CURRICULUM VITAE

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RABINDRA KUMAR SINHA

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Department of Mining Engineering
Indian Institute of Technology (ISM)
Dhanbad, Jharkhand – 826004
India

Personal Details

Father's Name	:	Sheo Dayal Prasad Sinha
Date of Birth	:	15th December 1973
Category	:	General

Present Employment

Designation	Associate Professor Pay Level: 13A2
Organisation	IIT(ISM), Dhanbad
Date of joining	29.09.2014

Areas of Specialisation

- In situ Investigations in Rock Mechanics
- Design of underground structures in rock
- Applied Rock Mechanics and Numerical Modeling

Current Research Interest

- Rock Mechanics – Design and Stability of Pillars/Arrays of Pillars for Different Mining Methods in Coal Mine Workings
- Surface Mining – Planning and design aspects concerning selective coal cutting technology using surface miner for clean coal production

Academic Record

Examination	Subject	Institute	Year	Marks/ OGPA	Class/ Division
PhD	Mining Engineering	Erstwhile ISM	2014	-	-
B.Tech	Mining Engineering	Erstwhile ISM	1997	3.62/5.0	First
10+2	Maths stream	CBSE	1992	70%	First
Matriculation	General subjects	CBSE	1990	77.2%	First

Employment Details

Employer	Position held	Date of Joining	Date of Leaving
IIT(ISM) Dhanbad	Assistant Professor	29.09.2014	continuing
National Institute of Rock Mechanics	Scientist- III	06.03.2003	26.09.2014
The Associated Cement Cos. Ltd	Assistant Manager	04.08.1997	05.03.2003

Summary of Externally Sponsored Projects

Please Refer to Annexure-A for Details

1. **R& D Projects in IIT(ISM)**
   a. Completed : 01 (Final report pending)
   b. Ongoing : 03
2. **FIST Project (PI)** **:** 01
3. **R&D Project in NIRM**
   a. Completed : 01
4. **Consultancy Projects in IIT(ISM)**
   a. Completed : 17
   b. Ongoing : 10
5. **Consultancy Projects in NIRM**
   a. Completed : 61

Summary of Publications

Please Refer to Annexure-B for Details

PUBLICATIONS	Number
Publications in National Journals	14
Publications in International Journals	18
Publications in International Conferences	12
Publications in National Conferences	19
Publication of S&T (R&D) Report	01
Contribution of Chapter in International Books	02
GRAND TOTAL	**66**

Summary of Outreach Programmes

Please Refer to Annexure-C for Details

1. **Delivery of Short Term Courses**
   a. Completed : 06
   b. Ongoing : Nil
2. **Delivery of Invited Lectures in IIT(ISM) / elsewhere**
   a. In IIT(ISM) : 28
   b. Elsewhere : 07
3. **Course Co-ordinator**
   a. Course Co-ordinator (Academic) for BE(ME) : Period 2014-2018
   b. Faculty Advisor : Period 2014-2018

Summary of Ph.D. Supervision

Please Refer to Annexure-D for Details

1. **Number of PhDs Supervised/Awarded**
   a. **Principal Guide** [in IIT(ISM) along with external experts] : 11
   b. **Co-guide** [along with IIT(ISM) Faculty] : 01
2. **Number of PhDs Supervising**
   a. **Principal Guide** [in IIT(ISM) along with external experts] : 10 [Two on the verge of Defense]
   b. **Co-guide** [along with IIT(ISM) Faculty] : 00

Membership of Professional Bodies:

Name of the Body	Status of Membership: Life/Annual
American Rock Mechanics Association	Annual, Aug 2021-Aug 2022
Indian Society for Rock Mechanics and Tunnelling Technology	Life Member, LM 1643
Mining Engineer's Association of India, Dhanbad Chapter	Life Member, LM 5360/DNB
International Society for Rock Mechanics	Free – For year 2013

Academic Delivery

1. **Teaching Including Number and Name of Subjects Taught with LTP**

Acad. Yr.	Offered to	Sem	Subject Code	Name of Subject	LTP
2024-25	6th B.Tech	VI OE	MNO401	Rock Engineering	3-0-0
2024-25	6th B.Tech	VI OE	MNO302	Sea Bed Mining and Asteroid Mining	3-0-0
2024-25	4th B.Tech	IV	MNC209	Rock Mechanics Practical	0-0-2

Acad. Yr.	Offered to	Sem	Subject Code	Name of Subject	LTP
2023-24	1st M.Tech	I (ME+ JRF)	NMNC501	Computational Geomechanics and Ground Control	3-0-0
2023-24	5th B.Tech	V	MNC300	Surface Mining	3-0-0
2023-24	1st M.Tech	I (ME+TUST)	NMNC507	Numerical Modelling Practical	0-0-3
2022-23	4th B.Tech	IV	MNC209	Rock Mechanics Practical	0-0-2
2022-23	3rd B.Tech	III	MNC203	Surveying Practical	0-0-2
2022-23	3rd B.Tech	III	MNC204	Rock Excavation Lab	0-0-2
2021-22	M Tech	8th SEM OE	MNO203	Module I: Sea Bed Mining Module II: Asteroid Mining	1-0-0
2021-22	M Tech	4th B.Tech	MNC205	Rock Mechanics	3-0-0
2021-22	M Tech	6th B.Tech	MNC307	Numerical Modelling and GIS Practical	0-0-2
2021-22	M.Tech	I (ME+JRF)	MNC539	Computational Geomechanics and Ground Control	3-0-0
2021-22	M.Tech	I (ME+TUST)	MNC505	Geomechanics Practical	0-0-2
2021-22	B.Tech	III	MNC203	Surveying Practical	0-0-2
2020-21	B.Tech	V	MEC 15101	Rock Mechanics	3-0-0
2020-21	MNC 511	1MTOCM	MNC511	Surface Mining Operations, Methods and Equipment System	3-0-0
2020-21	B.Tech	IV	MNC 209	Rock Mechanics Lab.	0-0-2
2020-21	AGL and Int. MSc Tech	VI & II	MER16105	ROCK Mechanics (GEOLOGY)	3-0-0
2020-21	B.Tech	VI	MEC 16204	Applied Rock Mechanics & Numerical Modelling Lab	0-0-2
2019-20	B.Tech	V	MEC15102	Surface Mining	3-1-0
2019-20	B.Tech & DD	IX	MEC 19104	Design of structures in rocks	3-1-0
2019-20	AGL and Int. MSc Tech	VI & II	MER16105	Rock Mechanics	3-0-0
2019-20	B.Tech & DD	IV	MEC 14202	Mine Surveying Practical Group-A	0-0-2
2018-19	B.Tech & DD	IX	MEC 19104	Design of structures in rocks	3-1-0
2018-19	B.Tech	V	MEC15102	Surface Mining	3-1-0
2018-19	B.Tech & DD	V	MEC 15201	Rock Mechanics Practical (Section – c)	0-0-2
2018-19	B.Tech & DD	VII	MEC 17801	Project and Seminar	0-0-6
2018-19	B.Tech ME+ME	VI	MEC16104	Applied rock mechanics and numerical modelling	3-1-0
2018-19	B.Tech	VI	MEC16104	Applied rock mechanics and numerical modelling	3-1-0
2018-19	B.Tech ME+ME	VI	MEC 16103	Surface Mine Planning and Design	3-1-0
2018-19	B.Tech	VI	MEC 16103	Surface Mine Planning and Design	3-1-0
2018-19	M.Tech	VI	MEC52103	Planning and Design of Surface Mines	3-1-0
2017-18	B.Tech & DD	IX	MEC 19104	Design of structures in rocks	3-1-0
2017-18	BE(ME) Afghan	VII	MEE17103	Open pit slope analysis and design	3-0-0

