visvesvaraya Technological University
Belagavi, Karnataka-590 018

2018-2019



A Project Report
on
“OPTIMUM UTILIZATION OF MINING EQUIPMENT BY USING
FLEET MANAGEMENT”

Submitted in partial fulfillment of the requirement for the VIII semester
Project Work– 15MNP85 for the award of the degree of
Bachelor of Engineering
in
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Certified that the Project Work entitled "*Optimum Utilization of Mining Equipment by using Fleet Management*" is a bonafied work carried out by Prakash V (USN-1GV14MI029), Jerin Paul L (USN-1GV15MI019), Ragul S (USN-1GV15MI037) and Thiagarajan M (USN-1GV15MI056) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2018-2019. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of Project Work-15MNP85 prescribed for the Bachelor of Engineering degree.

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- 1) Vijay 14/6
- 2) 2019 14.6.19

ABSTRACT

Truck haulage now a days is the most common means which is used for moving ore/waste in open-cast mining operations. The truck haulage is usually the costliest unit operation in a truck shovel open cast mining. The advancement in computer coding technology has advanced to a point where there are many truck dispatching systems which will give the potential of advancing truck-shovel productivity and future savings. By trying a dispatching system in any mine can give operational increase in production by minimizing waiting times and can other beneficial advantages can also be obtained through good monitoring, optimal routing. From this study the designing of schedule for the mine vehicles and then monitoring those vehicles in real time by using GPS Module is described in brief.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Belagavi - 590018

2018 –2019



A Project Report

on

**“STABILIZATION OF BLACK COTTON SOIL USING RICE HUSK
ASH AND CRUMB RUBBER”**

**Submitted in the partial fulfillment of the requirement for the
VIII Semester Project Work -15CVP85 for the award of degree of**

Bachelor of Engineering

in

Civil Engineering

Submitted by

| | |
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| PRIYANKA P | - 1GV15CV017 |
| KRISHNE GOWDA S | - 1GV15CV010 |
| MURALI B | - 1GV15CV012 |
| SUCHANDRA PRADHAN | - 1GV15CV025 |

Carried out at

Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Under the Guidance of

**Mrs. Silviya L, Assistant Prof,
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Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY

(Formerly Golden Valley Institute of Technology)

Department of Civil Engineering

Kolar Gold Fields – 563120

DR. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

OORGAUM, K.G.F. – 563120

2018-2019

(Affiliated to Visvesvaraya Technological University, Belagavi)

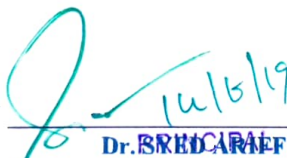


CERTIFICATE

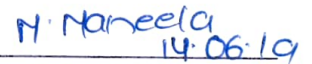
This is to certify that the Project entitled “**STABILIZATION OF BLACK COTTON SOIL USING RICE HUSK ASH AND CRUMB RUBBER**” is a bonafide work carried out by **PRIYANKA P (1GV15CV017)**, **KRISHNE GOWDA S (1GV15CV010)**, **MURALI B (1GV15CV012)** and **SUCHANDRA PRADHAN (1GV15CV025)** in partial fulfillment of the requirements for the award of BACHELOR OF ENGINEERING IN CIVIL ENGINEERING of the Visvesvaraya Technological University, Belagavi during the year 2018-2019. The report has been approved as it satisfies the academic requirements with respect to Project work prescribed by the V.T.U of the above mentioned degree.



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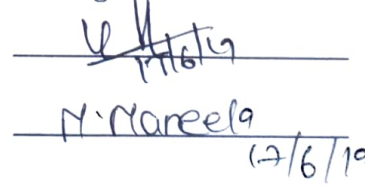
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ABSTRACT

Black Cotton Soil (BCS) is a major soil deposit in India. There is a presence of significant amount of montmorillonite in BCS which is the reason behind the alternate swell shrink property which occurs due to the changes in moisture content. The above property has proven to be troublesome for carrying out civil engineering activities. To encounter this problem stabilization is in practice. The utilization of waste materials such as Rice Husk Ash (RHA), Crumb Rubber (CR) as a soil stabilizer is a part of the innovative research gaining importance nowadays. As the disposal of scrap tyres and agricultural wastes has a potential negative impact on the environment causing pollution and finally affects the ecosystem, thus it is mandatory to make use of these wastes in an environmentally friendly way.

The main objective of the project is to study the geotechnical properties which include the Atterberg limits (LL, PL, PI, FI), Unconfined Compression Strength, Compaction parameters and CBR percent characteristics of Black Cotton Soil by using RHA, CR and its combination in various proportions like 5%, 10%, 15%, 20%, 25%, 30% for all the stabilizing materials used in our project for stabilization of BCS and to suggest the optimum proportion of stabilizer.

