PROFILE-AT-A GLANCE

Dr. V.M.S.R. Murthy

Professor (HAG)
Gold Medalist, National Geoscience Awardee (Mining Technology) MoM-GoI

Present Position: Director, IIEST, Shibpur(on Deputation)
Former Professor (HAG) &
Head, Centre of Rock Excavation Engg.
Department of Mining Engineering, IIT(ISM) Dhanbad

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1. Research Areas:

i. Mine/Tunnel Development and Support Design
ii. Rock Excavation Engineering [Major R&D Project on TBM/Roadheader by CPRI COMPLETED]
iii. Controlled Blasting in Surface Mines, Quarries, Tunnels, Caverns, Ports
iv. Information technology in mining and packages for mining – ITBLADE-Tunnel Blast Design
v. Underwater Rock/Demolition Blasting: Ports, Intake channels
vi. Advanced Instrumentation Techniques for rock excavation engineering system design

2. Area of Specialization:

Drilling, Blasting, Mechanical Cutting in mines and tunnels, Underwater Demolition Blasting, Tunnelling and Underground Space Technology, VR Applications in Mining

3. Research Publications: 235 (International and National Journals and Refereed Conf.)

4. Administrative Positions:

Dean/Associate Dean (Intl. Rel. & Alumni Affairs), Head (Mining Engg.), Head, Centre of Rock Excavation Engg., JRF Exam in-Charge

5. Major Honours/Awards received:

- National Geoscience Award (2019) – Mining Technology
- ISM Gold Medal (PG studies), ISM, Dhanbad
- University 2nd in Engineering (Nagpur University-1986), VNIT, Nagpur
- Halcrow Premium Award (UK)
- ISRMTT Awards for Best Papers
- Hindustan Zinc Limited Prize from Institution of Engineers (India)
- The Institute Prize from Institution of Engineers (India)
- Erasmus Fellow, India 4EUII Exchange, DIATI, Politecnico di Torino, Italy funded by European Commission
- Duo-India Fellowship- DIATI, Politecnico di Torino, Italy (May-June 2022)
- Leadership for Academicians and Building World Class Universities Programme (LEAP-2018)-IITKANPUR and NTU Singapore sponsored by MHRD

6. New Courses and PG Programme

Courses: NATM and TBM Tunnelling, Asteroid and Sea Bed Mining, Underground Space Technology

PG Programme: Tunnelling and Underground Space Technology (since 2009)

7. Projects completed

a. Major Grant-in-Aid; Collaborative:**16** (4 ongoing)
b. Industry Sponsored/Consultancy (PI/Coordinator):**201**

8. Professional Affiliations: 6 National and International Organisations

9. Number of Books: Authored: 1; Edited 2; (b) Chapters in books: 1

10. Number of Patents/Copyrights granted/applied for

a. Patents: **4 (in application stage): Fully indigenous (Made in India Mission): TBM Tests/Surface Miner Tests**

11. Academics

Ph.D. Supervised	18	PG/Graduation	40	Other Major Committees
Under supervision:	7	Under supervision	2	Peer Review Committee of NIRM, MoM, GoI, Section 12 Committee, DGMS, MoLE, Board of Mining Examinations, DGMS, Mine planning Committee, MoC, GoI, National Committee of ISRM(India), Editorial Board of JRMTT, Invited lectures; Ph.D. Thesis Examination, Reviewer for more than 10 Intl. Journals

12. Professional Development Programmes

No. of Programmes: 22 No. of Executives Trained: 440 Organizations: Tata Steel, SAIL, SECL, NCL, HZL, NHPC, DRDO, RVNL

13. Significant Contributions

- Operating efficiency of dragline equipment system vs **environmental and economic efficiency**
- Seismic effects in **dragline bench blasting** and fragmentation/backbreak control
- Thermal behaviour **during pick-rock interaction and optimisation** of operating parameters of surface miner
- Performance analysis of **rotary blasthole drills** through machine vibration and coarseness index mapping
- Reliability modelling of **tunnel boring machines** using Markov chains
- A new rock mass rating methodology (RMRdyn) for **support design in fragile coal mines**.
- **Cuttability assessment** of hard sandstone for **shearer overload prevention** in a mechanized longwall mine (Jhanjhra, ECL).
- Predictive models using **machine learning algorithms (ANN) for throw distance** in bench blasting,
- Estimation of production, pick and diesel consumption in cutting with surface miner and **indigenization of surface miner**.
- Determining **the threshold peak particle velocity** of roof rock for rational explosive charging for improved safety and productivity in both coal and metal mines and tunnels
- Enhancing the functional capability of **indigenous diamond wire technology** for dimension stone cutting in India.
- Asset management through a **comprehensive nomogram for quick assessment of performance of surface miners** and also plan inventories.
- Predicting risk, depth and size of **pot-hole formation**, especially in shallow coal mines for safe mining.
- **Blast-induced pressure and time-based concepts** to estimate the **fly-rock distance**, which is crucial in defining the exclusion zone in a mine for safe operation.
- Model combining rock, explosive and blast design parameters for over break control in metal mines. Aimed at reducing dilution of ore due to blast-induced overbreak. **Pull optimization** was also integrated subsequently.
- Underwater drilling and blasting concepts and techniques for **controlled blasting near marine structures** to complete deepening and widening of the ports (Vishakhapatnam), Intake channels for enhanced trade.
- Developed of **one of its kind testing facilities for Disc/Pick cutting** which was designed, fabricated and tested in IIT(ISM).
- A **virtual reality mine simulator**, only one in India at IIT(ISM) was conceived, designed and developed. Full immersive mining methods (underground and opencast coal mining models) are created under this.

14. Impact of contributions

1. **Research Lab**: A state-of-the-art Rock Excavation Laboratory for advanced research in Drilling, Blasting, Cutting, Rock Dynamics
2. **Publications& Books** (235)
   - IJRM&MSc. TUST, MT-IMM, GGE, NC&A, AJGS, BEG&E, CS, IJMS&T, GE-ICE, CT-TAC, JMMF, JIE(I), MEJ, IMEJ
3. **Technical Reports** [201 No.s] : Key areas namely drilling for surface mines, controlled blasting for protecting structures and overbreak/backbreak, underwater drilling and rock/demolition blasting for

ports, mechanical cutting systems for rock excavation and advanced rock testing facilities have enabled the mining and allied industries achieve higher productivity and safety in general. Professional development programmes in these areas have helped up skilling the industry personnel.

4. **R&D Reports** [16 No.s] : The R&D reports covering dimension stone cutting, FIST Programme for augmenting PG programme in Tunnelling and Underground Space Technology, rock characterization facilities under TEQIP I/II, TBM/Roadheader applications in mines and hydel projects, Virtual Reality Mine Simulator have helped in creating research and modeling facilities which in turn resulted in a good number of Ph.Ds, Masters and UG Projects in the Department. Rotary cutting simulation lab with a TRL 9 project funded by DST is nearing completion for indigenous clean mining technology development using drum cutting with surface miner.
5. Establishment of a **Sandvik Chair Professor** at IIT(ISM) in the area of Rock Excavation, Mining Engg.
6. **Dissemination and Outreach**: Research findings presented in 30th ISEE, New Orleans, USA; 4th EFEE, Vienna, Austria; Fragblast 10 New Delhi, India; Fragblast 11 Sydney, Australia; Fragblast 12 Lulea, Sweden and several Indian technical fora.

7. International Presence Through Collaborative Research (pertinent to India)

- Duo-India Fellowship, Politecnico di Torino, Turin, Italy : TBM and Softground Tunnelling
- Erasmus Mundus Fellow, EC, Politecnico di Torino, Turin, Italy: Dimension stone cutting
- Simtars, JKMRC, University of Queensland, University of New South Wales, University of Wollongong, Australia: Mine productivity and safety through virtual reality simulation.

8. Impact as an Academician/Researcher

- Policy planning: Best mining projects, Research Talks, Modelling and simulation skills, Industry-based research projects, Expert interactions, Excursions and field camps, International mobility for faculty and students
- Professional development programmes (PDP) – 22
- M.Tech.: 40 students placed in L&T, Gammon, Patel, Lombardi, CIL, NMDC, SAIL, Geodata, Apco-Infratech, SCCL, Shell.
- Ph.D.: 18 completed and 7 ongoing; working in CSIR-CIMFR, NIRM, IIT-KGP, VNIT-NGP, L&T
- Awards (students): Dr. A.K.Raina: National Mineral Award 2008-09; Dr. Kaushik Dey: Best paper awards

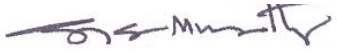
9. R&D Impact

- Social Good: Skill development programmes designed for mining technician for Govt. of Odisha, Signed an MoU with Govt. of Jharkhand and prepared an assessment report for ITI management in Godda, ECL
- Strategic Good: Port deepening and widening, VPT; Overbreak control in tunnels, DRDO, Controlled basting for Aerospace Museum, ITDCem/MES, Clean mining and indigenous technology development project with L&T collaboration(in progress).
- Public Good: Controlled blasting near mines, Deployment of women [Empowerment] in underground mines, Section 12 committee, Metal Mines Regulations 2018, Mines Vocational Training Rules 2019.

10. Industry Support and Solutions Impact

The research and solutions implemented in mining and construction industry have demonstrated higher production, movement of large draft vessels, higher pull, lesser overbreak, ability to assess the cuttability with various machines etc. The science and technology developed is transferred through various PDPs across academic and mining industry. Undergrad and postgrad teaching enriched with use/live cases.

(Appendix A: New Courses, Research Projects, Research Interests-Lab Development, Research Outcomes/Impacts, Research Publications, Research Supervision, Books Published/Edited, Industry-Sponsored-Consultancy Projects, Administrative Experience, Awards)



Signature of Applicant Date: 23.05.2024; Place: Shibpur

(i) New Courses Designed and Coordinated

1) M.Tech. Programme in TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY

The **M. Tech. Programme on Tunnelling and Underground Space Technology** is unique and first of its kind to be offered in this country and has significant role in providing specialized manpower, particularly, in the areas of Tunnelling, Hydel Power construction, Underground Metros, LPG storage and nuclear waste disposal site creation.

This course is aimed at developing specialist underground engineers for planning, designing and creating tunnels and underground space to meet the growing needs of society keeping in view the safety and efficiency. The course has about 10 theory courses and 5 practicals to impart the relevant knowledge and skill sets. Relevant modeling and experimental labs and other infrastructural facilities viz. library, software etc. were established under the guidance of experienced faculty for meeting the course requirements. The course has been updated in 2018 by including latest technological developments in the field of tunneling. The course structure has open and departmental electives to provide a broad perspective to the student.

Students of M. Tech (Tunnelling and Underground Space Technology) find their career growth in sectors like Underground Metros, Tunnelling and Irrigation Departments, Hydroelectric Projects, Urban Development authorities, Construction Companies, Oil Companies for Oil storage in rock caverns, Atomic Energy Corporation for creating Nuclear Waste Disposal sites in underground, Coal and Metal Mining Companies for creating alternative uses of space, Defence for safe hide outs etc.

The course structure that was approved in 2009-10 went through some major changes (in 2012 and 2018) to include relevant engineering inputs as the time demands. The intake of the programme is 18 while about 10 to 12 students join the programme. Most of the students get off campus placement in construction and infrastructure companies, namely, L&T, AFCONS, HCC, State and Central Irrigation Departments. Some go for Doctoral studies and join academics. Students undertake dissertation topics relevant to industry and in collaboration, wherever possible. Mentor faculty provides an opportunity to work on real-life data to make the learning whole some and relevant.

2. M.Tech. Course on NATM and TBM Tunnelling (MNC520)

3. B.Tech. Elective Course Underground Space Technology (MEE18105)

An elective course at B.Tech.(Final year) in the name Underground Space Technology which was introduced to prepare the mining engineers to join construction and infrastructure sectors(2006 onwards).

4. B.Tech. Open Elective Course on Seabed and Asteroid Mining (MNO203)

To explore the new frontiers for sustainable mining of mineral resources a new open elective inter-disciplinary course on Seabed and Asteroid Mining has been initiated from 2021-22 winter semester.

(ii) Research Projects (14)

Sl. No.	Project Title	Amount in ₹ (Lakh)	Role (PI/ Co-PI)	No. of Co-PIs	Funding Agency	Duration	*Status (Completed / Ongoing)
1	Investigations into the planning and design aspects governing the selective coal cutting technology using surface miner for various rock conditions for clean coal production, TMD/CERI/Clean Coal/2017/07(G), DST(CCORD)/241/2019-20/671/ME	336	PI	3	DST, CCORD	4 years 01.09.2019 to 31.08.2024	Ongoing (LAK, RKS,SC) Ongoing
2	Development of Virtual Reality Mine Simulator (VRMS) for improving Safety and Productivity in Indian Coal Mines Project No.: CIL(9)/2017-2018/540/ME	1410 1320/ 90	PI	3	CIL R&D	4.5 years 01.09.2017 to 31.04.2024	Ongoing (DK,RMB, CK,AK)
3	Scientific study to develop a controlled excavation methodology for dismantling concrete berths at OR-I and OR-II Site, Vishakhapatnam Port Trust, ITD CEM/2020-2021/779/ME	31.86	PI	1	ITDCIL	1.5 years 01.03.2021 to 31.08.2022	Completed
4	Evaluation study of the central sector schemes for their continuation beyond 2019-20, Project No.:MoC(3)/2019-2020/693ME	33.3	Co-PI	-	MoC	6 months 01.11.2020 to 01.04.2020	Completed (RMB)
5	Development of a selection methodology for roadheader and tunnel boring machine in different geological conditions for rapid tunneling (2016), CPRI/2016-17/492/ME.	289.2 (117)	PI	1	NPP-CCAR-CPRI	4 years 01.10.2016 to 30.09.2020	Completed (SC,AB)
6	Centre of Excellence in Mining Technology(Indo-Australian Collaboration)	675	PI	4	MHRD	22.01.2016	Granted
7	Erasmus Mundus India4EUII Project Report, Erasmus Mundus Exchange Project No.: IPEM(1)/2013-14/367/INST mme (EMA Action-2,23 mobilities with 194 man-months	211	PI	-	EC	2013-2016	Completed
8	Development of rock characterization facilities for tunnelling and underground space technology PG programme	20	PI	1	TEQIP I/II, MHRD	2012-2015	Completed
9	FIST Program, For augmenting the PG programmes namely tunnelling and underground space technology and Geomatics, 97- 266- ETII-015, ISM Proj NO.: DST(65)/2012-13/310/ME	257	PI	1	DST-FIST	5 years 2013-2017	Completed (DK)
10	Centre of excellence in safety, occupational health and disaster management	7767	PI	4	MHRD	2011-13	Granted
11	Rock characterization and simulation of dimension stone cutting by diamond wire saw with special reference to marble, Indo-Italy Joint Research Proposal funded by DST, GOI, India and MAE, Italy, DET-1(73)/POC(2008-2010)/09, Project No: DST(44)/2009-2010/248/ME	5			DST-IOC	27.10.2009 to 31.07.2012	Completed (BSC)
12	Development of a new rock characterization methodology for optimizing support requirement in tunnels/mines, MHRD(40)/01-02/144/ME	8	PI	-	MHRD-R&D	12.04.2002 to 31.05.2006	Completed
13	Development of predictive models for blast-induced rock damage (BIRD), in tunnels, MHRD(27)/99-00/111/ME	12	PI	-	MHRD-TATE	01.04.1999 to 31.03.2003	Completed
14	Development of a rock classification system for computer aided tunnel blasting design, Ministry of Water Resources, INCRMTT, New Delhi	25	Co-PI	-	INCRMTT	31.03.1998	Completed (AKC)

** Team of faculty were involved in some of the projects*

(iii) Research Interests - Lab Development

Rock Characterization

Studies pertaining to rock/rockmass characterisation for selecting different rock excavation methods and equipment covering drills, shearers, roadheaders, impact hammers, continuous miners, tunnel boring machines, surface miners, ripper-dozers, bucket wheel excavators, diamond wire cutting saw.