Acad. Yr.	Offered to	Sem	Subject Code	Name of Subject	LTP
2017-18	B.Tech & DD	V	MEC 15201	Rock Mechanics Practical (Section – c)	0-0-2
2017-18	B.Tech & DD	III	MEC 13801	Project and Seminar	0-0-2
2017-18	B.Tech & DD	V	MEC 15801	Project and Seminar	0-0-4
2017-18	B.Tech & DD	VII	MEC 17801	Project and Seminar	0-0-6
2017-18	B.Tech & DD	VI	MEC 16104	Applied rock mechanics and numerical modelling	3-1-0
2017-18	BE(ME) Afghan	VIII	MEC 18102	Advanced Underground Mining	3/2-0-0
2017-18	Minor (BT)	VIII	MEM 18102	Mine design exercise	1-3/2-0
2017-18	B.Tech & DD	VI	MEC16204	Applied rock mechanics and numerical modelling (P)	0-0-2
2017-18	B.Tech & DD	IV	MEC 14801	Project and Seminar	0-0-2
2017-18	B.Tech & DD	VI	MEC 16801	Project and Seminar	0-0-4
2017-18	B.Tech & DD	VIII	MEC 18801	Project and Seminar	0-0-6
2016-17	BT+DD	IX	MEC19104	Design of structures in rock	3-1-0
2016-17	B.Tech & DD	V	MEC15201	Applied rock mechanics practical	0-0-2
2016-17	B.Tech & DD	III	MEC13801	Projects and Seminar	0-0-2
2016-17	B.Tech & DD	V	MEC17801	Projects and Seminar	0-0-4
2016-17	BE(ME) Afghan	V	MEC15102	Surface Mining	3-1-0
2016-17	BE(ME) Afghan	V	MEC17801	Projects and Seminar	0-0-4
2016-17	BE(ME) Afghan	VI	MEC16103	Surface Mine Planning and Design	3-1-0
2016-17	B.Tech & DD	VI	MEC16204	Applied rock mechanics and numerical modelling practical	0-0-2
2016-17	B.Tech & DD	IV	MEC14801	Projects and Seminar	0-0-2
2016-17	B.Tech & DD	VI	MEC16801	Projects and Seminar	0-0-4
2016-17	B.Tech & DD	VIII	MEC18801	Projects and Seminar	0-0-6
2016-17	B.Tech	VIII Minor	MEM18102	Mine Design Exercise	0-2-0
2016-17	M.Tech	II	MEE52107	Design of underground structures in rock	3-1-0
2015-16	BT+DD	IX	MEC19104	Design of structures in rock	3-1-0
2015-16	B.Tech & DD	V	MEC15201	Applied rock mechanics practical	0-0-2
2015-16	B.Tech & DD	III	MEC13101	Introduction to Mining (shared with Prof. V M S R Murthy)	2-0-0
2015-16	BE(ME) Afghan	III	MEC13103	Introduction to Mining	2-0-0
2015-16	B.Tech & DD	III	MEC13801	Projects and Seminar	0-0-2
2015-16	BE(ME) Afghan	III	MEC13801	Projects and Seminar	0-0-2
2015-16	BT+DD MLE &MME	IV	MER14102 MER 22132	Mining Methods and Unit Operations	3-0-0
2015-16	B.Tech & DD	VI	MEC16204	Applied rock mechanics and numerical modelling practical	0-0-2
2015-16	B.Tech & DD	IV	MEC14801	Projects and Seminar	0-0-2
2015-16	B.Tech & DD	VI	MEC16801	Projects and Seminar	0-0-4

Acad. Yr.	Offered to	Sem	Subject Code	Name of Subject	LTP
2015-16	B.Tech & DD	VIII	MEC18801	Projects and Seminar	0-0-6
2014-15	M.Tech	II	MEE52107	Design of underground structures in rock	3-1-0
2014-15	B.Tech& DD	VI	MEC16204	Applied rock mechanics and numerical modelling practical	0-0-2
2014-15	B.Tech& DD	VI	MEC16202	Mine Ventilation practical	0-0-2

2. **Development of new experiments and up-gradation of laboratory for UG/PG Practical**
   - Commissioned the hydraulic fracturing test facility for determination of in situ stress
   - Completely revamped the specimen preparation laboratory under Rock Mechanics Laboratory
   - Development and fabrication of experimental setup for determination of gloss index of rock
   - Setting up Acoustic Emission Facility for Rock Mechanics Laboratory
   - Setting up automatic logging facility for triaxial test setup in Rock Mechanics Laboratory
   - Installation of downhole camera for analysis of blast hole
   - Operationalisation of MTS stiff testing machine
   - Instrumental in setting up of water supply facility for experimental setup of flow through porous media
   - Setting up of crane facility for large scale shear box
   - Developed a set of formats for recording experimental laboratory data

Details of Participation in Activities of Department, Institute Level and Outside IIT(ISM)

Sl. No	Name of Activity	Nature of Activity	Role in the activity	Specific contribution
1	Head of the Centre, and Member Secretary GB of CIL Innovation and Incubation Centre (CII) (25.10.21 till current date)	• Promoting the CII Centre in its network, selecting incubates in CII Centre, generating awareness in the community and developing the CII Centre as a forward-thinking economic development tool for the community, Institute and CIL through EB and GB.	• Seeking proposals from incubates	• Review of proposals received by CII • Active participation in the GB of the CII Centre.
2	Member in TAC of PRISM, Ministry of Mines	• Technical evaluation and review of proposals submitted to Ministry of Mines for funding of Innovation Proposal	• Member	• Reviewed project proposals submitted under PRISM 1.0 and PRISM 2.0 for recommendation to Apex Committee
3	Member “Chintan Shivir”, Ministry of Mines	• To propose ideas with respect to Increasing Mineral Production and Operationalization of Mineral Blocks	• Member	• Active participation in the discussions in the series of the Chintan Shivirs

Sl. No	Name of Activity	Nature of Activity	Role in the activity	Specific contribution
3	Member Secretary (Mining), Sub Committee, TexMin Hub Governing Board. & Member (Mining), Executive Committee of TexMin Hub (03.03..21 till current date)	• Assisting the GB in designing and implementation of various schemes in accordance with TIH objectives.	• Seeking proposals for undertaking various components of the activities selected to be included in TIH from time to time.	• Review of proposals received by TIH and recommending them for implementation
4	Member (Alternate) in the 'Rock Mechanics Sectional Committee, CED 48 of BIS" (22.09.2020 till current date)	Standardisation in the Civil Engineering Division Council of BIS in the Formulation of Indian standard in the field of Rock Mechanics covering • field and laboratory tests • rock sampling • classification of rock and rock masses for engineering purposes • load-bearing capacities of rock masses • improvement of rock mass and rock slopes	Providing inputs w.r.t standardisation of various BIS Standards w.r.t • In situ tests such as Hydraulic Fracturing for in situ stress measurement, • in situ shear test for characterisation of rock mass strength criteria	Member working group committee for the revision of the IS 15026 for the preparation of draft
5	Heading as Coordinator in the Area of Energy in Center for Earth Energy and Environmental Research (22.05.2020 till current date)	To facilitate R&D activities in the area of Energy	Coordinator	Submitted an R&D Project proposal to Ministry of Mines under the Satyabhama Scheme related to Uranium Mining in conserving the mineral resources
6	Departmental Placement Coordinator (27.08.2018 till current date)	Administrative	Co-ordination	Co-ordination between students and CDC
7	Member Secretary DUGC (03.09.2018 – current date)	Affairs of UG Programme at Departmental Level	Co-ordination	Pivotal role in re-vamping the entire syllabus of UG Curriculum
8	Basant 2019, GJ Coordinator	Coordinator, Basant for-Golden Jubilee 1969 Passout Batch	Coordinator	To take care of all the logistics of the 1969 Batch visiting Basant-19
9	Member Artificial Intelligence R&D Committee (05.11.2018 till current date)	Smooth processing of all matters related to Artificial Intelligence Lab so as to create a vibrant environment for AI applications in all related fields of Science and Engineering with a special focus on Earth and Energy Sciences	Member	Attended Courses on AI-ML, Participated in drawing the specs of HPU and Cloud Computing Facilities of IIT(ISM)
10	Departmental Coordinator NBA Accreditation Process (06.07.16 – 05.08.2020)	External Auditing of NBA for accreditation	Coordinator NBA	Coordinating the entire audit process in the Department of Mining Engineering
11	Discharging the duties of Assistant Laboratory In charge – Rock Mechanics Laboratory	Co-ordination for smooth functioning of the laboratory	In charge – Rock Mechanics Laboratory	MTS stiff testing machine will be operational in June 2018.
12	Faculty Advisor – 2nd year B.Tech & DD (2016-2018)	Co-ordination with students, Exam and Academic section	Faculty Advisor for 2nd Year Students	Conducting departmental registration of students and co-ordination with MIS/Exam and Academic Departments
13	Coordinator Academic Activities of BE(ME) students of Afghanistan nationality (2014-2018)	Coordinator the academic activities	Faculty advisor and Coordinator of Academic activities	Coordinating activities such as planning of time table, allocation of Faculty Members in consultation with respective Heads, Co-ordinating exam activities in consultation with JR(E&A), Registration of candidates, excursions, purchase of books in consultation with respective faculty members, organising summer vacational training etc.
14	Selection of Project Assistants in CSIR-CIMFR on 24.07.2015	Interviewing candidates suitable for the post	Member of the Selection Board	Contributed in the capacity of member

Sl. No	Name of Activity	Nature of Activity	Role in the activity	Specific contribution
15	Faculty Advisor for 3rd Year B.Tech and BT+DD Miing Engineering students	Verifying the results and approving the semester registration of students on behalf of HoD/ME	Executing the delegated powers of HoD/ME	Maintaining Records of current students with respect to semester registration
16	Member Moderation board	Moderation of end semester question papers	Member	Active participation
17	Member – Tabulation of marks for preparation of results	Verification of marks awarded by faculty members through MIS and comparison of tabulation printout of MIS	Tabulator	Pointed anomalies for correction in tabulation sheets
19	Member Selection Board for recruitment of MT- in CIL. Campusing on 29.02.2016 at IIEST Shibpur	Selection of candidates and interviewing	Member of the Selection Board	Contributed in the capacity of member
20	Preparation of Vision Document for ISM	Preparation of documents and presentation	Member Secretary	Contributed in the capacity
21	Selection of Project Assistants in CSIR-CIMFR on 03.06.2016	Interviewing candidates suitable for the post	Member of the Selection Board	Contributed in the capacity of member
22	Selection of Project Asstt in CSIR-CIMFR on 20.10.2016	Interviewing candidates suitable for the post	Member of the Selection Board	Contributed in the capacity of member
23	JEE Counselling for 2016 entrants in IIT(ISM)	Scrutiny of documents	Nominated faculty	Scrutinised documents and recommended for admission in IIT(ISM)
24	Selection of Project Assistants in CSIR-CIMFR on 15.05.2018	Interviewing candidates suitable for the post	Member of the Selection Board	Contributed in the capacity of member
25	Selection of Project Assistants in CSIR-CIMFR on 15.07.2018	Interviewing candidates suitable for the post	Member of the Selection Board	Contributed in the capacity of member