KEYWORDS: Black Cotton Soil (BCS), Rice Husk Ash (RHA), Crumb Rubber (CR), Liquid Limit (LL), Plastic Limit(PL), Plasticity Index(PI), Flow Index (FI), Optimum Moisture Content(OMC), Maximum Dry Density(MDD), Unconfined Compression Strength(UCS), California Bearing Ratio(CBR)

Visvesvaraya Technological University

Belagavi, Karnataka-560 018

2018-2019



“FACTORS AFFECTING THE PERFORMANCE OF TUNNEL BORING MACHINE”

**Project Report
(15MNP85)**

Submitted by

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**In Partial Fulfillment of the Requirement for the Award of the Degree of
Bachelor of Engineering in
Mining Engineering**

**Under the Guidance of
Mr. P.Vijaya Raghavan
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CERTIFICATE

Certified that the **Project work** entitled "*Factors Affecting The Performance Of Tunnel Boring Machine*" is a bonafied work carried out by **Rakesh. D (1GV14MI033)**, **H. Lalramhmachhuana (1GV15MI013)**, **J. Lalrinchhana (1GV15MI016)** and **Avinash Nesan. M (1GV16MI401)** and in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project - 15MNP85** prescribed for the Bachelor of Engineering Degree.

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1) Vijay Raghavan

2) Dr. Manasa Mukhopadhyay

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1) Vijay Raghavan 13/6/19

2) Manasa Mukhopadhyay
13/6/19

ABSTRACT

In the view that the knowledge of rock type and technology for tunnel opening is essential for any mechanical excavation; in this project, an attempt is made to study the factors which influence the performance of tunnel boring machine is taken up. There could be a number of technical parameters for a tunneling project which include various geological issues such as rock strength, rock quality, etc. It is found that the performance of the TBM is based on the specifications of the TBM and also on the various rock mass parameters and the accuracy of the Geotechnical Interpretation Report (GIR). In this project, empirical and theoretical studies are made to study the geotechnical investigation of the tunneling area and it is correlated to the performance of Tunnel Boring Machine. From the GIR it is found that the Uniaxial Compressive Strength (UCS) of the rock varies from 12MPa to 54MPa with an average of 22.8MPa. The rock quality found in the area are fair with a average RQD of 53%-55% with very poor quality of 18% in less quantity. Uniaxial compressive strength and Rock Quality Designation, once data obtained it will be precise to decide the TBM selection with reduced risk of geological surprises or if any ground treatment is required. Different grades of rocks are found in the area and it is found that brownish and grey clay, greyish, brownish and greenish tuff, breccia, ash and other pyroclastic material along with highly weathered basalts and inter-trepans are associated with the rocks. Also from the GIR, it is found that Residual soil forms the top strata and below the Basalt Grade III-V is the layer which forms the lower portion, it is followed by a layer of Basalt Grade I-II. The Metro Line is being bored using three types of TBM such as the Cross Over/Dual Mode TBM, Slurry TBM and Earth Pressure Balance TBM. One performance indication is the rate of penetration (ROP) and the advance rate of the TBM, ROP is used to estimate the project duration as it is observed in the initial stage of the project. The actual penetration rate of TBM in Mumbai Metro project is lower than the planned ROP which is 14.58mm/min to that of planned ROP of 17.5mm/. The planned advance rate is 25.2m/day with an actual AR of 21m/day. Mixed soil type (Rock / Soil) is considered as the most affecting factor especially for EPB type TBM reducing penetration rate. Sometimes clayey soil gets stuck in a conveyor belt and in muck chamber causing jamming in operation. Highly altered conditions also produce unique challenges during operation. Tunnel segment lining condition along with the articulation system, the thrust system and the cutterhead mechanism and the selection of specific type of TBM plays a vital role in determining the performance of the TBM.

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2018-2019



A Project Report

on

**“ENVIRONMENTAL MONITORING SYSTEM IN
UNDERGROUND COAL MINES”**

**Submitted in partial fulfillment of the requirement for the VIII semester
project work- 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

Mining Engineering

By

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Certified that the Project work entitled ***"ENVIRONMENTAL MONITORING SYSTEM IN UNDERGROUND COAL MINE"*** is a bonafide work carried out by **Ranjeeth Kumar B (1GV15MI043), Sudhakar Reddy R (1GV15MI054), Tofiq Ahmed (1GV15MI057), Stephen Surya (1GV15MI071)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project Work -15MNP85** prescribed for the Bachelor of Engineering Degree.

Signature of Guide

Mr. PAUL PRASANNA KUMAR

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Name of the Examiner

- 1) Vijay Raghavan
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- 1) Vijay Raghavan 13/6
- 2) Manas Mukhopadhyay 15/6/19

ABSTRACT

Fatal accidents associated with underground coal mines require the implementation of high-level gas monitoring approaches to promote underground safety and health. This study introduces a real-time monitoring, event-reporting and early-warning platform for preventing accidents in underground coal mines. The proposed platform seamlessly integrates monitoring, analyzing, and localization approaches using the Internet of Things (IoT), cloud computing, a real-time operational database, application gateways, and application program interfaces. Sensors for air quality parameters including temperature, humidity, CH₄, CO₂, and CO demonstrated an excellent performance, with regression constants always greater than 0.97 for each parameter when compared to their commercial equivalent. This framework enables real-time monitoring, identification of abnormal events (>90%) in the harsh environment of underground mines. The main contribution of this study is the development of an open source, customizable, and cost-effective platform for effectively promoting underground coal mine safety. This system is helpful for solving the problems of accessibility, serviceability, interoperability, and flexibility associated with safety in coal mines.