Drilling and Blasting

Design of optimum methods of rock excavation by blasting for construction of caverns, tunnels, shafts, rises, open excavations, water plugs and special shapes like niches, surface and underground mines.

Controlled blasting to reduce environmental threats such as fly rock, and ground vibration and also recent developments like air decking. Roof/wall damage control, ore dilution control etc.

Rock-explosive interaction studies

Underwater drilling and blasting

Design of underwater drilling and blasting systems for hard rock dredging in sea ports and water ways coupled with controlled blasting methodologies for protecting marine structures.

Lab development in progress

Mechanized Rock Excavation

Optimisation of roadway drivage rates in Coal Mines deploying roadheaders by systems simulation, modelling.(Awarded Ph.D. from ISM in 1997).

Lab development for Linear Rock Cutting completed and Rotary Rock Cutting in progress

Tunnelling and Underground Space Technology

Planning and design of underground space, Creation of underground Space, Control of overbreak, Pull optimisation, Prediction of rock loads and support requirement for underground openings. Instrumentation for monitoring convergence and rock load for tunnels, caverns and mine roadways using multi-point borehole extensometers, tape extensometers, stress meters and load cells.

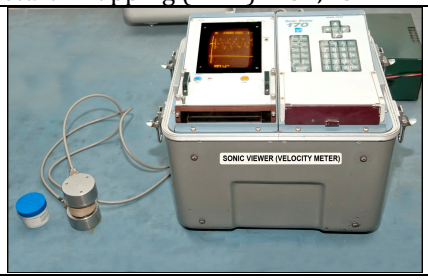
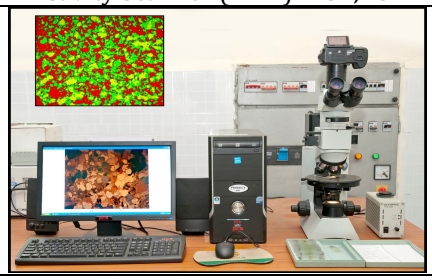
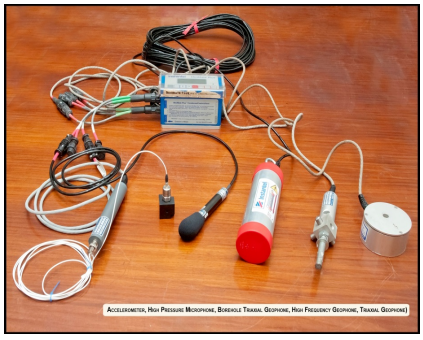
Specific Solutions pertaining to:

1. Explosive selection based on rock characterization, optimum blast design, cost optimization, fly rock control, blast efficiency improvement, ground and air vibration monitoring, controlled/cautious blasting, air deck blasting and fragmentation analysis.
2. Design of optimum methods of rock excavation by blasting for construction of caverns, tunnels, shafts, rises, open excavations, water plugs and special shapes like niches etc. Improving drivage rate in tunnels and mine development roadways using site-specific blast design patterns.
3. Blast-induced rock damage assessment for driving under fragile roof conditions and methods to minimize damage (Controlled blasting techniques).
4. Underwater drilling and blasting for port deepening.
5. Mechanized roadway development system design:
   Machine selection (Roadheader, continuous miner, shearer and tunnel boring machine) based on rock characterization and cuttability studies, reliability analysis and stochastic modelling. Roadheading systems simulation and performance assessment subject to machine and roof failures.
6. Tunnel instrumentation and support design (Analytical, Empirical and Observational methods): Prediction of rock loads and support requirements for underground openings. Instrumentation for monitoring rock loads and convergence using load cells and multi-point borehole and tape extensometers.
7. Dimension stone cutting by diamond wire saw technique
8. Cavity scanning through boreholes
9. Borehole scanning for rock characterization

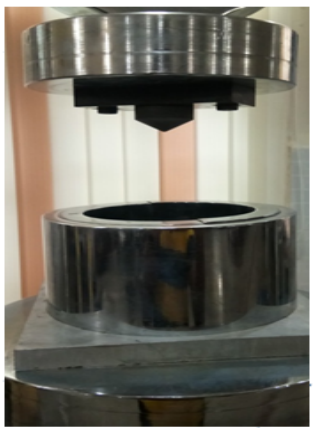
Development of Experimental facilities/laboratories for UG/PG/Research

ROCK EXCVATION LABORATORY

(Funded through: CAS, MHRD, DST-FIST, NPP-CPRI, TEQIP, DST-CCORD)

Rock/Rockmass characterization for dynamic properties		
		
Slim Borehole Scanner for Litho-structural Mapping (DMT)-FIST,DST		Cavity Scanner (MDL)-FIST,DST
		
Geode (Geometrics)-MHRD	Sonic Viewer (Oyo)-CAS	Thin Section Analysis (Petrography)
Blast design and near-field vibration analysis tools		
		
Handy Sies Roof damage tester-MHRD	Burden Finder (Burden design)	Schmidt Rebound Hammer
		
Near-field dynamics laboratory (accelerometer, borehole geophone)-MHRD		VOD Mate Explosive Characterization

Unique in the country established through NPP-CPRI Project)

Mechanical Excavation systems design in rocks (TBM, Roadheader, Surface miner, Shearer, Drills etc.)		
	 	
Linear Cutting Rig	Siever's J/Cerchar Hardness Setup	Universal Brittleness Apparatus
		
Cerchar Abrasivity Apparatus	Rock Tool Wear Index Setup	Tool Grinding Machine
		
Micro Hardness Tester	Fracture Toughness Apparatus	Punch Penetration Setup

(iv) Research Outcomes

Coal Mining :

- Design of Blasting-off-solid in different geo-mining set up with suitable blast patterns for improving production and coal face productivity with SDL/LHD mechanization(Tandsi, Pathakhera, Bhandewada and Saoner Mines, WCL)
- Development of a methodology for support load estimation based on blast-induced damage heights(SCCL and BCCL Mines) –R&D Project funded by MHRD-144
- Anchorage testing of the rock bolts with paper and pvc cement capsules (Inder/Kamptee Colliery, WCL).
- Design methodology for coal gallery blasting and induced blasting of roof in blasting gallery method of coal mining(Guided Ph.D.)
- Pot-hole subsidence prediction and control(Guided Ph.D)
- Drilling Rate Predictions(Ph.D completed)
- Blast design for Dragline Mines(Ph.D. completed)

Drilling & Blasting :

- Development of suitable gadgets for roof vibration monitoring.
- Roof vibration monitoring for determining the reasons for low pull and high vibrations and effect of delay time on pull enhancement.
- Blast-induced damage using vibration measurements and seismic characterization to re-design the maximum charge explodable- R&D Project funded by MHRD-111(Guided Ph.D)
- Fly rock distance prediction in different geomining conditions(Guided Ph.D.)

Mechanized Rock Excavation:

- Design of motor power rating of **shearers** based on rock cutting theories and modification of the power rating from the workability classification of coal.(M.Tech.-self)
- Performance analysis of **road headers** in Indian longwall mines under equipment and roof failure situation using Markov Modelling.(Ph.D.-self)
- Performance assessment of surface miners from intact rock and rockmass properties(Guided Ph.D.)

Metal Mining :

- Investigation on drivage rate optimization in manganese, zinc, chromite and uranium underground mines
- Predictive models for blast-induced damage assessment for uranium and chromite mines for reduced ore dilution(R&D Project)

Tunneling:

- Faster drivage of tunnels and inclines through drilling and blasting (Koyna Hydel Tunnels, Tandsi, WCL)
- Controlled blasting for reduced damage in lake-tap tunnels.(Koyna Hydel Project)
- Rock characterization for roadheader and tunnel boring machine selection(NHPC and NTPC Projects)(Ph.D. in progress)

Caverns:

- Instrumentation and special excavation techniques have been implemented.(Koyna Hydel Project)

Sea Ports:

- Underwater drilling and blasting methodology (upto 20 m depth)-Visakhapatnam Port Trust, Dharti Dredging and Infrastructure Limited, International Seaport Dredging Limited, Vizag Seaport Limited.(Ph.D. in Progress)

Mining Environment:

- Planning strategies for mine closure of surface iron ore mines in fragile locations (Guided Ph.D.)

Specific Contributions

Area: Rock Excavation Engineering and Tunnelling

Concept Development

- Dynamic load assessment in blasting for design of safe and foolproof muffling methods
- Empirical equations to predict roadheader performance in coal mine roadway development based on rock excavatability, roof standability and machine maintainability.
- Computer aided simulation package to model the production systems performance particularly for the development headings in coal employing roadheaders subject to machine and roof failures.
- Overbreak control models based on acceleration and PPV based techniques
- Seismic imaging for blast-induced rock damage assessment
- Fly rock distance prediction in surface mines
- Planning strategies for mine closure in surface iron ore mines
- Fragmentation assessment through blast-induced borehole pressure measurement

Technology Development

- Air-deck blasting technique for production blasting – Dongri-Buzurg Opencast mine, MOIL
- Modified wedge cut for improved pull in underground coal mines – Mine 1, Saoner Project, WCL
- Muffle blasting technique-Upper Kolab Hydel Project, Orissa
- Selective granite block mining – Project Sea-Bird, Indian Navy
- Narrow niche excavation technique – Koyna Hydel Project
- Instrumentation for stability assessment – Koyna and Sri Sailam Hydel Projects
- Rapid and safe drivage technique – Koyna Hydel Project
- Rock mass characterization for Shearer, Roadheader, TBM, Continuous Miner, Surface Miner, Ripper and Drill selection (CIL, L&T, NHPC Ltd., NTPC Ltd.)
- Underwater drilling and blasting methodology(VPT, DDIL, VSPL, ISDL)
- Cuttability Index of Surface Miner(CISM) modified as Rock Cuttability Index
- Blasting gallery system design
- Pot-hole subsidence prediction in coal mines**(Ph.D.)**
- Design and development of Blast Acceleration measurement system for BIRD assessment(MHRD Project, 111)**(Ph.D.)**
- Design and development of seismic imaging technique for blast damage assessment(MHRD Project, 144)
- Fragmentation assessment through blast-induced borehole pressure measurement**(Ph.D.)**

Equipment Development

- Developed a multi-shot exploder and a sequential blasting machine (Tandsi Project)
- Modification, calibration and testing of multi-point bore hole extensometers and load cells to suit the field requirements (Koyna Hydel Project)
- Design of a muffle bucket cum shield for cautious blasting near important structures(Upper Kolab Project)
- Design, fabrication and use of blasting mats (Gujarat Ambuja Cement Project)
- Air deck blasting with bamboo spacers for improved fragmentation (Kaypee Project)
- Design and development of Drilling Rate Index setup (NHPC and NTPC Projects)
- Cerchar Abrasivity Index Apparatus

Rock Excavation Laboratory Experiment Development

- Cerchar Abrasivity Index Apparatus
- Brittleness Index Apparatus
- Siever's J Value Apparatus(modified CHI)
- Drilling Rate Index Apparatus
- Cavity Scanner(FIST Grant)
- Slim Borehole Scanner(FIST Grant)
- Blast Acceleration Measurement Setup(MHRD TATE project)
- Shallow Seismic Imaging Apparatus(MHRD R&D Project)
- Machine Vibration Measuring Apparatus
- Cutting Tool Temperature, Force and displacement Analysis Setup
- Petrological Analysis Setup for Rocks
- Cutting Tool Wear Analysis Setup
- Concrete quality testing with Schmidt Hammer
- Drillability assessment using Coarseness Index
- Fracture Toughness Setup
- Cutting Force, Temperature and vibration measurement setup while drilling of rocks(TEQIPII)
- Cavity Scanning setup through borehole (under FIST): INR 65 lakhs
- Borehole Scanning for rock characterization studies (under FIST): INR 45 lakhs
- Triaxial vibration measurement setup for near-field vibration analysis (under FIST)
- High pressure microphone for near-field air overpressure measurement (under FIST)

(v) Research Publications (235)

2024(6)

1. A Comprehensive Review on Application of Drone, Virtual Reality and Augmented Reality with their application in Dragline Excavation Monitoring in Surface Mines, Singh P, Murthy VMSR, Kumar D, Raval S., Geomatics, Natural Hazards and Risk, 2024.. IF: 4.2, (Q1).
2. Enhancing Dragline Operations Supervision through Computer Vision: Real time Height Measurement of Dragline Spoil Piles Dump using YOLO, Singh P, Murthy VMSR, Kumar D, Raval S., Geomatics, Natural Hazards and Risk. 2024, https://doi.org/10.1080/19475705.2024.2322492, IF: 4.2, (Q1).
3. Design Aspects Governing Disc Cutters and Cutterheads of Hard Rock TBM—A Review. Dash, B., Murthy, V. M. S. R., & Chattopadhyaya, S., Mining, Metallurgy & Exploration, 1-19, 2024, https://doi.org/10.1007/s42461-024-00923-5. (Q2)
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(vi) Research Supervision

Doctoral Level (18+1+6)