Nature of Work and Duties in National Institute of Rock Mechanics (2003-2014)

- Extensively involved in the execution of different projects related to the determination of *in situ* rock mass properties and *in situ* stress for the design of mining methods, underground powerhouse caverns, crude storage scheme etc. ***(Please Refer to Annexure – A)***
- Developed a classification System for bord and pillar layout vis-à-vis its amenability to re-orientation based on in situ stress and rock competence.
- Developed a set of equations for estimation of support requirement for depillaring panels of bord and pillar mines based on in situ stress, depth of working, rock competence and geometric configurations of the working panel.
- Developed a system of lowering hydraulic fracturing tool to depths beyond 300 m using the drilling rig.
- Developed a system for cutting slot in highly fractured rock to be used to determine *in situ* stress using flat jacks.
- Development of a borehole camera system to determine the orientation of fracture using impression packer of hydraulic fracturing system and borehole compass. The development is under progress.
- Developed an extensive clientele relationship through various consulting projects

Nature of Work and Duties in The Associated Cement Companies Limited (1997-2003)

- Instrumental in collecting and analysing data, including production, maintenance, and efficiency parameters of the mining activities.
- Successfully developed and implemented a format for evaluating efficiency parameters at the mine.
- Involved in preparing monthly and annual reports of the quarry and reporting to the head office.
- Statutory reports pertaining to DGMS, IBM, Department of Mines and Geology, Controller of Explosives and LEO.
- Entrusted with the responsibility of being the coordinator of ISO-9002 and ISO 14001 for mining activities related to Madukkarai Cement Works.
- Involved in renewal of mining lease of Walayar Limestone mine of ACC falling completely in Reserve Forest Area. This included preparation of forest proposal, EIA & EMP, and preparation of mine plan for MoEF Clearance. This also required liasioning with different governmental agencies and officials at different levels.
- Played a key role in setting Service Level Agreement (SLA) norms between the departments and co-ordinating the SLA on weekly basis.
- Distinction of being Certified by DGMS, Dhanbad, as a competent First Class Mines Manager to manage Metalliferrous Mines (restricted to opencast only) under MMR-1961.
- EARA approved certified auditor for carrying out internal audit of Environmental Management System for an ISO 14001 Company.
- EARA approved certified auditor for carrying out internal audit of Occupational Health and Safety Management System for an OHSAS: 18001 Company.
- BIS approved certified auditor for carrying internal audit of Quality Management Systems as per ISO-9001:2000 in a company.
- One of the BPR (Business Process Re-engineering) team members and was associated with M/s Andersen Consulting to carry out the studies at ACC Madukkarai for the entire cement plant.
- Carried out Benchmarking Studies. Visited five cement factories of Tamil Nadu region for carrying out benchmarking activities.
- Credited with planning that helped reduce the bags inventory by four days leading to saving of Rs.1.52 Lakhs/annum.
- Applied value engineering to optimise the cement bag material, which led to a saving of Rs.7.8 Lakhs/annum.
- Identified the hidden cost of cement bags and justified a potential opportunity of Rs.1.4 Lakhs on reducing hidden cost by 1paise/bag. By reducing the cost of bag stamping to 2 paisa per bag from 5 paisa per bag, there was a saving of Rs.4.2 Lakhs per annum.
- Championed the suggestion to offload the fabrication and machining jobs being done at the plant to outside parties, which led to a saving of Rs.1.65 Lakhs/annum.
- The existing budgeting system had limitations and reflected unrealistic budgeting. Suggested a different budgeting system based on inputs from MTBF, MTTR, equipment schedule and Reliability of equipment expected.

Successfully carried out the following projects

- On justifying the need for a modified primary crushing system for overall improvements in the quarrying cost of ACC Walayar Mine. With this system a saving of Rs.76 Lakhs per annum was achieved, with a payback of 2.5 years.
- On improving the entire maintenance activities of the cement plant and suggested a means to analyse and prioritise corrective measures for stoppages having high frequency but less in duration.
- Optimising the diesel oil consumption of hydraulic excavators, reducing the diesel consumption by 30% in Lts/hrs and saving 30 Lakhs/annum for the entire Madukkarai Works. The concept was applied to all the ACC plants, resulting in a saving of Rs.360 Lakhs per annum.
- On optimising the blasting efficiency and impact on the operating efficiencies of the loading, hauling, crushing and conveying systems vis-à-vis the total delivered cost.
- To optimise the landed cost of gypsum, bauxite and Mill Scale through linear programming for the cement plant at Madukkarai, and gained business of Rs.4.0 to 16 Lakhs /annum on gypsum
- Designed Modified Belt Conveying System at ACC Walayar Mine, saving Rs.1.5 Lakhs per annum.

Administrative responsibilities in National Institute of Rock Mechanics (2003-2014)

1. Member staff welfare committee of NIRM (2004 – 2009)
2. Member Civil Works Committee of NIRM (2006 – 2007)
3. Nominated as a committee member for finalising Annual Report 2007 – 08 of NIRM. Responsible for the design of the cover page of the report and contributed as an editorial member.
4. Member 'Rajbhasa Samiti' (Hindi – Committee) NIRM (2010 – 2014)
5. Member Standing Purchase Committee (SPC) NIRM (2013 – 2014)

Training Workshop and Conferences Attended

1. Attended and presented a paper in National conference on "Innovative Practices in Rock Mechanics", 06th and 07th Feb 2014, Bengaluru, Organised by National Institute of Rock Mechanics
2. Attended National workshop on "Application of Numerical Modeling in Strata Control for Coal Mines", Oct 29th to Oct 30th 2007, at Indian School of Mines University, Dhanbad.
3. Attended FLAC3D training course, Organised by Itasca Consulting Group Inc.; at Marriot, Miramar, Goa, 30th Sept to Oct 2008.[16 professional development hours]
4. Attended and presented a paper in ICUST 2011, International Conference on Underground Space Technology and the 8th Asian Regional Conference of IAEG, 17th – 19th January, 2011, Bangalore – India.
5. Attended 'Educator's Day 12th -13th Oct 2011, organised by National Instruments, Bangalore – India.

6. Attended and presented a paper in 'Advances in Rock Engineering', ISRM International Symposium 2010 and 6th Asian Rock Mechanics Symposium, 23rd – 27th Oct 2010, New Delhi – India.
7. 4-Weeks residential program on 'Management of Materials for Competitive Excellence' at IIT, Bombay.
8. 4-Weeks residential program on 'Industrial Engineering' at IIT, Bombay.
9. Training on internal audit of Environmental Management System for an ISO 14001 Company conducted by M/s DNV.
10. Quality Management Systems as per ISO-9001:2000 in a company conducted by BIS.
11. Occupational Health and Safety Management System for an OSHAS 18001 Company conducted by M/s DNV.
12. One week field service training of EX-400 hydraulic excavator conducted by M/s TELCO.
13. Seminar cum workshop on 'Better Maintenance Practices of Rotating Machinery' conducted by M/s VIBCONS Engineers and Consultants.
14. Advanced Surpac-2000 training for Mine Planning conducted by MRD Thane.
15. Workshop on 'Managerial skills and Leadership Qualities', Coimbatore.
16. Training on Mine Planning and Selection of HEMM conducted by MRD Thane, ACC.

Visit to Countries Outside India

Country Visited	**Period of Visit**	**Purpose of Visit**
Bhutan	15th Aug to 20th Sep 2006	Consulting Project, Punatsangchhu HEP
Bhutan	05th Jan to 27th Jan 2008	Consulting Project, Mangdechhu HEP
Bhutan	22nd Feb to 03rd Mar 2009	Consulting Project, Mangdechhu HEP
Bhutan	13th Jul to 14th Aug 2010	Consulting Project, Punatsangchhu HEP
Bhutan	06th Sep to 14th Sep 2011	Consulting Project, Mangdechhu HEP
Bhutan	25th Apr to 12th May 2012	Consulting Project, Mangdechhu HEP
Bhutan	23rd Aug to 20th Sep 2013	Consulting Project, Mangdechhu HEP
Bhutan	27th Mar to 2nd Apr 2014	Consulting Project, Naikacchu HPP
Bhutan	08th Jul to 6th Aug 2014	Consulting Project, Naikacchu HPP

Skill Sets

- Rock Engineering
- *In Situ* Deformability
- Data Analysis
- Audits
- Data Acquisition
- Numerical Modelling
- *In Situ* Shear Investigations
- Report Writing
- Trouble shooting
- *In Situ* Stress
- Operations and Maintenance
- Cost Reduction Initiative
- Business Process Re-engineering

Additional Information

- Certified by **DGMS**, Dhanbad, as a competent **First Class Mines Manager** to manage Metalliferrous Mines (restricted to opencast only) under MMR-1961.
- Expertise in **numerical modelling** with Itasca software viz. FLAC^{3D}, 3-DEC, UDEC and FLAC; for a variety of rock-engineering situations.
- Expertise in use of various software from **Rocscience** viz. **Examine^{3D}, Examine^{2D}, Phase2, RocData, RocFall, RocLab, RocPlane, RocSupport, Slide, Swedge, Unwedge**.
- Expertise in designing pillar extraction methods for **underground coal mines**.
- Expertise in surface mine planning using **SURPAC**.
- A keen strategist and planner with skills in conceptualising and affecting process initiatives to enhance plant efficiency and productivity.
- Expertise in implementing cost-saving measures through Value Engineering to achieve substantial reduction in terms of mandays, production cost, raw materials and energy consumption.
- Conversant with various data acquisition systems used for logging transducer outputs.
- Skilled at handling multiple tasks/projects simultaneously in challenging environments with excellent relationship management skills and the ability to relate to people at any level of business/management.