Visvesvaraya Technological University
Belagavi, Karnataka-590 018
2018-2019



A Project Report
on

**“BLAST FRAGMENTATION ANALYSIS USING SPLIT-DESKTOP
SOFTWARE FOR OPTIMIZING THE COST OF OVERALL
PRODUCTION”**

**Submitted in partial fulfillment of the requirement for the VIII semester
Project Work – 15MNP85 for the award of the degree of
Bachelor of Engineering
in
Mining Engineering**

By

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Under the Guidance of

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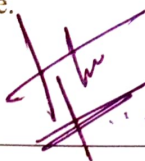
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CERTIFICATE

Certified that the **Project Work** entitled ***"Blast Fragmentation Analysis using Split-Desktop Software for Optimizing the cost of Production"*** is a bonafied work carried out by **Rajamani J (USN-1GV14MI031), Saravanan I (USN-1GV15MI049), Saravanan J (USN-1GV15MI050) and Sujith Sagar T (USN-1GV16MI410)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project Work-15MNP85** prescribed for the Bachelor of Engineering degree.


27/5/19

Signature of Guide

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16/6/19

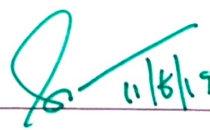
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ABSTRACT

Efficiency of a particular set of equipment like drill, rock breaker, excavator, dumper and crusher in an opencast mine largely depends on the fragment size of the rock and mineral they handle. The smaller the fragments the higher would be the equipment efficiency and lesser would be the wear and tear of the equipment. It is obvious that higher equipment efficiency and reduced wear and tear would result in reduced cost of utilization of equipment. Drilling and blasting being the cheapest amongst the various methods of fragmentation and also suitable to the strongest of the rocks should be designed properly to produce optimum fragment size that can be efficiently handled by equipment used. But smaller the fragments produced by blasting, the higher would be the cost of drilling and blasting though the equipment utilization cost is reduced. Therefore, equipment efficiency and cost of drilling and blasting are not to be looked in isolation. Hence it is a must to fix an optimum fragment size for a set of equipment type and size, such that the equipment operates at a greater efficiency and hence result in reduced overall cost of drilling, primary & secondary blasting, loading, transport and crushing.

Visvesvaraya Technological University
Belagavi, Karnataka-590 018
2018-2019



**A Project Report
on**

"STUDY OF UTILIZATION OF FLY ASH IN CONCRETE"

Submitted in partial fulfillment of the requirement for
the VIII semester project work 15MNP85 for the award of the degree of

Bachelor of Engineering

In

Mining Engineering

Submitted By

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DEPARTMENT OF MINING ENGINEERING

CERTIFICATE

Certified that the **Project work** entitled "*Study of Utilization of Fly Ash in Concrete*" is a bonafied work carried out by **Ajith M (USN-1GV15MI001), Uthaman A (USN-1GV15MI058), Vasantharaja S (USN-1GV15MI059) and Vetrivel V (USN-1GV15MI061)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2018-2019**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project work - 15MNP85** prescribed for the Bachelor of Engineering Degree.


3/6/19

Signature of Guide

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- 2) Dr. Ramesh K


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- 1) Vijay Raghavan
- 2) Dr. Ramesh K

ABSTRACT

Mining industry produces a large quantity of waste every year resulting in severe damage to the environment. The wastes that are produced during mining should be efficiently disposed or effectively reused for any other productive purposes. Coal and lignite mining results in considerable dust pollutions very specifically the coal beneficiation process produces extensive amount of ashes. These ashes can be utilized in construction materials rather than dumping as landfill. When dumped as landfills, these ashes have the tendency to be carried away by the wind resulting in massive damage to the surrounding environment. This study is made to investigate whether this fly ash can be used as an ingredient in concrete preparation as a partial replacement for cement by studying the strength properties of fly ash mixed concrete. The strength properties of concrete when certain percentage of cement in the concrete is replaced with fly ash are studied. The replacement percentage of cement is maintained at 10%, 20%, 30%, 40% and 50% and the samples are tested in the laboratory after the curing period of 21 days. The workability, tensile strength, compressive strength and shear strength of the fly ash mixed concrete sample are determined. Similar tests are conducted on concrete with no fly ash content and both results are compared to find the optimum amount of fly ash that can be replaced without compromising the quality of the concrete. By utilizing fly ash as partial replacement to cement the percentage of CO₂ emitted due to cement manufacturing can also be considerably reduced.