S.No.	Name/ Admission No.	Topic	Place (indicate where Research being actually done)	Name of other workers, if any)	Date of Commencement	Percentage progress
As Co-Guide						
1	Kundan Kumar Rai 23DR0257	Mechanized tunneling using tunnel boring machines	IIT(ISM)	Dr. D.Gopi Krishna	22.12.2023	5 (CG)
2	Jannatul Bashar 22DR0296	Modelling and Design of cutting drums for varied rock conditions	IIT(ISM)	Prof. L.A.K.Dhas	01.01.2023	20(CG)
3	Hemant Kumar (21DR0059)	Design and optimization of conical cutting pick for rock cutting applications	IIT(ISM)	Prof. L.A.K.Dhas	13.08.2021	30 (CG)
4	Pradeep Gujjula	Development of blast induced ground vibration prediction model based on rock properties	CSIR-CIMFR, Nagpur	Dr. G.Budi Dr.M.Ramulu	01.05.2017 ext 19.03.2019	50(CG)
5	Srihari Chelluri 19DR0035	Studies on micro and macro parameters of hard abrasive rocks on penetration and wear behaviour in TBM excavated tunnels	IIT(ISM)	Dr. Gopi Krishna Prof.A.S.Venkatesh	30.07.2019	40 (PG)-PT Hold
6	Biswaraj Dash 18DR000677	Investigations into the design of TBM disc cutters for optimum cutting performance in hard rock conditions	IIT(ISM)	Prof. S.Chattopadhyaya	05.02.2018	80(CG)
19	Piyush Singh 17DR000605	Development of Mine Planning Strategies for Dump Disposal in Dragline Bench Mining Through LIDAR Technology and VR Simulations	IIT(ISM)	Prof. Dheeraj Kumar, Prof. Simit Raval, UNSW	24.01.2019/ 27.12.2017/ 22.05.2024	
18	Perwaiz Alam 2015DR1126	Investigations into the influence of rock and machine parameters on coring rate for aiding selection of core drills	MECL Nagpur	Dr. A.K.Raina CSIR-CIMFR, Nagpur	19.06.2015	
17	Lalit Singh Chouhan 2015DR1171	Modelling the rock collision process in different firing patterns in surface blasting and its implication on rock fragmentation	Ultratech, Jaipur	Dr. A.K.Raina CSIR-CIMFR, Nagpur	**29.08.2023** 10.08.2015	
16	Anshul Sindhwani 18DP000365	Planning, design and operational performance aspects of TBM tunnelling in urban environment	L&T Construction	Mr. Md. Raphique	**16.08.2023** 10.10.2017	
15	Suman Kumar Modi 17DR000650	Assessment of the impacts of underwater demolition blasts on marine structures and sea vessels and development of controlled blasting techniques	IIT(ISM)	-	**14.07.2023** 27.12.2017	
14	Anurag Agarwal 17DR000541	Assessment of seismic energy and blast-induced ground vibration attenuation through sedimentary formations during bench blasting and their control using blast design interventions	IIT(ISM) (CG)	Dr.B.S.Choudhary	**09.02.2023** 24.08.2017	
13	B.N.V.Siva Prasad 2016DR1097	Development of micro-macro scale drillability prognosis models and drill selection methodology for mining and tunnelling applications	NIRM, Bengaluru	Dr. Sripad Naik NIRM, Bengaluru	**08.08.2022** 03.11.2015	
12	Chandan Kumar 2014DR0164	Investigations into the design and operating parameters of surface miner for performance optimization	IIT(ISM)	Dr.L.A.K.Dhas	**09.05.2022** 11.07.2014	
11	Anil K. Agrawal 17DR000425	Investigations into terotechnology aspects of tunnel boring machine in mixed rock conditions	IIT(ISM)	Dr.Somnath Chattopadhyaya	**25.01.2022** 01.08.2017	
10	Rakesh Kumar 2015DR0251	Investigations into the rate of penetration and vibration of drill machines in surface mines for performance optimization	IIT(ISM)	Dr. L.A.K.Dhas	**17.08.2021** 16.07.2015	
9	Nachiket V Bhagade 2015DR0160	Predicting backbreak and fragmentation using near-field ground vibrations in dragline bench blasting	IIT(ISM)	Dr. G.Budi ME, IIT(ISM)	**02.07.2021** 16.07.2015	
8	Sheo Shankar Rai 18DP000343	Investigations on improving operational efficiency of dragline mining system with integrated cast blasting, and its impact on environmental and cost efficiency	IIT(ISM)	Prof. A.K.Singh	**02.07.2021** 19.09.2016	
7	Avinash Paul 2011DR0103	Development of a rock mass classification (RMR_{dyn}) for rock load estimation in coal mine development headings of bord and pillar workings	CSIR-CIMFR	Dr. A.K.Singh Dr. A.Prakash	**14.09.2020** 01.11.2019	
6	Autar K.Raina 2009DR0116	Modelling the flyrock in opencast blasting under difficult geomining conditions	CSIR-CIMFR	Dr.A.K.Soni	**01.09.2014** 16.10.2009	
5	Amar Prakash 2009DR0102	A study into the influence of intact rock and rockmass properties on the performance of surface miners in Indian geomining conditions	CSIR-CIMFR	Dr.K.B.Singh	**16.12.2013** 13.07.2009	
4	Ritesh Lokhande 2008DR0105	An investigation into the causes of pot-hole subsidence and its prediction in underground coal mining	NIRM, Bengaluru	Dr.V.Venkateswarlu	**04.01.2013** 18.06.2008	

3	Sundar Singh 0233/06	Development of Planning Strategies for Mine Closure with Special Reference to Ecologically Fragile Iron Ore Mines	IIT(ISM)	Prof. Gurdeep Singh	**07.12.2012** 30.08.2006
2	Kaushik Dey (0223/02)	Investigation of blast induced rock damage and development of predictive models in horizontal drivages	IIT(ISM)	-	**13.08.2008** 20.03.2001
1	C.Sawmliana 0228/2003	An investigation into the blast design parameters for ring hole blasting and induced blasting in blasting gallery method of underground coal mines	CSIR-CIMFR	Dr.P.Pal Roy	**02.03.2007** 18.06.2002

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RESEARCH EXAMINATION (Ph.D.-External)

S.No.	Name/No./DOR	Topic	Date of Exam
1	Satyabrata Behera, M17592-16M191R07	Prediction of rock damage through nearfield ground vibration analysis for surface blasting	07.05.2021
2	Sumant Mohanto, IIT KGP	Assessment of damage in rib and crown pillars in a hard rock mine due to geostatic and blast-induced loads	03.12.2020
3	Ashwani Jain, 2012CEZ8535, IIT Delhi	Analysis of underground structures under squeezing rock conditions	24.12.2019
4	Endalu Tadela Chala, 2013CEZ2790, IIT Delhi	Geomechanical characterization and classification of weathered volcanic rocks for rock engineering practice	02.04.2018
5	Manish Uttarwar VNTI Nagpur	Cast blasting in coal mines	Thesis Evaluated

RESEARCH EXAMINATION (Masters-External)

S.No.	Name/No./DOR	Topic	Date of Exam
1	Soumily Ghosh M17104-17M171P01, IIT KGP	Behavioural study of ground vibration sensors at lower frequency regions	18.11.2019
2	More Ramulu	Investigations into the influence of burden distance on blast induced ground vibrations and air over pressure	August 2004

Postgraduate Level (40) – Completed

Year	S.No.	Name	Topic
2024 CG	42	Victor N Getich, 23IM0009	Mine planning using Minex for clean coal mining using selective mining method
	41	Jangam Vijay Kumar, 23MT0169	Cuttability assessment of coal using drum miner
2023	40	Akash Panwar, 21MT0001	Effect of disc cutter edge profile on specific energy of cutting
	39	Kunal Gupta, 21MT0199	Planning an design of a railway tunnel using NATM and TBM methods
	38	Sanjeev Kushwaha, 21MT0359	Design and analysis of stability of twin tunnels using NATM
2022	37	Sushant Kumar Rai, 20MT0417	Performance analysis of tunnel boring machine in some metamorphic rocks from punch penetration and drilling rate indices (TUST)
	36	Sourav Singh, 20MT0406	Investigations on wear behaviour of disc cutters in hard and abrasive formations for predicting cutter consumption in TBM tunnelling(TUST)
	35	Mansi Priya, 20MT0210	Investigations on structural vibrations during demolition blasting of underwater concrete structures in ports and their control (OCM)
2021	34	Midhat Sajad, 19MT0216	Investigations on boreability prediction of tunnel boring machines based on specific energy and machine parameters (TUST)
	33	Mayur Bhagat, 19MT0108	Investigations on impact of blast induced ground vibrations on structural response and its control in bench blasting (OCM)
2020	32	Rabin K. Samal, 18MT0281	Study of rock, explosive and blast design variable on ground vibration attenuation process in layered media (OCM)
	31	Ashish K.Vishwakarma, 17MT001727	Performance analysis of Raise Boring Machine in Underground Metal Mines(ME)
2019	30	Surjit S., 17MT002146	Investigations on prediction and control of blast-induced overbreak in tunnels(TUST)
2018	29	Sarbartha Sarkar, 2016MT001088	Experimental and numerical analysis of Mode I fracture toughness in sandstone by semi-circular bend specimen test (guided jointly with Dr. Rakesh Kumar) (TUST)
	28	Amritansh Agarwal, 2013JE1022	A case study on evaluation of roadheader performance with empirical and numerical methods(DD-ME)

2017	27	Krishna Sharma, 2015MT000533	A study into the influence of engineering properties of rock on cuttability using Roadheader(TUST)
	26	Gaurav Srivastava 2015MT000607	A study into the influence of engineering properties of rock on boreability using tunnel boring machines(TUST)
	25	Abhijeet Kumar, 2012JE1365	Optimisation of blast parameters for an efficient blast in opencast mining using advanced machine learning techniques(DD-ME)
	24	Pritam K. Sinha, 2012JE1359	Analysis and prediction of rock fragmentation in bench blasting(DD-ME)
2016	23	Amiri Hamis, 2014MT000598	Rockmass characterization for optimization of excavation system design in tunneling(TUST)
2015	22	Debashis Das, 2010JE0520	Blast design for reduction of fines in iron ore mines(DD-ME)
2014	21	Jerrin Sajan Jose, 2012MT0163	A study into the influence of rock, rockmass and machine parameters on tunnel boring machine (tbm) performance in metro tunnelling(TUST)
	20	Anirban Jana, 2009JE0998	Blasting interventions for reduction of fines in iron ore mines(DD-ME)
2013	19	Anand Gautam, 2011MT0229	Development of a Boreability Prediction Model for Tunnel Boring Machines(TUST)
	18	Gurmeet Shekhar	Performance analysis of Tunnel Boring Machines – A case study(DD-ME)
2011	17	Rahul Krishna	Predicting performance of roadheader in tunnel drivage(TUST)
	16	Siddharth Kalo	Boreability estimation of tunnel boring machine from laboratory tests(TUST)
	15	Anoop K. Shukla	Geotechnical investigations for assessing the cutting behavior of diamond wire saw in marble mining(DD-ME)
2009	14	Itishree Chinara	Petrographical aspects influencing roof rock stability of coal bearing rocks- a case study from Singareni coal basin, Andhra Pradesh(MSC-AGL)
	13	Smaranika S.	Petrographical aspects affecting cuttability of coal seams- a case study from Singareni coal basin, A.P.(MSC-AGL)
2008	12	P.K.Meena	Performance analysis of continuous surface miners in different geomining conditions.(OCM)
2006	11	S.Samal	A study into the assessment of rippability and selection of a suitable ripper in limestone.(OCM)
	10	U.K.Deshmukh	Planning of ultimate pit configuration of surface mine using SURPAC-A case study.(OCM)
2005	9	R.Ranjan	Rock characterization for explosive selection in bench blasting(OCM)
	8	D.Ganguly	Production planning using block sequencing for a surface mine- A case study(OCM)
2004	7	H.L.Sahoo	Some studies on performance analysis of bucket wheel excavators(OCM)
	6	R.Suresh	Seismic imaging of coal mine roof for support design(ME)
2002	5	R. R.Chimankar	Application of artificial neural networks in tunnel blast design(ME)
2000	4	Md. Jasim Ahmad	Investigation into some factors influencing the blast performance – A case study(OCM)
1999	3	Rakesh Kumar	Improving blast efficiency through performance analysis – A case study(OCM)
1998	2	Apurna K. Ghosh	Study of factors affecting pull in underground development faces and possible remedies(MPD)
	1	Sharad Kumar	Performance analysis of bulk explosives in different geo-mining conditions(OCM)

Undergraduate Level (109) –Completed

2024 (2)

Abhishek Madhav Sawargave,	20JE0035	Development of a mining method for a thick coal seam having dirt bands using surface miner and its modeling using MINEX software
Ankit Kumar,	20JE0145	

2023 (2)

Anurag Kumar	19JE0170	Underwater blasting effects on marine structures-Some Investigations
Rani Khatik	19JE0686	Improving mine development rate in hard rock mines- A case study

2022 (5)

Nitish Yadav	18JE0562	

Sanyami Nidhi	18JE0736	Underwater rock and demolition blasting – Feasibility of Cyber Physical System
Animesh Saurav	18JE0113	Underground coal mining using continuous miner technology- A mass production strategy
Ritika Suman	18JE0683	Computer vision technology for safe transport in surface mines
Ravi Prakash	18JE0671	Design of bench blasts for ensuring safety of underground workings in close proximity

2021 (2)

Biblab Ghosh	17JE002973	Blast design for excavation of sized blocks for armourstone to construct breakwaters
Nagam Ramsai	17JE003529	Development of controlled underwater blast methodology for dredging of consolidated rockmass

2020 (3)

Aniket Dwivedi	16JE002087	Studies on rock cutting using roadheaders
Sarthak Gupta	16JE002166	Studies on rock cutting using TBM and Cutter Head Design
Rishabh Ranjan	16JE002371	Performance Measurement of mining equipment using overall equipment effectiveness(OEE): A Case Study of Underground Mine

2019 (1)

Mir Sayad Ali	2013BE0021	Effects of blasthole delay on rock fragmentation in dragline bench blasting

2018(10)

Mir Sayad Ali	2013BE0021	Effects of blasthole delay on rock fragmentation in dragline bench blasting
Sayed Zabihullah Pazhwak	2013BE0041	Design of charge configuration for effective fragmentation in bench blasting
Kunal Singh	2014JE0887	Optimisation of fragmentation through blast design of limestone mine
Thadakamalla Shiva	2014JE0479	Optimisation of fragmentation through blast design of limestone mine
Aditya Kumar Panda	2014JE0316	Optimum utilisation of continuous miner for improvement of production of coal from Indian underground coal mines
Arvind Sharma	2014JE0311	Optimum utilisation of continuous miner for improvement of production of coal from Indian underground coal mines
Deepak Kumar	2014JE0522	Behavior of support system in longwall mining
Amritansh Agarwal	2013JE1022	Drifting in underground metal mines: road header
Amritash Singh	2014JE0814	Ringhole drilling in sublevel stoping
Akash Fogla	2014JE0519	Ringhole drilling in sublevel stoping

2017(9)