Date:
Place:

(Rabindra Kumar Sinha)

Summary of Externally Sponsored Projects

1 R& D Projects in IIT(ISM)
- 1.a Completed : 01 (Final report pending)
- 1.b Ongoing : 03

2 **FIST Project (PI)** : 01

3 R&D Project in NIRM
- 3.a Completed : 01

4 Consultancy Projects in IIT(ISM)
- 4.a Completed : 17
- 4.b Ongoing : 10

5 Consultancy Projects in NIRM
- 5.a Completed : 61

Details of R&D Projects in IIT(ISM)

Sl. No.	FY	Name of PI/ Co-PI/Members	Name of sponsoring authority	Topic/Field	Date of Sanction	Total value of the Project (Rs. Lakhs)
1	18-19	Advisor: Director IIT(ISM) Coordinator : Prof R M Bhattacharjee **Project Leader (PI): Dr. R K Sinha**	A Coal S&T project funded by Ministry of Coal	Design and Stability of Pillars/Arrays of Pillars for Different Mining Methods in Coal Mine Workings	16 Mar 2018	211
2	19-20	Prof. V M S R Murthy (PI) **Prof. R K Sinha (Co-PI)** Prof. L A Kumaraswamydhass (Co-PI)	DST	Investigations into the planning and design aspects governing the selective coal cutting technology using surface miner for various rock conditions for clean coal production	20 Jun 2019	336.38

Sl. No.	FY	Name of PI/ Co-PI/Members	Name of sponsoring authority	Topic/Field	Date of Sanction	Total value of the Project (Rs. Lakhs)
3	22-23	Prof. R K Sinha	CIL	Establishing CIL Innovation and Incubation Centre in IIT(ISM) Campus	15 Jan 2022	999.95
4	22-23	Prof Sagar Pal (PI) **Prof. Rabindra Kumar Sinha (Co-PI)** Prof. Ejaz Ahmad (Co-PI) Prof Sukha Ranjan Samadder (Co-PI) Prof. Ravi Kumar Gangwar (Co-PI)	Tata Steel	Establishing Tata Steel Innovation Centre on Mining and Mineral Research, (Tata Steel - ICMMR)	24 Jan 2023	231.50

Details of FIST Project

Sl.No.	Project	Name of sponsoring authority	Project Amount Rs. Lakhs	Completion Year	PI/CI
1	FIST Project to install Integrated rock testing system for Rock Mechanics Lab	Department of Science and Technology, Govt. of India	220.00	Ongoing	CI

Details of R&D Projects in NIRM

Sl.No.	Project	Name of sponsoring authority	Project Amount Rs. Lakhs	Completion Year	PI/CI
1	Measurement of in situ stress by hydraulic fracturing method and investigations into the redistribution of in situ stress due to local tectonics at Tandsi and Thesgora mines of WCL and devise a suitable support plan. A Coal S&T project funded by Coal Ministry.	Ministry of Mines, Govt. of India	49.77	2004	CI

Sl. No.	Name of CI	Name of Co-CI	Name of Member	Name of sponsoring authority	Topic/Field	Total value (excluding taxes)
1	Prof R K Sinha	-	-	BCCL	Scientific study to assess the stability of the SAIL Ropeway Trestle and safety of personnel and machinery deployed in Patch X-2 in ASP Colliery EJ Area of BCCL	₹8,47,000.00
2	Prof R K Sinha	-	-	Star Cement Limited	Scientific study and rock mechanics testing of samples of limestone from two locations of M/s Star Cement Limited Meghalaya	₹1,70,500.00
3	Prof R K Sinha	-	-	NHPC Ltd.	Scientific study for rock mechanics testing of samples from Teesta-IV HE Project, NHPC Limited	₹3,70,000.00
4	Prof R K Sinha	-	-	ECL	Scientific study of ongoing SSI (Ningah) OC Patch, Satgram-Sripur Area Under Regulation 106(2) of CMR-2017 in ECL	₹4,19,000.00
5	Prof R K Sinha	-	-	M/s Mythri Infrastructure and Mining India Private Limited	Scientific study of PM properties of rock	₹2,10,000.00
6	Prof. A K Mishra	Prof R K Sinha	-	HZL	Geotechnical lab test on the drill	₹20,96,000.00

Sl. No.	Name of CI	Name of Co-CI	Name of Member	Name of sponsoring authority	Topic/Field	Total value (excluding taxes)
					core samples from all mines of Zawar Group of mines, HZL	
7	Prof. A K Mishra	Prof R K Sinha	Prof. D C Panigrahi	BCCL	Physico-mechanical tests of core samples of B.H No. MKP-71, Kapuria Block, Jharia Coalfields	₹92,57,338.00
8	Prof R K Sinha	Dr. A K Verma	Prof. U K Singh	SAIL	Design of Underground Dams for Chasnalla Colliery	₹11,90,405.00
9	Prof. S Chaudhuri Prof. R M Bhattacharjee	Prof. D C Panigrahi	Prof. Om Prakash Dr. R K Sinha	CIL	Study on underground coal mining in CIL – problems, potential, technology, modernisation, production and safety Part-B	₹ 1,96,38,554/-
10	Prof. Phalguni Sen	Prof R K Sinha	-	ECL	Vetting of SoR in respect of light vehicles in ECL	₹ 3,50,000/-
11	Prof. Phalguni Sen	Prof R K Sinha	-	NCL	Vetting of Schedule of Rate (SoR) for overburden removal & coal transportation	₹ 16,00,000/-
12	Prof. Phalguni Sen	Prof R K Sinha	-	ECL	Vetting of rates and process for preparation of SoR 2017-19 in respect of coal transportation from tippler by 6 wheeler tipper in ECL	₹ 3,00,000/-
13	Prof R K Sinha	-	-	MeSy	Analysis of Hydraulic Fracturing data and giving report	₹ 2,53,000/-
14	Prof. S Chaudhuri Prof. R M Bhattacharjee	Prof. D C Panigrahi	Prof. Om Prakash Dr. R K Sinha	CIL	Study on underground coal mining in CIL – problems, potential, technology,	₹ 17,93,999/-

Sl. No.	Name of CI	Name of Co-CI	Name of Member	Name of sponsoring authority	Topic/Field	Total value (excluding taxes)
					modernisation, production and safety Part-A	
15	Prof. Phalguni Sen	Prof R K Sinha	-	M/s Jai Yamuna Ji Developers	To define mechanised, semi mechanised and manual mining methods for river bed sand mining and their environmental implications	₹ 2,00,000/-
16	Prof. V K Singh Dr. R K Sinha	Prof. D C Panigrahi	Prof. S Chaudhuri Dr. D P Mishra	SECL	Joint study with CSIR-CIMFR in terms of the order of Houourable National Green Tribunal, Bhopal for taking up the job of extinguishing and containing fire and also prevent it from further spreading at Gare Palma IV/2&3 OCM Raigarh Area of SECL	₹ 13,44,200/-
17	Prof. M Jawed	Prof R K Sinha		CCL	Designing of Rhombus coal pillars and support with roadway stability of Sawang-C seam of Govindpur Project (U/G), Kathara Area, CCL	₹5,00,000

Details of Ongoing Consultancy Projects in IIT(ISM)

Sl. No.	FY	Name of CI	Name of Co-CI	Name of sponsoring authority	Topic/Field	Date of Sanction	Total value (excluding taxes)
1	24-25	Prof R K Sinha	-	ICML	Scientific study of slope concerning distance to be maintained from public road to quarry edge in Sarisatolli Coal Mine	27.06.24	₹14,95,800
2	24-25	Prof R K Sinha	-	NHPC Ltd.	Testing of Swelling Properties of Phyllitic Rock from Teesta-VI HE Project of Lanco Teesta Hydro Power Limited.	04.11.24	₹1,05,000
3	24-25	Prof R K Sinha	-	M/s Ergo Exergy Technology Inc.	Elasto plastic RM modelling with FLAC3D for the pilot operations of Coal Gassification in the Kasta West project	10.09.24	₹25,40,920
4	24-25	Prof R K Sinha	-	M/s Ergo Exergy Technology Inc.	Determination of physico mechanical properties of rock for the proposed pilot operations of Coal Gassification in the Gare Palma Sector 1 project	10.07.24	₹7,10,920
5	24-25	Prof R K Sinha	-	M/s Ergo Exergy Technology Inc.	Elasto plastic RM modelling with FLAC3D for the pilot operations of Coal Gassification in Gare Palma Sector-1 project	10.07.24	₹18,30,000
6	24-25	Prof R K Sinha	Prof. M S Alam	M/s Khas Karanpura Mining Private Limited	Scientific study for pit and dump slope stability for Khas Karanpura UG coal mine of CCL as per requirements of Regulation 106 of CMR, 2017 and DGMS guidelines	10.07.24	₹17,75,000
7	24-25	Prof R K Sinha	Prof V K Sinha	BCCL	Scientific study of the Effectiveness of Stowing (Bottom Ash Stowed) in B-1 Panel and recommending the method of Depillaring of the Overlying Local-2 Seam	18.06.24	₹19,85,000
8	24-25	Prof. R M	Prof. R K Sinha	M/s INDU SCCL	Feasibility study of the DPR of Moonidih	16.05.24	₹18,00,000