Divyansh Khare	2013JE0416	Vertical crater retreat method
Ketan Mishra	2013JE0523	Vertical crater retreat method
Bezawada M. Gowd	2013JE0661	An approach to improve the fragmentation of coal during blasting in blasting gallery method
Akhay Kumar	2013JE0664	Progeramme to design grouting system
Pushpendra Sharma	2013JE0667	Evaluation of roadheader performance with empirical and numerical methods: A case study
Kunal Bohra	2013JE0677	Performance analysis of bucket wheel excavator
Amritansh Agarwal	2013JE1022	Drifting in underground metal mines by roadheder
Amit Kumar	2013JE0761	Blasting gallery method

Piyush K. Prasad	2013JE0921	Shaft sinking in water bearing strata

2016 (8)

Nalla Vikas	2012JE0504	Pillar design using numerical modelling
B.Lokeshnath Yadav	2012JE0502	Pillar design using numerical modelling
Sudarshan Yangale	2012JE0979	Impact of blast fragmentation on shovel productivity
Rushikesh B.	2012JE1030	Impact of blast fragmentation on shovel productivity
Bharat Bhushan	2012JE1119	Development of paste backfill technology-An alternative of hydraulic backfill technology
Pradeep Kumar Raj	2012JE0975	Development of paste backfill technology-An alternative of hydraulic backfill technology
Pritam K. Sinha	2012JE1359	Prediction of Throw in Bench Blasting using Machine learning techniques
Abhijit Kumar	2012JE1365	Prediction of Throw in Bench Blasting using Machine learning techniques

2015 (8)

Ankit Bhatia	2011JE0986	Optimisation of Drill Performance in Surface Coal Mines by Drill cuttings analysis
Shubham Kankane	2011JE0503	Cutting performance optimisation of point attack tools
Rahul Deshmukh	2011JE0516	Optimisation of Burden in Bench Blasting
Gautam Drolia	2011JE0511	Cuttability Assessment of Surface Miner
Prashant Sharma	2011JE1116	Strata Control Issues in Underground Coal Mines
Sunny Sourabh	2011JE0501	Drillability Studies with Diamond Bits
Kunwar Brijendra Pratap Singh	2011JE1031	Production Potential Estimation of Continuous Miner in A Typical Indian Underground Coal Mine
Himanshu Joshi	2011JE0995	Explosive selection criteria for horizontal drives in underground mines

2014 (4)

Manish Kumar	2010JE0683	Some studies on rock-explosive impedance and its influence on blast fragmentation
Vipul Agarwal	2010JE1147	A study on the breakage mechanism governing dismantling of concrete walls below water and structural vibration implications
Abhinav Gupta	2010JE0682	Pillar design using analytical, empirical, numerical and modelling
Siddharth Mahanjan	2010JE0687	Effect of underground blasting in coal mines on stability of surface structures

2013 (6)

T.S.Churendra 2008JE0038	Influence of rock mineralogy on cuttability of coal measure rocks
Rahul Talreja 2009JE0530	Rock drillability assessment through coarseness index, mean chip size, specific surface area and fracture toughness
Shlok Srivastava 2009JE0768	Drillability Assessment of Rocks from Brittleness Tests to Aid Drill Selection
Leela Krishna 2009JE0821	Influence of bit parameters on drillability of rocks
Yogesh gautam 2009JE0915	A study on the effect of sonic velocity of intact rocks on drillability of rocks
Varun Gaurav 2009JE0977	Development of a design methodology for surface miner cutting drum design

2012(4)

Hitendra Jain	Development of a computer-aided tunnel blast design methodology under different geomining conditions for rapid and safe mine development
Asheervad Jena	Application of tunnel boring machines(TBM) for hard rock mine development

Gurmeet Singh	Application of surface miner for hard rock cutting in opencast coal mines
Kumar Sankalp	Performance analysis of roadheader in mine development

2011 (3)

Sitanshu Pandey	Influence of grain hardness on drillability of some rocks
Snehdeep Mishra	A study on fracture toughness of some rocks for assessing their cuttability
Ayush Kumar	A study on cutting rate and recovery rate of some dimension stone mines

2010 (5)

Rahul Bhargava	An investigation on designing controlled blasting parameters for protecting gas pipe lines
Neeraj K.Gupta	Study on the effect of blast fragmentation on crusher throughput
Himanshu Pandey	A study on influence of rock and rockmass properties on the selection criteria of roadheader
Anshu Agarwal	Predicting production performance of a continuous miner in underground coal mines
Mukesh Kumar	Study and selection criteria for underwater drilling systems

2009 (4)

Ankur Singh	Study of Rock boreability in hard rock tunneling
Matiul Islam	Improving crusher performance by optimizing blast fragmentation
Ashish K. Dash	Development of a design methodology for underwater drilling & blasting
Ravi Kumar	Effect of some mechanical properties of intact rock on fragmentation.

2008 (4)

Sunil Kesarwani	Comparative study of the geostatistical ore reserve estimation methods with the help of SURPAC software
Manish Kumar	Performance analysis of surface miners
Kumar Ramnikant	Computer aided cutter drum design for surface miner
Ashish Srivastava	Open pit mine design with the help of SURPAC software and over webs

2007 (4)

Nitesh Yadav	Comparing the blasting effects of detonating fuse(DF) and NONEL
Rajat Agarwal	Electronic Detonator: A breakthrough in initiating system
Praveen Sahu	Performance analysis of TBM's
Devender Kumar	Study of problem of ground vibration due to blasting

2006 (1)

Aniruddha Mairal	Study into the factors affecting drilling rate index(DRI) for the assessment of tunnel boreability

2005 (3)

Jagdish Prasad	Design of rock-bolt support system in weak and water charged roofs – A case study
Nikhilesh	An investigation into the rock brittleness index and drilling rate index and their influence on TBM boreability
Bibhuti S.Das	Development of an ANN based tunnel blast design

2004 (4)

Abhineet Sharma	Factors affecting selection of explosive in bench blasting
Amit K.Singh	Roof vibration monitoring in coal mine development headings and some inferences
Himanshu Bajaj	Longwall retreating with shearer – Some design and operational aspects
Anand M.Pandey	Seismic imaging in coal mine roof vis-à-vis support design

2003 (3)

Alok Shukla	An investigation into the factors affecting roof vibration in blasting-off-solid
Dipankar Dwivedi	Evaluation and analysis of some static and dynamic properties of rocks
Punit Arora	Support design in horizontal roadways considering blast-induced rock damage

2002 (5)

Arvind K. Kureel	Improving blasting productivity by air deck blasting
Sanjeev Kumar	Tunnel support design using numerical modelling
Manjeet Malaga	A study of rock index tests for selecting TBM cutters
Gaurav Kamra	Tunnel blast design in different geomining conditions
Vishal K. Ojha	Underground space technology for hydropower generation- Current status and future prospects

2001 (3)

Pankaj Dubey	Effect of Geology on tunnel blast design
Ravi Sinha	Development of Software for tunnel blast design
Rajesh Raitani	Assessment of Rock Damage in tunnel blasting

2000 (7)

K. K. Rao	Assessment of techno-economics of blasting gallery method over other contemporary mining methods
Rajnish Kumar	Computer aided prediction of lognwall gate road development rate using roadheaders
Vivek Mishra	Rock Mass Characterization for roadheader performance analysis vis-à-vis development of an user friendly software package
D. Bhattacharya	Computer aided design of roadheader cutting subsystem in longwall retreating
Manoj K. Mishra	Computer aided development of ventilation system for underground longwall drivage using roadheaders
Leslie Joseph	Costing, evaluation of maintenance parameters and spares inventory for a header operation vis-à-vis a computer software package
Neeraj Srivastava	Computer aided roof support design for underground road header drivage

1999 (3)

K. Devanandam	Economics of bottom hole initiation in bench blasting
Santosh Prasad	Prediction of roof damage with solid blasting in bord and pillar development headings
Bharath M. A.	Performance comparison between front end loaders and shovels

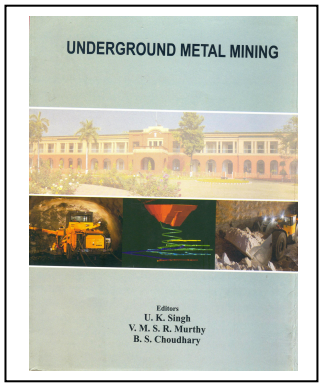
1998 (5)

Sanjeev K. Singh	Blast design in underground coal headings
Rakesh Kumar	Estimation of time required for developing longwall retreating panel
Rana Chakrabarti	Design of performance parameters vis-à-vis selection of a roadheading machine
Debashish Roy	Title to be filled
R. R. Mishra	Blast performance evaluation in level dip and rise galleries in SDL development faces

(vii) Books Published/Edited (3)

(Ed.)U.K.Singh, V.M.S.R.Murthy, B.S.Choudhary, UNDERGROUND METAL MINING: STATUS AND PROSPECTS (UMMSP), Second National Seminar organized in Puri, Odisha, October 13-15, 2011,

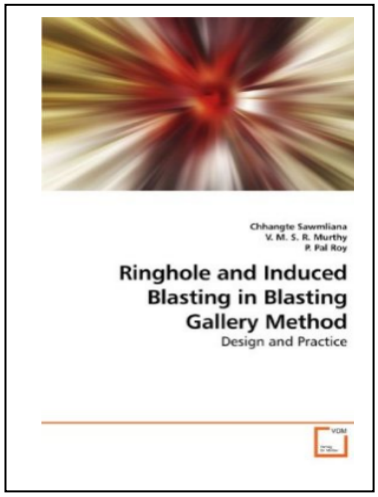
ISBN 978-81-8465-863-7



Chhangte Sawmliana, V.M.S.R.Murthy, P.Pal Roy., 2009, RINGHOLE AND INDUCED BLASTING IN BLASTING GALLERY METHOD – DESIGN AND PRACTICE

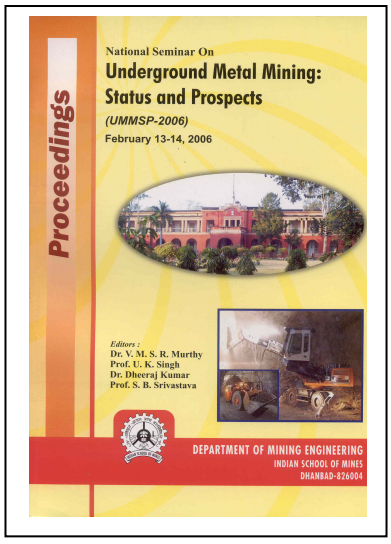
The book describes safe and optimum blasting patterns for ringhole and induced blasting in blasting gallery method of underground coal mines. It has been divided into two parts, viz. ringhole blasting in coal and induced blasting in stone roof. Several mathematical models developed on the basis of extensive field investigations, are described for determining blast design parameters. Model test blasts in concrete blocks of known strengths are also given to ascertain the effect of decoupled charges on fragmentation. A new induced blasting pattern namely 'Staggered Ring Breakage Method' (or 'SRBM' pattern) is prescribed for effective induced caving of overhanging roof.

VDM Verlag(2009/11) - ISBN-13: 978-3-639-21106-1



(Ed.)V.M.S.R.Murthy, U.K.Singh, Dheeraj Kumar and S.B.Srivastava, 2006, UNDERGROUND METAL MINING: STATUS AND PROSPECTS (UMMSP-2006)

This national seminar, thus, is all set to deliberate on the status and prospects of underground metal mining in India to underline the importance of mining as a lucrative business for investors to venture into. To make the Indian metal mining industry globally competitive and economically feasible, issues such as new strategies for exploration, accurate ore body modeling and resource estimation, innovative mine planning, mine development, mining technologies and cost-effective beneficiation strategies needed an urgent focus. Apart from this, the problems associated with deep metal mining such as stress and structure-induced instabilities, ventilation, waste disposal and environmental impacts have been addressed for making these ventures safe and economically viable. 4 keynote addresses and 35 theme papers were included in the proceedings.



(viii) Industry Sponsored- Consultancy Projects (201)

(Updated upto 22.05.2024)

2024(3)

1. V.M.S.R.Murthy and B.S.Choudhary(2024), Development of an underwater rock drilling and controlled blasting methodology for deepening and widening of inner harbour channel near ORI and ORII berths, Port of Visakhapatnam, Cons/7172/2023-24, (Rs.47,20,000/-).
2. B.S.Choudhary and V.M.S.R.Murthy (2024), Scientific study to suggest controlled blast design parameters for intake channel excavation works at Satna-Bansagar, Madhya Pradesh, Sponsored by DDIPL, Project No.: Cons/7118, 2023-24.
3. V.M.S.R.Murthy and Ashok Kumar (2023), NATM and TBM Tunnelling, Tunneling through Soft Media, PDP sponsored by NHPC Ltd., 04.12.2023 to 08.12.2023. (Rs.13, 83,036/-).

2023(3)

1. V.M.S.R.Murthy and Ashok Kumar (2023), NATM and TBM Tunnelling, Tunneling through Soft Media, PDP sponsored by NHPC Ltd., 04.12.2023 to 08.12.2023. (Rs.13,83,036/-).
2. Swapnil Mishra and V.M.S.R.Murthy (2023), Design of tunnels and caverns for hydro power projects, EDP/7106/2023-24, PDP sponsored by NHPC Ltd., 18.09.2023 to 22.09.2023. (Rs. 13,40,736/-)
3. Assessment of cuttability of coal and dirt bands using Cerchar Hardness Index test for the application of surface miner in MCL, Sponsored by MCL, Project No.:CONS/7068/2022-23,(Rs.4,13,000/-).

2022(3)

1. Professional development programme on specialized course on NATM and TBM Tunnelling, Sponsored by NHPC Ltd., November 21-25, 2022, IIIF New Delhi. EDP/7042/2022-23 (Rs.11,18,000/-).
2. V.M.S.R. Murthy and Bharadwaj Pandit (2022), Development of a controlled rock blasting methodology for facilitating the construction of Aerospace Museum at Palam, New Delhi. Sponsored by M/s ITD Cem India Limited, Project No.: Cons/6098/2021-22, (Rs. 31,86,000/-)
3. V.M.S.R. Murthy and A.S.Venkatesh(2021), Evaluation of Specialized Rock/Cutter tool indices for TBM tunneling work of Pakal Dul HEP HRT TBM Package , Kishtwar, J&K, Sponsored by M/s L&T Construction, Project No.: CONS/6084/2021-2022. (Rs. 7,03,280/-).

2021(3)

1. V.M.S.R.Murthy and A.S.Venkatesh(2021), Determination of specialized rock tests for Tunnel Boring Machine application, TEST/6049/2020-2021(Rs. 1,11,000/-)**.**
2. V.M.S.R Murthy and G. Budi (2020), Professional Development Programme on Rock Mechanics in Hard Rock Mining, from 02.12.2019 to 28.12.2019, EDP/6068/2021-2022, Sponsored by HZL, Vedanta, (Rs.28,51,200+GST).
3. V.M.S.R.Murthy et al.(2020), Consolidation of controlled blasting methodology in varied geomining conditions for Dulanga coal mining project(consolidation trial blast period: 26.08.2019 to 30.11.2019 and consolidation monitoring period: 03.12.2019 to 29 .02.2020), project no.: Cons/ 5012/2018-19, October(Phase I & II), Rs.10,62,000/-.

2020(1)

1. V.M.S.R. Murthy (2020), Independent Evaluation and assessment of major central sector schemes of ministry of coal: Research & Development(S&T), Cons/5079/2019-20, Rs. 7,67,000/-.

2019(8)

1. V.M.S.R.Murthy (2019), Monitoring of underwater drilling and controlled blasting methodology for dismantling EQ2, EQ3, EQ4 & EQ5 concrete berths at port of Visakhapatnam - Phase II , 01.05.2019 to 30.09.2019(5 months), Sponsored by M/s ITD CIL, Project No.: Cons/5065/2019-20 (Rs.8,85,000/-)
2. V.M.S.R.Murthy (2019), Monitoring of underwater drilling and controlled blasting methodology for dismantling EQ2, EQ3, EQ4 & EQ5 concrete berths at port of Visakhapatnam - Phase II , 01.11.2018 to 30.04.2019 (six months), Sponsored by M/s ITD CIL, Project No.: Cons/5001/2019-20/, (Rs. 10,62,000/-)
3. V.M.S.R Murthy and B.S.Choudhary (2019),Scientific Study to design blast design parameters for controlling blast-induced ground vibrations, air over pressure and fly rock both in near field and far field at Dulanga Coal Mining Project, Sponsored by Sainik Mining& Allied Services Ltd., CONS/4040/2018-19, (Rs. 5,90,000/-), March.

4. V.M.S.R.Murthy and B.S Choudhary(2019), Scientific study for establishing controlled blasting practice at Bhadokhara Stone Mine, Block No.3 of M/s BSCPL Infrastructure Limited, Nawada, Bihar, Cons/5000/2018-19, June,2019 (Rs. 5,90,000/-).
5. V.M.S.R.Murthy and B.S Choudhary(2019), Scientific study for establishing controlled blasting practice at Bhadokhara Stone Mine, Block No.6 of M/s BSCPL Infrastructure Limited, Nawada, Bihar, Cons/5000/2018-19, June,2019 (Rs. 5,90,000/-).
6. V.M.S.R.Murthy and B.S Choudhary(2019), Scientific study for establishing controlled blasting practice at Nawada (Bhadokhara Stone Mine), Block No.4 of M/s Vibharaj Construction (P) Limited, Nawada, Bihar, Cons/5020/2019-20, July,2019 (Rs. 5,90,000/-).
7. V.M.S.R Murthy, G.Budi and Kashinath Pal (2018), 24 Weeks Intensive Course on Rock Mechanics in Hard Rock Mining –Module II, Cons/4028/2018-19, Sponsored by HZL, Vedanta (Rs.76, 46,400/-).
8. V.M.S.R Murthy and Rakesh Kumar (2018), Development of An Underwater Drilling and Controlled Blasting Methodology for Rock Dredging near WQ8 Jetty at Port of Visakhapatnam, for one-month monitoring, sponsored by M/s ITDCIL, Cons/4033/2019-20, (Rs.1,77,000/-).

2018(10)

1. S.S. Rai, R.K. Sinha and V.M.S.R Murthy (2018), Professional development training program on "Surface Mining Best Practices for Coal Mines" Sponsored by Rajasthan Vidyut Utpadan Nigam Limited (RVUN), Linkup No., Page No., (Rs. 5,66,400/-).
2. V.M.S.R Murthy, G.Budi and Kashinath Pal (2018), 24 Weeks Intensive Course on Rock Mechanics in Hard Rock Mining –Module I, Cons/4028/2018-19, Sponsored by HZL, Vedanta (Rs.76, 46,400/-).
3. B.S.Choudhary and V.M.S.R.Murthy (2018), Scientific study to design a blasting methodology considering the stability of the developed pillars/stooks beneath Borira village during deep hole blasting at Damagoria colliery, CV area, BCCL, Project No.: Cons/3853/18-19, September.
4. V.M.S.R Murthy and Rakesh Kumar (2018), Development of An Underwater Drilling and Controlled Blasting Methodology for Rock Dredging near WQ8 Jetty at Port of Visakhapatnam, sponsored by M/s ITDCIL, Cons/3869/2018-19 (Rs.7,08,000/-).
5. V.M.S.R Murthy, B.S.Choudhary and Rakesh Kumar (2018), Development of an Underwater Drilling And Controlled Demolition Blasting Methodology and Monitoring for Dismantling Concrete Berths (EQ2 To EQ5) at Port of Visakhapatnam,. sponsored by M/s ITDCIL, Cons/3862/2018-19, (Rs.10,62,000/-).
6. V.M.S.R Murthy, B.S.Choudhary and Rakesh Kumar (2018), Scientific study of the existing blasting practices at Vizag tunneling Project to control and reduce blast-induced rock damage (mechanical over-breaks) and suggest possible remedies- A Desktop review, Sponsored by L&T, Cons/4048/2018-19. (Rs.8,26,000/-).
7. V.M.S.R Murthy and B.S.Choudhary (2018), Advanced drilling & blasting techniques for opencast Mines, EDP for SAIL Executives, July 09-11, Organised by IIT(ISM),Dhanbad. sponsored by MTI Ranchi, Cons/EDP/12/2018-19 (Rs.1,41,600/-)
8. V.M.S.R.Murthy(2018), Underwater drilling and controlled blasting methodology for dismantling EQ2, EQ3, EQ4 and EQ5 concrete berths at port of visakhapatnam(Phase I: Trial Blast Report), sponsored by M/s ITDCIL, Cons/3580/2017-18(Rs.17,25,000/-).
9. V.M.S.R Murthy and B.S.Choudhary (2018), Advanced surface mining practices for iron ore mines, EDP for NMDC Executives, May 14-19, Organised by IIT(ISM), Dhanbad. sponsored by M/s NMDC, Cons/EDP/11/2018-19 (Rs.11,89,440/-)
10. V.M.S.R Murthy (2018), A Study in to some intact Rock properties and their Influence on Cuttability of Sandstone band using shearer, Jhanjra Mine, ECL, Sponsored by Gayatri Projects Limited, Cons/3718/2017-18, March, (Rs. 5,66,400/-).

2017(24)

1. V.M.S.R.Murthy (2017), Professional Development Program on Surface and Underground Metal Mining-Some Advanced Aspects for Infosys Executives from 02.11.17 to 05.11.17 Cons/3804/2017-18, November, (Rs.8,92,080/-).
2. V.M.S.R.Murthy (2017), Determination of Cerchar Hardness Index and Cerchar Abrasivity of some rock samples, Sponsered by L&T Construction, Surya Water Supply Scheme Project, Thane, Cons/3666/2017-18, November,(Rs.84,960/-).
3. V.M.S.R. Murthy et al.(2017), Studying entire gamut of activities in taking over of ITI, Sikitia, Godda from JSPL and recommending for managing its total affairs towards its smooth operation maintenance & management under the overall supervision of ECL, Cons/3651/2017-18, October(Rs.9,20,000/-)
4. V.M.S.R.Murthy (2017), Professional Development Program on Drilling & Blasting Techniques for Surface and Underground Excavation for NHPC Excutives from 25.09.17 to 29.09.17, Cons/3720/2017-18, September, (Rs.7,90,780/-).

5. V.M.S.R.Murthy and B.S.Choudhary (2017), Scientific study for controlling the vibrations and improving the dragline productivity in Nigahi and Dudhichua mines, Singrauli, NCL,(Phase III: Investigations on current, modified practices and suggestions), Cons/3417/16-17, September, (cont…).
6. V.M.S.R. Murthy & B.S. Choudhary (2017), Advanced Blasting Techniques in Iron Ore Mines, Sponsored by MTI.Ranchi, M/s SAIL, Cons/3649/2017-18, September (Rs.1,41,600/-).
7. V.M.S.R.Murthy, A.K.Pal and A.K.Verma (2017), Education Abroad- India programme for the Students of University of South Florida-St. Petersburg, USA on " Sustainable Coal Mining Practices, Cons/3622/2017-18, August (Rs. 7,11,458/-).
8. V.M.S.R.Murthy (2017), Scientific study for establishing best blasting practice at GERE Gaya, Block No.2 Stone Quarry of M/s Pushpa Singh, Cons/3607/2017-18, October (Rs. 4,13,000/-).
9. V.M.S.R.Murthy (2017), Scientific study for establishing best blasting practice at GERE Gaya, Block No.1 Stone Quarry of M/s OSPL Ltd., Cons/3606/2017-18,October (Rs. 4,13,000/-).
10. V.M.S.R.Murthy (2017), Development of an underwater drilling and controlled blasting methodology for dismantling existing caissons/ diaphragm walls of EQ-2 to EQ-5 concrete berths at Visakhapatnam port trust, M/s ITD Cementation India limited, Cons/3580/2017-18, July,(Rs. 15,00,000/-).
11. V.M.S.R.Murthy (2016), Scientific study for establishing best blasting practice at GERE Gaya, Block No.5 Stone Quarry of M/s MEPL Ltd., Cons/3551/2017-18, August (Rs. 3,94,896/-).
12. V.M.S.R.Murthy(2017), Monitoring of underwater drilling & controlled blasting methodology at port of Visakhapatnam from 01.07.2015 to 30.09.2015, sponsored by Visakhapatnam port Trust, Cons/3626/2017-18, July(Rs. 5,17,500/-).
13. V.M.S.R.Murthy (2017), Monitoring of ground vibrations(one blast) due to deep hole blasting at GERE stone mine,M/s NECL, Gaya District, Bihar, Cons/3550/2017-18, June,(Rs. 20,000/-).
14. V.M.S.R.Murthy (2017), Monitoring of ground vibrations(one blast) due to deep hole blasting at GERE stone mine,M/s ILFS, Gaya District, Bihar, Cons/3549/2017-18, June,(Rs. 20,000/-).
15. V.M.S.R.Murthy (2017), Determination of Cerchar Abrasivity of some rock samples, Sponsored by FugroGeotech(India) Pvt Ltd, Cons/3539/2017-18, April.(Rs.1,58,700/-)
16. V.M.S.R.Murthy (2017), Determination of Cerchar Abrasivity and Cerchar Hardness of some rock samples, L&T STEC JV Mumbai, Cons/3474/2016-17, April.(Rs.2,82, 900/-).
17. V.M.S.R.Murthy and B.S.Choudhary (2017), Scientific study for controlling the vibrations and improving the dragline productivity in Dudhichua and Nigahi mines, Singrauli, NCL,(Phase II: Interim report on dragline productivity and blasting productivity- Base line analysis), Cons/3417/16-17, March, (cont…).
18. V.M.S.R.Murthy and et al.(2017), Scientific study for designing blast rounds to produce required size of rocks for marine and onshore facilities works and planning for yield analysis at Jafrabad, Gujarat(Phase II- Site visit and quarry excavation planning), DDIL, Cons/Cons/3428/16-17, April (Rs.8,16,500/-).
19. V.M.S.R.Murthy (2016), Scientific study for establishing best blasting practice at GERE Gaya, Block No.3 Stone Quarry of M/s NEC Ltd., Cons/3384/2016-17, March (Rs. 3,94,896/-).
20. V.M.S.R.Murthy and B.S.Choudhary (2017), Scientific study to design controlled blasting patterns for Bagaiya stone mine at Palamau district, Jharkhand, Cons/3432/2016-17, March, (Rs.3,57,075/-).
21. V.M.S.R.Murthy (2017), Determination of Cerchar Abrasivity and Cerchar Hardness of some rock samples, VE Commercial Vehicle Limited, Cons/3444/2016-17, February.(Rs.14,950/-).
22. V.M.S.R.Murthy (2017), Scientific study on blasthole scanning for geological and structural profile mapping in Rampura Agucha mines, Cons/3231/2016-17, January (Rs.59,850/-), IOCL.
23. V.M.S.R.Murthy (2017), Determination of Cerchar Abrasivity Index, Drilling Rate Index and Point Load Strength Index of some rock cores of Parbati hydropower project, Gammon-CMV JV, Cons/3416/2016-17, January (Rs.57,500/-).
24. V.M.S.R.Murthy and B.S.Choudhary (2017), Drilling and Blasting techniques for Surface and Underground Excavations, Sponsored by NHPC Ltd., Cons/3475/2016-17, January 11-13 (Rs. 3,78,000/-).

2016(7)

1. V.M.S.R.Murthy and Dr. Dheeraj Kumar (2016), Professional development programme on Mining Value Chain, Sponsored by Infosys, Cons/3403/16-17, December 05-09 (Rs.6,84,788/-).
2. V.M.S.R.Murthy and et al.(2016), Scientific study for designing blast rounds to produce required size of rocks for marine and onshore facilities works and planning for yield analysis at Jafrabad, Gujarat(Phase I - Site visit and quarry excavation planning), Cons/Cons/3364/16-17, November (Rs.6,21,000/-).
3. V.M.S.R.Murthy and B.S.Choudhary (2016), Scientific study for controlling the vibrations and improving the dragline productivity in Dudhichua and Nigahi mines, Singrauli, NCL,(Phase I: Study Initiation Report covering site selection and preliminary investigations on blasting productivity, Cons/3417/16-17, October, (Rs.40,25,000/-).
4. V.M.S.R.Murthy and G. Budi(2016), Rock Mechanics for Hydro power Projects, Sponsored by NHPC Ltd., Cons/3372/2016-17, September 26-28. (Rs. 3,78,000/-).
5. V.M.S.R.Murthy (2016), Monitoring of ground vibrations due to deep hole blasting at GERE stone mine, Gaya District, Bihar, Cons/327/2016-17, July(Rs. 34,500/-).

6. V.M.S.R.Murthy et al. (2016), Final report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2853/2015-16, April, Sponsored by VPT, Dhanbad(Rs.16,57,831/-).
7. V.M.S.R.Murthy, A.K.Verma (2016), Advances in rock mechanics and numerical modeling for strata control in underground coal mines, Cons/3133/2015-16, Sponsored by SECL, January (Rs.25,76,250/-).