Sl. No.	FY	Name of CI	Name of Co-CI	Name of sponsoring authority	Topic/Field	Date of Sanction	Total value (excluding taxes)
		Bhattacharjee	Prof. Vijay K Sinha Prof. Ashok Kumar	CORUM Consortium	XV Seam taking into consideration of prevailing adverse mining conditions		
9	23-24	Prof R K Sinha	Prof V K Sinha	M/s INDU SCCL CORUM Consortium	Scientific study in respect of Assessment of optimal size of the face length of Longwall Panel of Moonidih XV Seam”	14.12.23	₹4,19,000
10	23-24	Prof R K Sinha	Prof V K Sinha	R K Green Mining Pvt. Ltd.	Scientific study in respect of method of working, ultimate pit slope, dump slope and advise on monitoring of slope stability for Itapara OCP, Salanpur Area ECL (Reg. -106 of CMR 2017)	08.11.23	₹4,19,000

Details of Consultancy Projects in NIRM

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
1	Determination of in situ stress measurements by hydraulic fracturing method and by use of flat jack to evaluate principal stress tensors in the vicinity of proposed powerhouse for the design and support of proposed cavity, Subansiri Upper Hydroelectric Project,	GE-0204 C	NHPC Ltd.	14.00	2003	CI
2	Determination of in situ shear parameters by direct shear test and deformability parameters by plate loading as well as Goodman jack along the proposed dam axis for design of concrete gravity dam, Subansiri Upper Hydroelectric Project	GE-0203 C	NHPC Ltd.	7.60	2003	CI
3	Determination of in situ deformability parameters by plate loading experiment and in situ shear parameters by direct shear test inside an exploratory drift along the proposed dam axis, Subansiri Middle Hydroelectric Project	GE-0302 C	NHPC Ltd.	12.00	2003	CI
4	Determination of in situ deformability parameters by plate loading experiment inside an exploratory drift leading to the proposed powerhouse cavity for design of support system, Subansiri Middle Hydroelectric Project, Arunachal Pradesh.	GE-0303 C	NHPC Ltd.	9.01	2003	CI
5	Measurement of in situ stress by hydraulic fracturing method and investigations into the redistribution of in situ stress due to local tectonics at Tandsi and Thesgora mines of WCL and devise a suitable support plan. A Coal S&T project funded by Coal Ministry.	MT-117	Ministry of Mines, Govt. of India	49.77	2004	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
6	Determination of in situ stress by hydraulic fracturing method and in situ deformability parameters by using Goodman jack in vicinity of the proposed powerhouse site, Parbati Stage-III Hydroelectric Project, Himachal Pradesh.	GE-0304 C	NHPC Ltd.	9.54	2004	CI
7	Determination of in situ stress by hydraulic fracturing method, in situ deformability by Plate loading experiment and in situ shear parameters by direct shear test inside an exploratory drift on the left bank downstream to the confluence of river Allain Duhangan for the design of underground powerhouse cavity, Allain Duhangan Hydroelectric Project, Himachal Pradesh.	GE-0301 C	Allain Duhangan Power Corporation Ltd., LNJ Bhilwara Group	13.55	2004	CI
8	Determination of in situ stress by hydraulic fracturing method in vicinity of the proposed sedimentation chamber, in situ deformability parameters by plate loading experiment along the proposed dam axis, Pala Maneri Hydroelectric Project, Uttaranchal	GE-0401 C	UJVNL	12.82	2004	CI
9	Determination of in situ shear characteristics by direct shear test along the proposed dam axis for design of 75 m high concrete gravity dam, Pala Maneri Hydroelectric Project, Uttaranchal.	GE-0402 C	UJVNL	12.00	2004	PI
10	Determination of in situ stress by hydraulic fracturing method in vicinity of the proposed egg shaped underground cavern for the LPG storage, Visakhapatnam, Andhra Pradesh.	GE-0403C	L&T Ramboll and SALPG	7.50	2005	CI
11	Determination of in situ deformability parameters by plate loading experiment and in situ shear characteristics by direct shear test	GE-0404 C	NHPC Ltd.	13.00	2005	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
	inside two exploratory drifts(aligned along dam axis) on the left bank of Diabang river for design of solid straight concrete gravity dam, Dibang Multipurpose Project, Arunachal Pradesh.					
12	Determination of in situ deformability parameters by plateloading experiment and in situ shear characteristics by direct shear test inside two exploratory drifts on the right bank of Dibang river, Dibang Multipurpose Project, Arunachal Pradesh.	GE-0405 C	NHPC Ltd.	11.00	2005	CI
13	Determination of in situ deformability parameters by plate loading experiment and in situ shear characters by direct shear test inside the drift numbered LDR – 4 aligned along proposed dam axis, Dibang Multipurpose Project, Arunachal Pradesh	GE-0406 C	NHPC Ltd.	9.00	2005	CI
14	Determination of in situ stress by hydraulic fracturing method on two fold axes at Kunni Khadd and Kasoli Khadd, to estimate the effect of high stress on HRT passing through it, Rampur Hydroelectric Project, Himachal Pradesh.	GE-0407 C	SJVNL	7.00	2006	CI
15	Determination of in situ stress by hydraulic fracturing method, in situ deformability parameters by Plate loading experiment and in situ shear characteristics by direct shear test inside an exploratory drift in vicinity of the proposed Powerhouse of Dibang Multipurpose Project, Arunachal Pradesh.	GE-0501 C	NHPC Ltd.	11.75	2006	CI
16	Determination of in situ deformability by plate loading experiment inside niches excavated in different types of rocks encountered along different tunnels viz. T1P1, T2P1, T3P2 and T5P1 of proposed	GE-0503 C	Konkan Railways	7.50	2006	PI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
	USBRL Project, KRCL, J&K.					
17	Determination of in situ by use of flat jack inside niches excavated in different types of rocks encountered along different tunnels viz. T1P1, T2P1, T3P2 and T5P1 of proposed USBRL Project, KRCL, J&K	GE-0504 C	Konkan Railways	12.00	2006	CI
18	Determination of in situ deformability parameters by use of Goodman jack and in situ stress by hydraulic fracturing method in vicinity of the proposed powerhouse cavity at Punatsangchhu Hydroelectric Project, Bhutan.	GE-0505 C	WAPCOS	15.90	2007	CI
19	Determination of in situ deformability by plate loading experiment as well as by use of Goodman jack and in situ stress by hydraulic fracturing method in vicinity of the proposed sedimentation chamber at Punatsangchhu Hydroelectric Project, Bhutan.	GE-0506 C	WAPCOS	10.00	2007	CI
20	Determination of in situ deformability by plate loading experiment as well as by use of Goodman jack and in situ stress by hydraulic fracturing method in vicinity of the proposed powerhouse chamber, Pala Maneri Hydroelectric Project, Uttaranchal.	GE-0507 C	UJVNL	20.00	2007	CI
21	Determination of in situ deformability by use of Goodman jack and in situ stress by hydraulic fracturing method in vicinity of the proposed Surge shaft and different sections along HRT at Pala Maneri Hydroelectric Project, Uttaranchal.	GE-0508 C	UJVNL	18.50	2007	CI
22	Determination of in situ stress by hydraulic fracturing method and determination of in situ deformability parameters by use of Goodman jack in vicinity of the proposed powerhouse chamber	GE-0601 C	Energy Infratech	6.25	2007	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
	from the exploratory drift (with rock cover of 100 m), Malana Hydroelectric Project, Himachal Pradesh.					
23	Determination of in situ stress parameters by hydraulic fracturing at the proposed powerhouse chamber from the construction adit (with rock cover of 416 m) between tail race tunnel and pressure shaft, Malana Stage II Hydroelectric Project, Himachal Pradesh	GE-0701 C	Energy Infratech	2.72	2008	CI
24	Determination of in situ stress by hydraulic fracturing method and deformability parameters by Goodman jack at the proposed underground powerhouse and transformer hall of Sawra Kuddu Hydroelectric Project, Himachal Pradesh	GE-0702 C	HPEB	20.93	2008	CI
25	Determination of in situ deformability parameters by plate loading experiment and in situ shear parameters of rock mass of dam foundation for the design of proposed concrete gravity dam, Mangdechhu Hydroelectric Project, Bhutan	GE-0703 C	NHPC Ltd.	14.94	2008	CI
26	Determination of in situ stress by hydraulic fracturing method at the proposed Underground LPG Cavern at Mangalore, Karnataka.	GE-0704 C	RITES	5.00	2008	CI
27	Determination of in situ stress by hydraulic fracturing inside an exploratory drift excavated up to the proposed desilting chamber, Vishnugad Pipalkoti Hydroelectric Project.	GE-0802 C	THDC Ltd.	11.01	2009	CI
28	Determination of in situ deformability parameters of rock mass and shear zone exposed at different locations of surge chamber site, Subansiri Lower Hydroelectric Project	GE-0803 C	NHPC Ltd.	9.61	2008	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
29	Determination of in situ stress by hydraulic fracturing and deformability parameters by use of Goodman jack inside a drift excavated upto the proposed powerhouse, Mangdechhu Hydroelectric Project, Bhutan	GE-0707 C	NHPC Ltd.	11.92	2008	CI
30	Determination of in situ stress parameters by hydraulic fracturing method at the proposed powerhouse cavity, Vishnugad Pipalkoti Hydroelectric Project	GE-0801 C	THDC Ltd.	16.63	2009	CI
31	Determination of in situ stress by hydraulic fracturing and deformability parameters at proposed powerhouse of Punatsangchhu Stage – I, Hydroelectric Project (1095 MW)	GE-0804 C	WAPCOS	8.43	2008	CI
32	Determination of in situ permeability and groutability parameters up to 50 m depth at proposed powerhouse of Punatsangchhu Stage –I Hydroelectric Project, Bhutan.	GE-0805 C	WAPCOS	8.14	2008	CI
33	Determination of in situ deformability parameters by plate loading method and in situ stress by hydraulic fracturing method inside the proposed exploratory drift at Teesta Stage – III Hydroelectric Project (300MW), Sikkim.	GE-0806 C	Teesta Urja Limited	17.52	2009	CI
34	Determination of in situ deformability by plate loading experiment and in situ shear parameters by direct shear test at proposed Upper Demwe Hydroelectric Project (1800 MW)	GE-0807 C	Energy Infratech	16.29	2009	CI
35	Determination of in situ stress and stress gradient between 184 ML to 0 ML at Kolihan Copper Mines of Hindustan Copper Limited.	GE-0502 C	Hindustan Copper	8.00	2011	PI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
			Limited			
36	Determination of in situ stress by hydraulic fracturing method for the design of stoping operation at Devpura soapstone mines, Udaipur, Rajasthan.	GE-0901 C	Golcha Group	7.00	2009	CI
37	Determination of in situ stress by hydraulic fracturing method for the design of powerhouse cavern and transformer hall, Naitwar Mori Jakohl Sankari Hydroelectric Project, Uttarakhand.	GE-0809 C	SJVNL	18.21	2009	CI
38	Determination of in situ stress at a deeper section inside a drift to the proposed powerhouse and determination of in situ deformability of the foundation of rock on the left bank of the dam axis, Dibang Multipurpose Project, Arunachal Pradesh.	GE-0810 C	NHPC Ltd.	15.73	2010	CI
39	Determination of in situ deformability of rock mass and in situ shear characteristics of the rock along the proposed dam axis, Dibang Multipurpose Project, Arunachal Pradesh.	GE-0811 C	NHPC Ltd.	14.05	2010	CI
40	Determination of in situ stress inside a drift to the proposed powerhouse gullet, determination of in situ shear parameters of the rock mass and determination of the deformability parameters of the rock mass using borehole dilatometer at the proposed powerhouse, Baglihar Stage II Hydroelectric Project, Jammu and Kashmir.	GE-0902 C	Jaiprakash Associates Limited	38.05	2010	CI
41	Determination of in situ stress at the proposed desilting cavity under high rock cover, determination of in situ rock deformability modulus using plate loading experiment along various segments	GE-0906 C	WAPCOS	25.49	2010	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
	of the HRT and determination of in situ shear parameters of rock mass along the proposed dam axis, Punatsangchhu Hydroelectric Project, Bhutan.					
42	Determination of in situ permeability and groutability of rock mass encountered at proposed desiting chamber, Punatsangchhu Hydroelectric Project, Bhutan.	GE-1001 C	WAPCOS	32.50	2011	CI
43	Determination of in situ permeability and groutability of rock mass encountered at proposed powerhouse cavity, Punatsangchhu Hydroelectric Project, Bhutan.	GE-0903 C	WAPCOS	28.65	2010	CI
44	Determination of in situ stress by hydraulic fracturing method for the design of powerhouse, Malshejghat Pumped Storage Scheme, Maharashtra.	GE-0904 C	THDC Ltd.	34.19	2010	CI
45	Determination of in situ stress by hydraulic fracturing method for the design of pressure shaft, Malshejghat Pumped Storage Scheme, Maharashtra.	GE-0905 C	THDC Ltd.	21.50	2010	CI
46	Determination of in situ stress for the design of pressure shaft, Rangit Hydroelectric Project, Sikkim	GE-1002 C	Sikkim Hydro Power Ventures Limited	7.72	2011	CI
47	Determination of in situ stress at deeper sections of Rajpura Dariba Mine, for the design of stopes, Hindustan Zinc Limited, Dariba, Rajasthan.	GE-1004 C	Vedanta Group	15.44	2011	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
48	Determination of in situ stress inside a drift to the desanding chamber to freeze the orientation of desanding chamber, Karcham Shongtong Hydroelectric Project, Himachal Pradesh.	GE-1005 C	HPSEB	12.13	2011	CI
49	Evaluation of foundation rock response using static plate load test and vertical cyclic plate load test at different locations for Rajasthan Atomic Power Project Unit 7 & 8, Rawatbhata, Rajasthan.	GE-1201C	NPCIL	16.25	2012	CI
50	Determination of in situ shear parameters of rock mass for the design of concrete gravity dam at Mangdechhu Hydroelectric Project, Bhutan	GE-1101 C	NHPC Ltd.	33.98	2012	CI
51	Determination of in situ deformability of rock mass by plate loading experiment and determination of in situ shear parameters of rock mass for design of 78 m high concrete gravity dam, Pare Hydroelectric Project, Arunachal Pradesh	GE-1103 C	WAPCOS	20.40	2012	PI
52	Determination of in situ stress for the design of underground powerhouse cavity at Etalin Hydroelectric Project, Arunachal Pradesh.	GE-1105 C	Jindal Steel and Power Limited	18.75	2012	CI
53	Determination of in situ deformability parameters of dam construction material by pressure meter test at Mullai Periyar Projecct, Tamilnadu	GE-1107 C	Honourable Supreme Court of India and Govt. of Tamil Nadu	11.03	2012	CI
54	Determination of in situ stress for the design of powerhouse	GE-1106 C	NHPC Ltd.	21.51	2013	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
	cavern for Kamla Hydroelectric Project, Middle Subansiri, Arunachal Pradesh					
55	Determination of in situ stress for design of underground cavern for pump house, Pranhita Chevalla SS – Package 23, Andhra Pradesh	GE-1202C	Patel Engineering	13.82	2013	CI
56	Determination of in situ deformability of rock mass by plate loading experiment and determination of in situ shear parameters of rock mass for design of power house cavity at Mangdechhu Hydroelectric Project, Bhutan.	GE-1301C	Mangdechhu Hydro Power Authority	37.74	2013	CI
57	Determination of in situ deformability of rock mass by plate loading experiment, determination of in situ shear parameters of rock mass and determination of the in situ stress for design of power house cavity at Teesta-IV Hydroelectric Project, Sikkim	GE-1203 C	NHPC Ltd.	27.80	2013	CI
58	Determination of shear and deformability characteristics of Class-III rockmass encountered at powerhouse cavity, Mangdechhu Hydroelectric Project, Bhutan	GE-1302 C	Mangdechhu Hydro Power Authority	27.62	2013	CI
59	Determination of in situ stress at the proposed powerhouse cavity of the Attunli Hydroelectric Project for the design of support system, Arunachal Pradesh	GE-1303 C	Jindal Steel and Power Limited	33.70	2014	CI
60	Determination of in situ stress for design of underground cavern for pump house, Pranhita Chevalla SS – Package 12, Andhra Pradesh	ID 1303 C	Megha Engineering and Infrastructur	10.11	2014	CI

Sl. No.	Project	Project No.	Client	Project Amount (₹ Lakhs)	Completion Year	PI/CI
			es Ltd.			
61	Determination of in situ deformability of rock mass by plate loading experiment and determination of in situ shear parameters of rock mass for design of concrete gravity dam at Nikachhu Hydroelectric Project, Bhutan	GE-1305 C	Druk Green Power Corporation Ltd.	46.17	2014	CI

Annexure-B

Updated as on 6th January 2025

Summary of Publications

PUBLICATIONS	Number
Publications in National Journals	14
Publications in International Journals	18
Publications in International Conferences	12
Publications in National Conferences	19
Publication of S&T (R&D) Report	01
Contribution of Chapter in International Books	02
GRAND TOTAL	**66**