2015 (10)

1. V.M.S.R.Murthy, B.S.Choudhary et al. (2015), Scientific study to design controlled blasting patterns for GERE stone mine, Gaya District, Bihar, Cons/2995/2015-16, November(Rs.3,48,664/-).
2. V.M.S.R.Murthy, B.S.Choudhary (2015), Advances in drilling, blasting and mechanical excavation techniques for improved safety and productivity in coal mines, Cons/3022/2015-16, Spons. by SECL, October.(Rs.20,52,000/-).
3. V.M.S.R.Murthy et al. (2015), Tenth Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/----/2015-16, September, In progress, Sponsored by VPT, Dhanbad, (Rs.5,15,250/-).
4. V.M.S.R.Murthy and G. Budi(2015), Rock Mechanics for Hydro power Projects, Sponsored by NHPC Ltd., Cons/2959/2015-16, July 27-29, 2015(Rs. 4,10,400)
5. V.M.S.R.Murthy, B.S.Choudhary et al. (2015), Ground vibration monitoring during deephole blasting in the 6/15 patch of Kendwadih Colliery, BCCL, Cons/2400/2013, June (Rs.2,27,684/-).
6. V.M.S.R.Murthy et al. (2015), Ninth Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/3178/2016-17, May, In progress, Sponsored by VPT, Dhanbad, (Rs.5,15,250/-).
7. V.M.S.R.Murthy et al. (2015), Final Report on Development of an underwater drilling and controlled blasting methodology for hard rock dredging between container berth and ore berth, Port of Visakhapatnam, Project No.: Cons/2595/2014-15, April, Sponsored by International Seaport Dredging Limited, Chennai.(Rs.5,61,800/-).
8. V.M.S.R.Murthy et al. (2015), Eigth(final) Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2853/2015-16, April, In progress, Sponsored by VPT, Dhanbad, (cont…).
9. V.M.S.R.Murthy, B.S.Choudhary et al.(2015), Conducting scientific study for expansion planning and safety issues of Nongtroi limestone mines, Meghalaya, Cons/2754/2014-15, Sponsored by CIMFR, April (Rs. 2,99,996/-)
10. V.M.S.R.Murthy, B.S.Choudhary et al. (2015), Development of course modules for mining technician under the skill development training program SCTE &VT, govt. of Odisha, Cons/2638/2014-15, Sponsored by SCTE&VT, Govt. of Odisha, February (6,74,160/-).

2014 (18)

1. V.M.S.R.Murthy, B.S.Choudhary et al. (2014), Drilling and Blasting, A 3 day PDP for the executives of NHPC Ltd., December 08-10, Sponsored by NHPC Ltd, Faridabad, Project No.: Cons/ 2668/14-15(Rs.4,04,496/-).
2. V.M.S.R.Murthy, B.S.Choudhary et al. (2014), Scientific Study On Ground And Air Vibration Due To Blasting In An Open Pit Mine of Jindal Chomite Mines, Sukinda Chrome Valley, Cons/2676/2014-15, Sponsored by Jindal Stainless Limited, Odisha, December (Rs.3,37,080/-).
3. V.M.S.R.Murthy et al. (2014), six months PDP on Rock Mechanics for hard rock mining-Phase III (2 months), Project No.: Cons/2668/14-15, September, Sponsored by HZL, Vedanta, Organised by Department of Mining Engineering, ISM, Dhanbad.(Rs.40,44,960/-)
4. V.M.S.R.Murthy et al. (2014), Interim Report on Development of an underwater drilling and controlled blasting methodology for hard rockdredging between container berth and ore berth, Port of Visakhapatnam, Project No.: Cons/2595/2014-15, September, Sponsored by International Seaport Dredging Limited, Chennai.(Rs.5,61,800/-).
5. V.M.S.R.Murthy et al. (2014), Seventh Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2853/2015-16, September, In progress, Sponsored by VPT, Dhanbad, (cont…).
6. V.M.S.R.Murthy et al. (2014), Sixth Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2853/2015-16, August, In progress, Sponsored by VPT, Dhanbad, (cont…).
7. V.M.S.R.Murthy et al. (2014), Study Abroad Programme on Mining, Environment and Sustainable Development, Project No.: Cons/2611/14-15, August, Sponsored by University of South Florida St. Petersburg, USA, Organised jointly by Departments of Mining Engg. and Department of Environmental Science & Engg., ISM, Dhanbad.(Rs.4,04,362/-).
8. V.M.S.R.Murthy et al. (2014), six months PDP on Rock Mechanics for hard rock mining-Phase II(2 months), Project No.: Cons/2517/14-15, July, Sponsored by HZL, Vedanta, Organised by Department of Mining Engineering, ISM, Dhanbad..(Rs.40,44,960/-)
9. V.M.S.R.Murthy et al. (2014), Fifth Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2853/2015-16, July, In progress, Sponsored by VPT, Dhanbad, (cont…).

10. V.M.S.R.Murthy et al. (2014), Fourth Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2045/2013-14, May, In progress, Sponsored by VPT, Dhanbad, (cont…).
11. V.M.S.R.Murthy et al. (2014), Determination of Cerchar Hardness and Abrasivity Index of Some Rock Samples, Project No.: Cons/2591/2014-15, April, Sponsored by CIMFR, Dhanbad.(Rs.44,944)
12. V.M.S.R.Murthy et al. (2014), Determination of Cerchar Abrasivity and uniaxial compressive strength of a limestone sample, Project No.: Cons/2516/2014-15, April, Sponsored by MMD(I) Pvt. Ltd.(Rs.11,236/-).
13. V.M.S.R.Murthy et al. (2014), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/2479/13-14, March, Sponsored by CIMFR, Dhanbad.
14. V.M.S.R.Murthy et al. (2014), six months PDP on Rock Mechanics for hard rock mining-Phase I (2 months), Project No.: Cons/2454/13-14, March, Sponsored by HZL, Vedanta, Organised by Department of Mining Engineering, ISM, Dhanbad (Rs.40,44,960/-).
15. B.S.Choudhary & V.M.S.R.Murthy et al. (2014), Scientific study for blast induced ground vibration near surface feature for development of _C' seam of Somna colliery, Project No.: Cons/2453/13-14, March, Sponsored by SECL,(Rs.3,38,912/-).
16. V.M.S.R.Murthy et al. (2014), Development of an underwater drilling and controlled blasting methodology for dismantling a concrete berth at port of Visakhapatnam, Project No. Cons/2294/2013-14, March, Sponsored by AVCTPL, Visakhaptnam. (Rs.8,98,880/-).
17. V.M.S.R.Murthy et al. (2014), Off campus course on introductory mining to IT executives, Project No.: Cons/2443/2013-14, January, Sponsored by iGATE, Pune.(Rs.3,37,080/-).
18. V.M.S.R.Murthy et al. (2014), Third Interim report on Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2045/2013-14, January, In progress, Sponsored by VPT, Dhanbad, (cont…).

2013 (11)

1. V.M.S.R.Murthy et al. (2013), Monitoring of underwater drilling and controlled blasting methodology at port of Visakhapatnam, Project No.: Cons/2045/2013-14, November, In progress, Sponsored by VPT, Dhanbad, (Rs.22,47,200/-).
2. V.M.S.R.Murthy et al. (2013), Determination of Cerchar hardness and Cerchar Abrasivity indices of some rock samples, Project No.: Cons/2370/2012-13, November, Sponsored by CIMFR, Dhanbad, (Rs.26,966/-).
3. V.M.S.R.Murthy et al. (2013), Determination of Cerchar hardness and Cerchar Abrasivity indices of some rock samples, Project No.: Cons/1794/2012-13, November, Sponsored by CIMFR, Dhanbad, (Rs.7,48,318/-).
4. V.M.S.R.Murthy et al. (2013), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rock samples, Project No.: Cons/2249/13-14, July, Sponsored by CIMFR, Dhanbad, (Rs.2,79,776/-).
5. V.M.S.R.Murthy et al. (2013), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rock samples, Project No.: Cons/2248/13-14, July, Sponsored by CIMFR, Dhanbad, (Rs.4,55,058/-).
6. V.M.S.R.Murthy and B.S.Choudhary (2013), LEO on fines reduction in iron ore mines – some blasting interventions, A three day EDP for the executives of MTI, SAIL, January 18-31, Sponsored by MTI, SAIL, Ranchi, Project No.: Cons/ 2293/13-14(Rs.89,888/-).
7. V.M.S.R.Murthy et al. (2013), Training need analysis in mining domain, Project No.: Cons/2230/13-14, July, Sponsored by INFOSYS, Dhanbad, (Rs.1,12,360/-).
8. V.M.S.R.Murthy et al. (2013), Determination of Cerchar Abrasivity indices of some coal measure rock samples, Project No.: Cons/2136-2137-2138-2139/2013-14, April, Sponsored by CIMFR, Dhanbad, (Rs.4,28,092/-).
9. V.M.S.R.Murthy et al. (2013), Determination of Cerchar Abrasivity indices of some coal measure rock samples, Project No.: Cons/2063/2012-13, February, Sponsored by CIMFR, Dhanbad, (Rs.6,00,002/-).
10. V.M.S.R.Murthy and B.S.Choudhary (2013), Rock Engineering for Tunnelling, A two week EDP for the executives of DRDO, January 18-31, Sponsored by DRDO, GOI, New Delhi, Project No.: Cons/ 2060/12-13(Rs.11,79,780/-).
11. V.M.S.R.Murthy and B.S.Choudhary (2013), Drilling and Blasting Technology, A 4 day EDP for the executives of NHPC Ltd., January 14-17, Sponsored by NHPC Ltd, Faridabad, Project No.: Cons/ 2105/12-13(Rs.4,96,631/-).

2012 (13)

1. V.M.S.R.Murthy et al. (2012), Determination of Cerchar Abrasivity indices of some coal measure rock samples, Project No.: Cons/2003/2012-13, December, Sponsored by CIMFR, Dhanbad, (Rs.1,85,394/-).
2. V.M.S.R.Murthy et al. (2012), Determination of Cerchar Abrasivity indices of some rock samples, Project No.: Cons/1902/2012-13, September, Sponsored by CIMFR, Dhanbad, (Rs.69,663/-).
3. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some rock samples, Project No.: Cons/1901/2012-13, September, Sponsored by CIMFR, Dhanbad, (Rs.80,900/-).
4. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some rock samples, Project No.: Cons/1900/2012-13, September, Sponsored by CIMFR, Dhanbad, (Rs.76,405/-).
5. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some rock samples, Project No.: Cons/1899/2012-13, September, Sponsored by CIMFR, Dhanbad, (Rs.4,68,541/-).

6. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/1795/2012-13, August, Sponsored by CIMFR, Dhanbad, (Rs.5,05,620/-).
7. V.M.S.R.Murthy et al. (2012), Determination of mechanical properties of some rocks identified along the TBM tunnel alignment, Project No.: Cons/1763/2012-13, July, Sponsored by TTAJV-CMRL, Chennai (Rs.4,26,406/-).
8. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/1836/2012-13, June, Sponsored by CIMFR, Dhanbad, (Rs.2,25,844/-).
9. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/1837/2012-13, May, Sponsored by CIMFR, Dhanbad, (Rs.95,506/-).
10. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/1796/2012-13, April, Sponsored by CIMFR, Dhanbad, (Rs.1,48,315/-).
11. V.M.S.R.Murthy et al. (2012), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/1594/2011-12, March, Sponsored by CIMFR, Dhanbad, (Rs.3,28,694/-).
12. V.M.S.R.Murthy et al. (2012), Rock mechanics tests for TBM selection in Chamkharchhu-I HE Project, Zhemgang, Bhutan, Project No.: Cons/1448/2010-11, January, Sponsored by NHPC Ltd.(Rs.7,66,585/-).
13. V.M.S.R.Murthy and B.S.Choudhary (2012), Blasting and Tunnelling Technologies, A 5 day EDP for the executives of NHPC Ltd., January 09-13, Sponsored by NHPC Ltd, Faridabad, Project No.: Cons/1712/11-12(Rs.5,12,895/-).

2011 (6)

1. V.M.S.R.Murthy et al. (2011), Design of an underwater drilling and controlled blasting methodology during trench excavation in Myanmar, Project No.: Cons/1265/2010-11, December, Sponsored by DDIL, Hyderabad. (Rs.3,99,992/-).
2. V.M.S.R.Murthy et al. (2011), Determination of Cerchar hardness and Cerchar Abrasivity indices of some coal measure rocks, Project No.: Cons/1513/2011-12, December, Sponsored by CIMFR, Dhanbad, (Rs.2,84,574/-).
3. V.M.S.R.Murthy and B.S.Choudhary (2011), Applied Drilling Technology, A three day EDP for the executives of NHPC, September 01-03, 2011, Sponsored by NHPC Ltd., Faridabad, Project No.: Cons/1638/2011-12(Rs. 3,97,080/-).
4. V.M.S.R.Murthy et al. (2011), Determination of mechanical properties of rocks from Dibang hydel project, NHPC Ltd., Project No.: Cons/1300/2010-11, August, Sponsored by NHPC Ltd.(Rs.2,49,389/-).
5. V.M.S.R.Murthy et al. (2011), Determination of Cerchar Abrasivity of some rock samples, Project No.: Cons/1543/11-12, September, Sponsored by ICML, Asansol,(Rs.11,030/-).
6. V.M.S.R.Murthy et al.(2011), Determination of Cerchar Hardness Index and Cerchar Abrasivity Indices of some rock samples, Project No.: Cons/0857/09-10, May, Sponsored by CIMFR, Dhanbad.(Rs.10,20,275/-).

2010 (8)

1. V.M.S.R.Murthy et al.(2010), Non-destructive evaluation of concrete structures using Schmidt rebound hammer, Project No.: Cons/1237/2010, November, Sponsored by NECL, (NTPC, Barh) (Rs.22,060/-).
2. V.M.S.R.Murthy et al.(2010), Non-destructive evaluation of concrete structures using Schmidt rebound hammer, Project No.: Cons/1211/10-11, October, Sponsored by DCIPS, (NTPC, Barh).(Rs.1,32,360/-).
3. V.M.S.R.Murthy et al.(2010), A study for fixing controlled blasting parameters during deep hole blasting in East Bassuria Colliery, BCCL, Project No.: Cons/1129/10-11, September, Sponsored by BCCL(Rs.2,31,630/-).
4. V.M.S.R.Murthy et al.(2010), Determination of Cerchar abrasivity and uniaxial compressive strength of a limestone sample, Project No.: Cons/1174/10-11, September, Sponsored by MMD(I) Pvt. Limited, Kolkata.(Rs.11,030/-).
5. V.M.S.R.Murthy et al.(2010), Scientific study on blast induced ground vibration in underground panel 9 of Kenda Seam, Jambad Colliery due to deep hole blasting at Jambad Opencast Project, ECL, Project No.: Cons/0908/09-10, August, Sponsored by ECL.(Rs.2,70,235/-).
6. V.M.S.R.Murthy et al.(2010), Scientific study on blast induced ground vibration, air overpressure and fly rock during deephole blasting in Patch J, Jeenagora Colliery, BCCL, Project No.: Cons/1017/09-10, May, Sponsored by BCCL(Rs.2,20,600/-).
7. V.M.S.R.Murthy et al.(2010), Determination of Cerchar Hardness Index and Cerchar Abrasivity Indices of some rock samples, Project No.: Cons/0999/09-10, April, Sponsored by CIMFR, Dhanbad.(Rs.17,648/-).
8. V.M.S.R.Murthy et al.(2010), Assessment of excavatability of rocks using surface miner in Bhadravati mines, Project No.: Cons/0924/09-10, February, Sponsored by L&T Ltd..(Rs. 1,74,876/-).