Publications in National Journals

1. Bellapu HVS, Sinha RK, Naik SR (2023) "Estimation of Modulus of Deformation by Different Methods for an Underground Cavern—A Case Study." Indian Geotechnical Journal 53 (3), 644-650
2. S Samanta, RK Sinha, PB Chakrabarty, H Kumar (2022) "Deployment of Continuous Miner in under Ground Coal Mine: A Case Study of Sarpi Mine." Journal of The Institution of Engineers (India): Series D 103 (2), 453-471
3. S Samanta, RK Sinha, PB Chakrabarty, H Kumar (2022) "A Numerical Modelling Approach for Finding the Stability of Snook during Depillaring: A Case Study of Jhanjra Mine."Journal of The Institution of Engineers (India): Series D 103 (1), 1-11
4. S Samanta, RK Sinha, PB Chakrabarty, H Kumar (2022) "A Numerical Modelling Approach to Find the Stability of RIB and Snook in Mechanised Depillaring Panel—A Case Study of Kurja Mine." Journal of Mines, Metals and Fuels 70 (4), 191-202
5. R Bilash Prajapati, R Kumar Sinha, RN Gupta, S Kumar, D Prajapati (2022) "Artificial Intelligence Model for Prediction of Local and Main FALL in caving Panel of Bord and Pillar Method of Mining." Journal of Mines, Metals & Fuels 70 (4)
6. S Samanta, RK Sinha, PB Chakrabarty, H Kumar (2022) "Amelioration of production and safety in bord and pillar work through the deployment of continuous miner technology." Journal of Mines, Metals & Fuels 70 (2)
7. RB Prajapati, RK Sinha, RN Gupta, S Kumar (2022) "The prediction of caving sequence in bord and pillar workings using Random Forest algorithm." Journal of Mines, Metals & Fuels 70 (2)
8. SS Prasad, RK Sinha, K Sudheer (2021) "Application of continuous miner technology for extraction of deep seated coal seam under hard roof conditions-a case study of Churcha mine." Journal of Mines, Metals & Fuels 69 (12)
9. SS Prasad, RK Sinha, B Rambabu (2021) "Numerical modelling approach for assessment of factor of safety of ribs in continuous miner depillaring panels-a case study of Churcha mine." Journal of Mines, Metals & Fuels 69 (11)
10. Verma, A. K., Rabindra Kumar Sinha, S. Sardana, M. Jaswal, and T. N. Singh. (2021). "Investigation into the Rockfall Hazard along Lengpui-Aizawl Highway, NH-44A, Mizoram, India." Indian Geotechnical Journal 50(6).
11. Subrahmanyam, D. S., Sinha, R. K., & Shyam, G. (2015). Deformability and shear strength properties of rock mass in shear zone area and their impact on the design of major

underground structures in hydroelectric projects. Journal Indian Geological Congress, 7(2), 17–22.
12. Sengupta, S., Subrahmanyam, D. S., & Sinha, R. K. (2014). State of ground stress its use and measurement in rock engineering with special reference to weak rocks. ISRM (India) Journal, 2(1), 16–24.
13. Sinha, R. K., Jawed, M., & Sengupta, S. (2013). Influence of anisotropic stress conditions on design of development workings in bord and pillar mining. ISRM (India) Journal, 2(1), 16–24. India.
14. Sinha, R. K., Sengupta, S., Subrahmanyam, D. S., & Joseph, D. (2007). Verification of stress concentration and displacement around a circular tunnel using a 3D boundary element program EXAMINE3D. MineTECH'07, The Indian Mining & Engineering Journal, 85–89. India.

Publications in International Journals

1. Kumar S, Sinha RK, Jawed M (2023) "Numerical simulation of depillaring panel at higher depth-Jamadoba mine case study." Ain Shams Engineering Journal 14 (4), 101939
2. S Sardana, RK Sinha, AK Verma, M Jaswal, TN Singh (2022) "A Semi-Empirical Approach for Rockfall Prediction Along the Lengpui-Aizawl Highway Mizoram, India." Geotechnical and Geological Engineering 40 (11), 5507-5525
3. S Sardana, RK Sinha, AK Verma, TN Singh (2022) "Investigations into the freeze–thaw-induced alteration in microstructure and deteriorative responses of physico-mechanical properties of Himalayan rock." Bulletin of Engineering Geology and the Environment 81 (7), 269
4. S Sardana, RK Sinha, AK Verma, M Jaswal, TN Singh (2022) "Influence of freeze–thaw on the stability of road cut slopes—a case study in the Indian Himalayan region." Canadian Geotechnical Journal 60 (1), 107-112
5. Rajpurohit, S.S., R.K. Sinha, P. Sen, and V. Adak. (2020). "Effect of the Rock Properties on Sawability of Granite Using Diamond Wire Saw in Natural Stone Quarries." Arabian Journal of Geosciences 13(21).
6. Jaswal, M., R.K. Sinha, and P. Sen. (2020). "Delineation of Phreatic Surface in Soil Type Slope—A Comparative Study Using Physical and Numerical Modeling." Journal of Mining Science 56(3).
7. Biswas, P., Sinha, R. K., Sen, P., & Rajpurohit, S. S. (2020). Determination of optimum cut-off grade of an open-pit metalliferous deposit under various limiting conditions using a linearly advancing algorithm derived from dynamic programming. Resources Policy, 66(January), 101594. https://doi.org/10.1016/j.resourpol.2020.101594
8. Kumar, S., Mishra, A. K., Choudhary, B. S., Sinha, R. K., Deepak, D., & Agrawal, H. (2020). Prediction of Ground Vibration Induced Due to Single Hole Blast Using Explicit Dynamics. Mining, Metallurgy and Exploration, 37(2). https://doi.org/10.1007/s42461-019-00162-z
9. Murlidhar, Bhatawdekar Ramesh et al. 2020. "The Effects of Particle Swarm Optimisation and Genetic Algorithm on ANN Results in Predicting Pile Bearing Capacity." International Journal of Hydromechatronics 3(1): 69–87.
10. Sinha, R. K., Jawed, M., & Sengupta, S. (2019). An approach for support design in depillaring panels of coal mines. Arabian Journal of Geosciences, 12(21). https://doi.org/10.1007/s12517-019-4858-2
11. Das, A. J., Mandal, P. K., Paul, P. S., & Sinha, R. K. (2019). Generalised Analytical Models for the Strength of the Inclined as well as the Flat Coal Pillars using Rock Mass Failure Criterion. Rock Mechanics and Rock Engineering, 52(10), 3921–3946. https://doi.org/10.1007/s00603-019-01788-7
12. Das, A. J., Mandal, P. K., Paul, P. S., Sinha, R. K., & Tewari, S. (2019). Assessment of the Strength of Inclined Coal Pillars through Numerical Modelling based on the Ubiquitous Joint

Model. Rock Mechanics and Rock Engineering, (0123456789). https://doi.org/10.1007/s00603-019-01826-4
13. Rajpurohit, S. S., & Sinha, R. K. (2018). Influence of physico-mechanical properties of Indian dimension stones on cutting rate of diamond wire saw. Arabian Journal of Geosciences (2018), 11(564), 2-10–564.
14. Jawed, M., & Sinha, R. K. (2018). Design of rhombus coal pillars and support for Roadway Stability and mechanizing loading of face coal using SDLs in a steeply inclined thin coal seam — a technical feasibility study. Arabian Journal of Geosciences, 11(415), 7-14–415.
15. Sinha, R. K., Jawed, M., & Sengupta, S. (2015). Design of support system in depillaring panel using numerical modelling – A case study. International Journal of Earth Sciences and Engineering, 08(06), 2678–2686.
16. Sinha, R. K., Jawed, M., & Sengupta, S. (2015). Influence of rock mass rating and in situ stress on stability of roof rock in bord and pillar development panels. International Journal of Mining and Mineral Engineering, 6(3), 258–275. doi:10.1504/IJMME.2015.071175. Switzerland.
17. Jawed, M., Sinha, R. K., & Sengupta, S. (2013). Chronological development in coal pillar design for bord and pillar workings: A critical appraisal. Journal of Geology and Mining Research, 5(1), 1–11. doi:10.5897/JGMR12.010. Nigeria.
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Publications in International Conferences

1. S Sardana, RK Sinha, M Jaswal, AK Verma, TN Singh (2021) “Influence of Freeze-thaw Cycles on the Velocity of Elastic Waves in Saturated Rock Specimens” International Conference on Geotechnical Challenges in Mining, Tunneling and Underground Infrastructures.
2. HV Sekar Bellapu, RK Sinha, SR Naik (2021) “Estimation of Deformation Modulus of Rock Mass for an Underground Cavern Based on Back Analysis.” International Conference on Geotechnical Challenges in Mining, Tunneling and Underground Infrastructures
3. K Sudhakar, RK Sinha, SR Naik (2021) “Safety and Stability Monitoring of Underground Structures-Role of Geotechnical Instruments.” International Conference on Geotechnical Challenges in Mining, Tunneling and Underground Infrastructures.
4. Sardana, S. et al. 2020. “Stability Assessment of a Road Cut Slope Using 3D Numerical Simulation – a Case Study.” In Rock Mechanics for Natural Resources and Infrastructure Development- Proceedings of the 14th International Congress on Rock Mechanics and Rock Engineering, ISRM 2019,.
5. Rajpurohit, S. S., Sinha, R. K., & Sen, P. (2020). Influence of Cerchar hardness index of hard rock granite on wear of diamond tools. Materials Today: Proceedings,. https://doi.org/10.1016/j.matpr.2020.03.273
6. Das, A J et al. 2017. “Effect of the Strata Inclination during Underground Extraction of the Coal Seams.” In 7th Asian Mining Congress, 8-11 Nov 2017, Kolkata, India, The Mining Geological and Metallurgical Institute of India (MGMI), , 223–38.
7. Subrahmanyam, D. S., Sengupta, S., Sinha, R. K., & Shyam, G. (2013). Determination of in-situ stress at desilting chamber of Punatsangchhu hydroelectric project (Bhutan) to reconfirm its orientation influenced by topography - A case study. 7th International Conference on case histories in Geotechnical Engineering, Chicago, April 29 - May 4, 2013. Chicago, USA.
8. Sengupta, S., & Sinha, R. K. (2011). Assessment of Impact of Nearby Excavations on the Deformability and Stress Conditions around a Proposed Powerhouse by Field and Numerical Modeling. ARMA 45th US Rock Mechanics / Geomechanics Symposium, San Francisco,