2009 (10)

1. V.M.S.R.Murthy et al.(2009), Blast vibration and air overpressure monitoring during underwater blasting for deepening near LPG Jetty, Port of Visakhapatnam, Project No.: Cons/0853/09-10, October, Sponsored by DDIL(Rs.2,25,002/-).
2. V.M.S.R.Murthy et al.(2009), Scientific study for fixing blasting parameters for the OC Patch at Nichitpur Colliery, Sizua Area, Project No.: Cons/0720/08-09, June, Sponsored by BCCL, (Rs.1,95,522/-).
3. V.M.S.R.Murthy et al.(2009), Design of underwater drilling and controlled blasting methodology for deepening of entrance channel and turning circle of port of Visakhapatnam, Project No.: Cons/0772/08-09, June, Sponsored by VPT.(Rs.7,95,163/-).
4. V.M.S.R.Murthy et al.(2009), Scientific study for fixing controlled blasting parameters at Khoodia Colliery, Mugma Area, Project No.: Cons/0775/09-10, June, Sponsored by ECL (Rs.1,47,201/-).
5. V.M.S.R.Murthy and Dheeraj Kumar (2009), Blasting and Tunnelling Technologies, A one week EDP for the executives of NHPC, June 22-26, Sponsored by NHPC, Faridabad, Project No.: Cons/0825/09-10(Rs. 3,80,535/-).
6. V.M.S.R.Murthy et al.(2009), Determination of Cerchar Hardness Index and Cerchar Abrasivity Index of some granitic gneiss rock samples, Proj.No.: Cons/0797/09-10, May, Sponsored by RITES, New Delhi.(Rs.1,76,480/-).
7. V.M.S.R.Murthy et al.(2009), Determination of some physico-mechanical properties of coal, sandstone and fire clay rock samples for surface miner application in Baranj mine, Maharashtra, Project No.: Cons/0758/08-09, March, Sponsored by Roadtec Inc., USA(Rs.67,416/-).
8. V.M.S.R.Murthy et al.(2009), Blast vibration and air overpressure monitoring during underwater drilling and blasting for deepening and widening of stilling basin and intake channel, RIL, Sikka, Jamnagar, Project No.: Cons/0719/08-09, January, Sponsored by DDIL, (Rs.3,99,440/-).
9. V.M.S.R.Murthy et al.(2009), Design of bench blasts for controlling ground vibration, air overpressure and fly rock during deep hole blasting in Gopinathpur Colliery, Mugma Area, Project No.: Cons/0695/08-09, January, Sponsored by ECL.(Rs.1,01,124/-).
10. V.M.S.R.Murthy and Dheeraj Kumar (2009), Blasting and Tunnelling Technologies, A one week EDP for the executives of NHPC, January 27-31, Sponsored by NHPC, Faridabad, Project No.: Cons/0736/08-09(Rs. 5,42,699/-).

2008 (14)

1. V.M.S.R.Murthy et al.(2008), Scientific study for fixing blasting parameters using SME for the Kankanee OCP, Sijua Area, Project No.: Cons/0664/08-09, December, Sponsored by BCCL.(Rs.1,50,335/-).
2. V.M.S.R.Murthy et al.,(2008), Blast vibration and air over pressure monitoring and control during the deepening of inner harbour channel, Port of Visakhapatnam, Project no.: Cons /0321/2007, October, Sponsored by Vizag Seaport Private Limited.(Rs. 5,01,298/-).
3. Dheeraj Kumar, V.M.S.R.Murthy (2008), Scientific study for fixing blasting parameters for the OC Patch at Bhowra(N) Colliery, Project No.: Cons/0633/08-09, October, Sponsored by BCCL (Rs.1,50,335/-).
4. V.M.S.R.Murthy (2008), Determination of Cerchar Hardness Index for some coal measure rocks, Project No.: Cons/0642/08-09, October, Sponsored by CIMFR, Dhanbad.(Rs.97,753/-).
5. V.M.S.R.Murthy and P.K.Behera (2008), Mining Fundamentals, A four day off-campus course for the executives of Infosys, Project No.: Cons/0567/08-09, October, Sponsored by Infosys, Hyderabad.(Rs. 4,35,609/-).
6. V.M.S.R.Murthy and A.S.Venkatesh (2008), Ore Mineralogy and Mining, A three-week course for the executives of Institute of Mining, Mineralogy and Metallurgy, BCSIR, Bangladesh, Project No.: Cons/0634/08-09, September, Sponsored by IMMM, BCSIR, Bangladesh(Rs. 6,89,531/-).
7. PhalguniSen and V.M.S.R.Murthy (2008), Mine Planning and Design, A one week EDP for the executives of Steel Authority of India Limited, Project No.: Cons/0609/2008-09, August, Sponsored by SAIL(Rs. 4,77,530/-).
8. V.M.S.R.Murthy (2008), Determination of Cerchar Hardness and Cerchar Abrasivity Index of Granite, Project No.: Cons/0579/08-09, July, Sponsored by ISPRL, New Delhi(Rs.35,955/-).
9. V.M.S.R.Murthy and Alok Mukhopadhyay (2008), A Joint Off-campus Executive Development Programme on Quarrying and crushing technology for aggregate production in construction sector, 18-19, April, Hotel Taj, Goa, Sponsored by Puzzulona (Rs.39,326/-).
10. V.M.S.R.Murthy et al.,(2008), Design of underwater drilling and blasting methodology for deepening and widening of intake channel and stilling basin, RIL, Sikka, Jamnagar, Project No.: Cons/0426/2007, March, Sponsored by Dharti Dredging and Infrastructure Limited(combined with 27).
11. V.M.S.R.Murthy et al.,(2008), A study into the influence of rock and rockmass properties on the performance of surface miner, Project No.: Cons/0237/2007, February, Sponsored by L&T(combined with 22).
12. V.M.S.R.Murthy et al.,(2008), Assessment of excavatability of rocks using surface miner at Bagalkot mines, Project No.: Cons/0414/2007, January, Sponsored by L&T(Rs.1,60,001/-).
13. V.M.S.R.Murthy et al.,(2008), Determination of rock mechanics properties of calcarenite and fossiliferous limestone for assessing the feasibility of cutting, Project No.: Cons/0407/2007, January, Sponsored by Sethusamudram Corporation Limited(Rs.2,46,911/-).

14. V.M.S.R.Murthy et al.,(2008), Design of underwater drilling and blasting methodology for deepening and widening of intake channel and stilling basin, RIL, Sikka, Jamnagar, Project No. :Cons/0426/2007, January, Sponsored by Dharti Dredging and Infrastructure Limited(Rs.5,99,441/-).

2007 (9)

1. V.M.S.R.Murthy et al.(2007), Shallow seismic refraction survey for the rippability assessment of bauxite deposit distributed over five blocks, Bodai-Daldali bauxite mine, Project No.: Cons/0281/2007, December, Sponsored by BALCO, Vedanta Group, Department of Mining Engineering and Applied Geophysics, ISM , Dhanbad.(Rs.3,37,080/-).
2. V.M.S.R.Murthy et al., (2007), A Study into the influence of rock and rock mass properties on the performance of surface miner(Interim-Report), Project no.: Cons/0237/2007, October, Sponsored by L&T, Phase I.(Rs.4,99,468/-).
3. V.M.S.R.Murthy et al., (2007), A Study into some intact rock properties and their influence on roadheader production performance, Project no.: Cons/0298/2007, August, Sponsored by CMRI(Rs.1,49,439/-).
4. V.M.S.R.Murthy et al.,(2007), Blast vibration and air over pressure monitoring and control during the deepening of inner harbour channel, Port of Visakhapatnam, Project no.: Cons /0236/2007, July, Sponsored by Vizag Seaport Private Limited, Phase II(combined in 22).
5. V.M.S.R.Murthy et al.,(2007), Underwater drilling and blasting methodology for blast vibration and air. over press control during the deepening of inner harbour channel, Port of Visakhapatnam, Project No.: Cons/0236/2007, March, Sponsored by Vizag Seaport Private Limited, Phase I(Rs.2,67,649/-).
6. V.M.S.R.Murthy et al.,(2007), Blast vibration and air over pressure monitoring during underwater blasting for deepening harbour channel of Port of Visakhapatnam, project no.: Cons/0201/2006, March, Sponsored by Vizag Seaport Private Limited(Rs.2,24,480/-).
7. Phalguni Sen, V.M.S.R.Murthy et al. (2007), Surface Coal Mining, EDP for the executives of NTPC Limited, Department of Mining Engineering, ISM, Dhanbad. (Rs.16,51,623/-), Project No.: Cons/0235/2007, (05.03.07 to 06.04.07).
8. V.M.S.R.Murthy et al.,(2007), Determination of Cerchar Hardness Index for Pir-Panjal rocks Project no.: Cons/0171/2006, January, Sponsored by CMRI(Rs.2,22,235/-).
9. V.M.S.R.Murthy et al.,(2007), Design of roof support system in development headings of 2 Seam bottom section KakatiyaKhani 2 incline, Bhoopalapalli area, SCCL, Project no: Cons/0030/3&5/2005, February, Sponsored by SCCL.(Rs.4,40,800/-).

2006 (9)

1. Dheeraj Kumar, V.M.S.R.Murthy et al., (2006), Ground vibration and air over pressure study at Ostapal chromite mines during deep hole blasting and suggestions to control, Project no.: Cons/0124/2006, December, Sponsored by FACOR(Rs.2,13,256/-).
2. V.M.S.R.Murthy et al.,(2006), A study into the mechanical properties of rock for the selection of tunnel boring machine in Loharinag Pala Hydroelectric project, Bhatwari (H.P), Project no.: Cons/0115/2006, December, Sponsored by NTPC(Rs.4,88,244/-)
3. V.M.S.R.Murthy et al.,(2006), A study into the mechanical properties of Manikaran quartzite rock, Parbati hydroelectric project, stage II, (H.P.), Project no.: Cons/0170/2006, November, Sponsored by NHPC(Rs.56,120/-)
4. V.M.S.R.Murthy et al.,(2006), Blast vibration and air over pressure monitoring during underwater blasting for deepening harbour channel of Visakhapatnam port trust, Project no.: Cons/0096/2006, November, Sponsored by Dharti Dredging and Construction Limited, Phase III(combined with 12).
5. V.M.S.R.Murthy et al.,(2006), Determination of Cerchar hardness index of some rocks pertaining to Singbhum copper belt, Project no.: PCE/Test/0004/2006, July, Sponsored by CMRI(Rs. 70,711/-).
6. V.M.S.R.Murthy et al., (2006), A study into the mechanical properties of rock for the selection of tunnel boring machine in Tapovan-Vishnugad hydro power project, Joshimath, Project no.: Cons/0116/2006, June, Sponsored by NTPC(Rs.2,31,420/-)
7. V.M.S.R.Murthy et al.,(2006), Blast vibration and air over pressure monitoring during underwater blasting for deepening harbour channel of Visakhapatnam port trust, Project no.: Cons/0096/2006, May, Sponsored by Dharti Dredging and Construction Limited, Phase II(combined with 12)

8. V.M.S.R.Murthy et al., (2006), Blast vibration and air over pressure study during underwater blasting for deepening harbour channel of Visakhapatnam port trust, Project no.: Cons/0096/2006, April, Sponsored by Dharti Dredging and Construction Limited, Phase I(Rs.4,95,900/-)
9. V.M.S.R.Murthy et al., (2006), A study into the mechanical properties of rock for the selection of tunnel boring machine in Pakaldul hydroelectric project, Kishtwar, J&K, Project no.: Cons/0042/2005, March, Sponsored by NHPC Ltd. (Rs. 4,43,555/-)

2005 (6)

1. V.M.S.R.Murthy and U.K.Singh (2005),Mechanized Tunnelling, A two-week course for the executives of Tapovan Hydroelectric Project, Course No.: Cons/0059/05, September, Sponsored by NTPC, Department of Mining Engineering, ISM , Dhanbad**.(Rs. 3,85,700/-),** (05.09.05 to 17.09.05).
2. V.M.S.R.Murthy et al., (2005), A study into the mechanical properties of volcanic rock for the selection of tunnel boring machine in Kishanganga hydroelectric project, J&K, Project no.: Cons/0053/2005 September, Sponsored by NHPC(Rs.88,711/-)
3. V.M.S.R.Murthy et al., (2005), Seismic study for rippability assessment in Maihar limestone mines, Bhadanpur, Project no.: Cons/0037/5&8/2005, August, Sponsored by Maihar Cements(Rs.26,448/-)
4. V.M.S.R.Murthy et al., (2005), A study into the mechanical properties of rock for the selection of tunnel boring machine in Tapovan-Vishnugad hydro power project, Joshimath, Project no.: Cons/31/6&8/2005, June, Sponsored by NTPC(Rs.3,30,600/-)
5. V.M.S.R.Murthy et al., (2005), A study into the assessment of drilling rate index (DRI) for the selection of tunnel boring machine for Kishanganga project, Project no.: PCE/Cons/1735/2004, May, Sponsored by NHPC.(Rs.1,21,530/-)
6. V.M.S.R.Murthy et al.,(2005), A study on rock mechanics properties for Kishanganga project, Project no.: PCE/419/VMSR/ME/2004, May, Sponsored by NHPC(Rs.79,920/-)

2004 (3)

1. V.M.S.R.Murthy et al., (2004), Design of support system in development headings of I seam, Kakatiya Khani 6 Incline, SCCL, Bhoopalapalli area, Project no.: PCE/Cons/1719/2004, September, Sponsored by SCCL(Rs.2,19,650/-).
2. S.B.Srivastava, U.K.Singh, V.M.S.R.Murthy et al., (2004), Mining for non-mining executives, Course No.: Cons/2952/2004, (21.07.04 to 01.08.04).(Rs.3,04,000/-).
3. PhalguniSen, V.M.S.R.Murthy et al. (2004), Some aspects of surface mining, EDP for the executives of UCIL, Department of Mining Engineering, ISM , Dhanbad.(Rs.), Project No.: Cons/0235/2007, (24.04.04 to 25.04.04).

2003 (1)

1. V.M.S.R.Murthy et al.,(2003), Planning, design and implementation of environmentally benign mine designs, Project no.: PCE/CONS/1597/1999, June, Sponsored by Ministry of Environment and Forests(Rs.8,10,000/-)

2002 (5)

1. V.M.S.R.Murthy et al.,(2002), Determination of RMR of roof of VIII Sean BJ section, Damoda colliery, area-I, BCCL, Sponsored by BCCL, Project no.:PCE/Cons/1673/2002, July(Rs.25,000/-)
2. S.B.Srivastava, V.M.S.R.Murthy et al., (2002), Environmental Management Capacity Building-TAP-Mining Subcomponent, Activity II-B: Task 1, Third Training Programme, Course No. PCE/SC-2928/2002, Rs. 4,29, 000/-, Completed as Key Person.
3. S.B.Srivastava, V.M.S.R.Murthy et al., (2002), Environmental Management Capacity Building-TAP-Mining Subcomponent, ActivityII-B: Task 1, Second Training Programme, Course No. PCE/SC-2904/2002, Rs. 6,60, 000/-, Completed as Key Person (17.06.02 to 26.07.02).
4. S.B.Srivastava, V.M.S.R.Murthy et al., (2002),Environmental Management Capacity Building-TAP-Mining Subcomponent, Activity II-B: Task 1, First Training Programme, Course No. PCE/SC-2900/2002, Rs. 6,27, 000/-, Completed as a key person(07.01.02 to 15.02.02).
5. V.M.S.R.Murthy et al.,(2002), Study of rock properties for selection of tunnel boring machine, Project No.: PCE/Cons/1659/2001, February, Sponsored by NHPC(Rs.1,18,965/-)

2001 (2)

1. Anchorage testing of cement capsules, RML/VMSR-Test/97/7/2001 dated 03.08.2001.

2. Calibration of Proving Ring, RML/VMSR-Test/96/7/2002 dated 30.07.2001(Rs. 11.000/-)

2000 (1)

1. V.M.S.R.Murthy et al.,(2000), Blast vibration, air over pressure and fly rock study during deep-hole blasting at Thakurani iron ore mines and suggestions for their control, Project no.: PCE/Cons/1621, April, Sponsored by Sesa Goa(Rs.59,650/-).

PROJECTS COMPLETED AT CMRI RC, NAGPUR (15)

Consultancy Projects

1997-98

1. Blast pull optimization at Bhandewada Mine, Wani-North Area, WCL Project No: GC/N/1/97, July 1997
2. Fly rock control and productivity improvement study at Kashlog Mine of Gujarat Ambuja Cements Ltd., Project No. GC/N/2/97 Aug, 1997

1996-1997

1. Improving Drivage Rate in development headings of Balaghat and Chikla Mines of Manganese ore (I) Ltd., Project No.: GC/N/1/96, Nov. 1996.
2. Advice on optimum blast pattern for improved productivity in Bagdona Seam of PK-1 and PK-2 mines of Pathakhera Area, WCL, Project No.: GC/N/11/96, January, 1997

1995-96

1. Monitoring of ground deformations and advice on stability status of Coal handling plant and Continued mining activity for Hindustan Lalpeth Opencast Mine, Chandrapur for M/s WCL, Nagpur, January, 1996, Project No.: GC/N/5/95.
2. A study on higher pull on Mine-1 of Saoner Project, WCL, Nagpur Area, (Nov, 1995), Project Report No. MT/COLLAB/N/1/95
3. Instrumentation of caverns of Koyna Hydro-electric Project, Stage-IV, M. S., (Nov.1995), Project No. MT/PF/N/3/92, MT/PF/N/2/93, MT/COLLAB/N/J/3/94

1994-95

1. Niche excavation in machine and transformer hall caverns of Koyna Hydro-electric Project, Stage-IV for M/s HCC Ltd., (Dec. 1994), GC/N/3/93
2. The safe and optimum excavation method for construction of a hydro-electric power house for M/s HEG Ltd., Mandideep, M. P., (June, 1995)

1993-94

1. Instrumentation of permanent access tunnel of underground powerhouse of Srisailam Hydro-electric Project (A. P.), (Mar. 1994), GC/N/3/93
2. Mine plan for project Sea-bird, A project of Indian Navy, (Sept. 1993)

1991-92

1. Feasibility report on widening of tail pool of Upper Kolab Powerhouse, (Jan. 1992)

Sponsored Projects

1. Pull optimization in coal development headings, Saoner Project, WCL
2. Improving blasting efficiency using air-deck blasting, Dongri-Buzurg Mine, MOIL (M.S.)

In-House Projects

1. Parametric study to optimize roadheader performance for coal mine roadway development, CMRI, Dhanbad, Completed

(ix) Administrative Experience

Department Level:

- **Head, Centre of Rock Excavation Engg**., Deptt. of Mining Engg., IIT(ISM)…cont
- **Head, Department of Mining Engineering** (01.11.2016 to 31.10.2019)
- Laboratory-in-Charge: Rock Excavation Laboratory- (04.01.2006 cont…..)
- In-Charge, Departmental Library(01.09.1997 to 01.10.2020)
- Secretary-Departmental Advisory Committee(DAC)-(01.09.1997 to 31.08.2006)
- Mentor-coordinator for M.Tech.(Tunnelling and Underground Space Technology)-(2008 to 2022)
- FIST Programme Coordinator(2011-16)
- Professors Committee, Department of Mining Engineering-13.03.2014
- DSC Member(in different Ph.D. thesis evaluations)
- BOCS-15.09.2014-3 years
- Centre of Excellence in Mine safety, Occupational Health and Disaster Management
- International Collaborations of Department.
- Chairman-NBA Accreditation for Four Year BTech. Programme in Mining Engineering
- Skill Development Project for Mining Domain, Govt. of Odisha
- Convener-Srijan- A techno-management ISM students festival(3 years)
- President: Cultural Scientific and Literary Society of ISM (6 years)
- General Secretary- Scolomin Club-ISM-2004-05

IIT(ISM) Level:

Dean (International Relations and Alumni Affairs)-(from 01.09.2016 to 31.12.2016): 4 months
Associate Dean (International Relations and Alumni Affairs)-(from 17.04.2012 to 31.08.2016): 4 years

International Relations

- **Revision of foreign student rules**
- **Establishment of International EDC for housing PG and Ph.D international students**
- **Creation of facilities for facilitating studies for foreign students in ISM**
- **International Students in campus: 51(2014-15)**
- **Special BE Programme in Mining Engineering for Students from Afghanistan under the Govt. of India initiative for capacity building(in progress)**
- **International Collaborations**

  MOUs with
  - Escola Politecnica da Universidade de Sao Polo, Brazil (17.04.2014)
  - University of Tunis & National High Engineering School of Tunis (ENSIT), (May 2014)
  - National United University, Miaoli, Taiwan (14.06.2014)
  - All Nations University, Ghana (12.08.2014)
  - TU Clausthal, Germany
  - Curtin University, Australia
  - Botho University, Botswana
  - Arkansas State University, USA
  - Institute of Geonics, Ostrava, Czech Republic,
  - University of Osijek, Croatia
  - Politecnico di Torino, Italy

- **International Student/Faculty Exchange Projects:**

- **Erasmus Mundus India 4EUII Local Coordinator, Project No.: IPEM(1)/2013-14/367/INST: Euro 3000**

  Project Coordinator: Prof. V.M.S.R.Murthy
  No. of mobilities: 23(22 completed and one in progress)
  Total man-months: 196
  Total Value (excluding international travel and insurance): 202 lakhs(completed)
  Major Activities: Proposal preparation, Framing of rules governing the mobility, Constitution of incoming and outgoing mobilities, Approvals of DT, Academic Council and Executive Board, Advertising the opportunities, Promotional meetings, Press coverage, Validation of selections as per rules framed, Guiding Learning Agreements, Mobility Certificates, Invitations for mobility, Departmental coordination, Core committees, Counting of credits, result declaration, submission of transcripts, final report to Project coordinator Erasmus Mundus India 4EUII, POLITO, TURIN, ITALY.

  - Organisation of lecture on 24.11.2014 of Dr. Prashanta K. Mahato, Assistant Professor, Mechanical Engg., on his post-doctoral assignment to POLITO in aerospace engg.

- **Erasmus Mundus AREAS+, Facilitator, Project No.: Project No.: IPEM(2)/2014-15/399/INST: Euro 6000(Euro 3000 + Euro 3000(to be paid at the end of student return)**

  Project Coordinator: Dr. Biswajit Chowdhury
  Advisor: Prof. V.M.S.R.Murthy
  No. of mobilities: 16 (India to Europe); 5 (from Europe to India)
  Total man-months:117
  Total Value (excluding international travel and insurance): 120 lakhs
  Activities: Proposal preparation, Framing of rules governing the mobility, Constituion of incoming and outgoing mobilities, Approvals of DT, Academic Council and Executive Board, Advertising the opportunities, Promotional meetings, Press coverage, Validation of selections as per rules framed, Guiding Learning Agreements, Mobility Certificates, Invitations for mobility, Departmental coordination, Core committees, Counting of credits, result declaration, submission of transcripts, final report to Project coordinator Erasmus Mundus AREAS+, POLITO, TURIN, ITALY
  Organisation of Hindi(16.10.2014) and Culture(29.10.2014) classes to foreign students

- **Study Abroad India Programme for University of South Florida St Petersburg, USA(05.08.2014 to 18.08.2014)**
- **Hosting of IR&AA Website (31.12.2014)**

- ***Alumni Affairs***
  - Alumni Data Management(form hosted in IRAA site)
  - Alumni Meet with Prof. Ashok Mishra Committee (ISM to IIT(ISM) conversion)(08.01.2014)
  - SIT Grant(for aiding students to travel abroad to present technical papers)
  - BASANT SAMMAN
  - ISMAA Dhanbad meetings for caution money transfer, no-dues form modification, fund allocation to various student activities
  - Distinguished Alumnus Award Meetings

Committees at ISM Level:

As Chairman:

- IRAA Group Activities
- Group Insurance Policy for ISM Employees

Committees : As Member

- 89th Foundation Day- An Update on ISM Activities- Presentation (09.12.2014)
- Re-practical examination of Numerical Modelling for Dual Degree Mining Students
- Furnishing of International EDC Annexe for foreign students
- Guidelines and Criteria for promotion under CAS-05.04.2012
- Improvement Group – 07.10.2011
- Faculty-in-Charge, JRF Admission-12.10.2010 (2 years)
- President, CSLS- 21.08.2006 (6 years)
- ISM to IIT(ISM) Documents for MHRD
- TEQIP Cell
- Establishment schedule for non-teaching staff
- Fixing of room rents for SAH, EDC and international EDC Annexe
- Customised M.Tech Programme for DRDO-MOU
- Maintenance of roster for reservations
- Afghan Student Issues
- GATE related (Inclusion of Petroleum Engg., Mineral and Environmental Science and Engg.)
- Distribution of PD seats in JEE Advanced

- ***As acting Dean(Academic), Dean(R&D), Associate Dean(A&R), HOD(ME)***
  - Result declaration
  - MOUs with BASF, Sandvik, Chair Professor, Ministry of Labour and Employment,
  - MOLE, DRDO
  - Inspire faculty for Applied Geology(Dr Shubhabrata Paul)
  - Cut-off date for research publications
  - Pay anomaly

Outside ISM

- Member, TIFAC, Natural Resources and Environment Security(last two years)
- Member, Core Group, Mining Engineering Division Board of Institution of Engineers (India)-20.12.2013
- Member, Board of Mining Examinations (Metal), DGMS-30.10.2014, MoLE
- Expert, DRC for Scientist C, MOEF, GOI -18.10.2013
- Expert, Selection Committee, Project Fellow, CIMFR, Dhanbad-04.09.2013
- Appointed Peer-review committee member of NIRM, MoM, GoI.
- Member of National Committee of ISRM (India)

(x) Awards and Academic-Industry Appreciation

National Geoscience Award-2019, Mining Technology, Ministry of Mines, Govt. of India

The Institution of Civil Engineers, London, UK : Halcrow Premium 1997

- A.K. Chakraborty, V.M.S.R.Murthy and J. L. Jethwa (1996), Innovative cautious blasting technique for excavation close to a running hydro-electric power house- a case study, Geotechnical Engineering, Proc. Of Institute of Civil Engineers, UK, January, pp 57-63. (ICE-UK-Awarded on 04.11.1997)

University of South Florida St.Petersburg, USA: Sustainable Mining:India

- Certificate of Appreciation in recognition of contributions to India Education Abroad (August 2014)

Best Paper Awards

- Ajyant Kumar and V.M.S.R. Murthy (2017), Tunnelling with Roadheaders in Varied Geological Conditions for Construction of Hydel Power Projects – Applications, Critical Factors, Performance Prediction and Suggested Testing Methods, INDOROCK-2017: 7th Indian rock Conference, 25-27 October, New Delhi, Organised by ISRMTT.(ISRMTT-Category: Rock excavation, Rock Blasting and Rock Dynamics-2019).
- A.K. Raina, P.B. Choudhury, V. M. S. R Murthy & R. Trivedi, Comparative analysis of P-wave velocity and blastability of rockmass while using throw in surface blasting as an indicator , June 17-18, Indorock 2016, IIT Bombay and ISRMTT, pp 237-245.(ISRMTT-Rock Blasting and Rock Dynamics-2016)
- Dey K. and Murthy V. M. S. R. (2010), New Model for Predicting Blast-Induced Overbreak in Development Drivages of Metal Mines, Journal of Rock Mechanics and Tunneling Technology, Vol 16. No. 2. July 2010, pp.85 – 95.(ISRMTT-Rock Blasting and Rock Dynamics-2010)
- V.M.S.R.Murthy (2000), "Dynamic load assessment in small scale blasting and design of a muffling system, Journal of Rock Mechanics and Tunneling Technology, Vol.6, No.1, May, pp.25-40. (ISRMTT-Rock Blasting and Rock Dynamics-2000)

The Institution Prize (of The Institute of Engineers (India))

- Ritesh D. Lokhande, V. M. S. R. Murthy, K. B. Singh, Chandrani Prasad Verma & A. K. Verma (2018), "Numerical Modeling of Pot-Hole Subsidence Due to Shallow Underground Coal Mining in Structurally Disturbed Ground " Journal of The Institution of Engineers (India): Series D (Springer), Volume 99, No. 1, pp. 93-101, June. (IE(I)-Awarded in December 2019)

The Hindustan Zinc Limited Prize(of The Institute of Engineers (India))

V.M.S.R.Murthy, K.Dey and R.R.Chimankar(2006), Tunnel Blast Design using Artificial Neural Network – A Case Study, Journal of Institution of Engineers(India), Vol. 86, February, pp 39-45 (IE(I)- Awarded in 2006)