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Publications in National Conferences

1. Sinha, Rabindra Kumar. (2020). "Application of in Situ Stress in Design of Supports for Depillaring Panels of Underground Coal Mines." In Mining Industry: Challenges & Opportunities – 2020 (MICO'20)Community Hall, Koyla Nagar, Dhanbad, Jharkhand from 10th -11th Jan 2020, Dhanbad, India: IMMA.
2. Sardana, S., Sinha, R. K., Verma, A. K., & Singh, T. N. (2020). Design of rockfall barrier for a road cut slope in hilly region. In National Conference on Advances in Mining (AIM-2020) (pp. 400–404). Dhanbad, India: CSIR CIMFR. https://doi.org/10.1055/s-2008-1040325
3. Rajpurohit, S. S., Sinha, R. K., Sen, P., & Chand, C. S. (2020). Mining Of Granites As Dimensional Stone In Andhra Pradesh And Telangana State , India. In Satyendra K Singh (Ed.), National Conference on Advances in Mining (AIM-2020) (Vol. 13, pp. 199–209).
4. Arshad, S., Kumar, H., & Sinha, R. K. (2018). Study on Variation In Geotechnical Properties of Practicing Backfill Material on Addition of Mill Tailing Collected From Tailing Pond . In Proceeding for International Conference on Recycling and Waste Management (ICRWM-19) (pp. 45–48). Varanasi, Uttar Pradesh 45.
5. Sinha, R. K. (2018). Hydraulic fracturing for in situ stress measurement and its application in the design of underground structures in Rock - few case studies. In S. R. Mallick (Ed.), Keynote address in Current Practices in Mining & Allied Industries (CMPAI-2018), Keonjhar, Oct 6-7, 2018. Keonjhar: GEC Keonjhar.
6. Sardana, S., Sinha, R. K., Verma, A. K., & Singh, T. N. (2018). Effect of shape of falling rock block on kinetic energy and fall-out volume. In S. . Singh, S. K. Roy, R. Kumar, & P. K. Singh (Eds.), Technological advancements and emerging mining methods-TAEMM-2018 (pp. 248–251). Dhanbad: CSIR-CIMFR.
7. Jaswal, M., Sinha, R. K., & Sen, P. (2018). Estimating flow through embankment dams for prevention of piping and its subsequent collapse. In S. . Singh, S. K. Roy, R. Kumar, & P. K. Singh (Eds.), Technological advancements and emerging mining methods-TAEMM-2018 (pp. 256–262). Dhanbad: CSIR-CIMFR.
8. Kadiyala, S., Naik, S. R., & Sinha, R. K. (2018). Developments in geotechnical instrumentation and long-term monitoring of large underground caverns. In S. . Singh, S. K.

Roy, R. Kumar, & P. K. Singh (Eds.), Technological advancements and emerging mining methods-TAEMM-2018 (pp. 219–232). Dhanbad: CSIR-CIMFR.

9. Sen, P., Sinha, R. K., & Kumar, S. (2018). Impact of sand mining on environment and their implication. In P. K. Singh & S. K. Ray (Eds.), Recent Challenges in Mining Industry (RCMI 2018) (pp. 313–318). Dhanbad: Central Institute of Mining and Fuel Research.
10. Singh, V. K., & Sinha, R. K. (2017). Latest trends in strata control in longwall mining with special reference to strata monitoring techniques. In Technical Workshop on Latest Trends in Strata Control in Longwall Mining with Special Reference To Strata Monitoring Techniques, Directorate General of Mines Safety- Dhanbad, 20-01-2017 (pp. 1–7).
11. Sinha, R.K. & Pathak, R.K., (2014). Challenges for Applications of Robotics in Mining Engineering. In National Seminar on "Robotics: Applications & Challenges" Sept-15. Ranchi: ICFAI University Ranchi, Jharkhand.
12. Sinha, R. K., Subrahmanyam, D. S., Shyam, G., & Sengupta, S. (2014). Understanding the mining induced stresses by actual measurement and numerical modeling in a deep lead zinc mine. National Seminar on Innovative Practices in Rock Mechanics (IPRM-2014), The Capitol Hotel, Raj Bhawan Road, Bengaluru, Organised by NIRM.
13. Shyam, G., Subrahmanyam, D. S., Sinha, R. K., & Immanuel, T. Y. M. (2014). Evaluation of deformability characteristics of rock mass at Pare hydroelectric project for the design of dam foundation. National Seminar on Innovative Practices in Rock Mechanics (IPRM-2014), The Capitol Hotel, Raj Bhawan Road, Bengaluru, Organised by NIRM.
14. Sinha, R. K., Sengupta, S., Subrahmanyam, D. S., & Joseph, D. (2005). Renewal of mining lease lying in forest area: a critical appraisal of the existing laws in India. Conference on Technological Advancements and Environmental Challenges in Mining and Allied Industries in the 21st Century, 5 - 6 Feb 2005. NIT Rourkela - India.
15. Sinha, R. K., Sengupta, S., Subrahmanyam, D. S., & Joseph, D. (2007). Review of computational software used for design of structures in rock. Indian Mining Congress on Emerging Trends in Mineral Industry, Organised by Mining Engineer's Association of India, National Headquarters and Rajasthan Chapter, July 13-15, 2007. Udaipur, India.
16. Sinha, R. K., Sengupta, S., & Gupta, R. N. (2004). Implementing total productive maintenance (TPM) in mineral industry. ENTMS 2004 - Geomintech Symposium.
17. Sengupta, S., Subrahmanyam, D. S., Joseph, D., & Sinha, R. K. (2009). Stress perturbations due to presence of an intrusive and numerical simulation to understand the effect - A case study in a metal mine. (S. S. Rathore & S. C. Jain, Eds.)21st National Convention of Mining Engineers and National Seminar on Technological Advances in Mining Industry, Dec 2009. Udaipur, India: Himanshu Publications, New Delhi.
18. Mathur, L. N., & Sinha, R. K. (1998). Greening the environment is a corporate responsibility. Workshop on Basic Need for Creating a Clean Safe and Congenial Work Environment, Tamilnadu and Kerala Mines Safety Association, TANKEMSA. Salem, Tamilnadu - India.
19. Sinha, R. K. (1999). Khan khanij aur khanan. Souvenir, Mines Environmental and Mineral Conservation Council, Tamilndau Region. Madukkarai - Coimbatore - India.

Publication of S&T Report

1. Sengupta, S., Chakrabarti, S., Gupta, R. N., Subrahmanyam, D. S., Joseph, D., Sinha, R. K., Kar, A., et al. (2004). Measurement of In Situ Stress by Hydrofracture Method and Investigations on Redistribution of In Situ stress due to Local Tectonics and Methods of Workings at Tandsi and Thesgora Mines, WCL to Devise a Suitable Support Plan SSR. NIRM Coal S&T Project Report MT-117, Funded by Ministry of Coal, Government of India.

Contribution of Chapter in International Books

1. P Biswas, RK Sinha, P Sen (2022) “Advanced Analytics for Dynamic Programming.” Advanced Analytics in Mining Engineering: Leverage Advanced Analytics in Mining Industry to Make Better Business Decisions. Pages 307-322, Publisher: Springer International Publishing
2. Sengupta, S., Subrahmanyam, D.S. & Sinha, R.K., 2013. Estimation of the impact of mining on stresses by actual measurements in pre and post mining stages by hydrofracture method - a case study in copper mine. In Effective and Sustainable Hydraulic Fracturing. INTECH, pp. 915–925.

Summary of Outreach Programmes

1 Course Co-ordinator

1.a Course Co-ordinator (Academic) for BE(ME) : Period 2014-2018
1.b Faculty Advisor : Period 2014-2018

2 Delivery of Short Term Courses

2.a Completed : 06

2.b Ongoing : NIL

3 Delivery of Invited Lectures in IIT(ISM) / elsewhere

3.a In IIT(ISM) : 28

3.b Elsewhere : 07

Details of the Delivery of Short Term Courses

Sl. No.	FY	Name of CI	Name of Co-CI	Name of Member	Name of sponsoring authority	Topic/Field
1	15-16	Prof. Phalguni Sen	Prof. R K Sinha		Subsidiary of CIL	1- Week Course on 'Surface Mining' (18th - 22nd Dec 2015) for practicing Mining Engineers
2	15-16	Prof. Phalguni Sen	Prof V K Singh Prof. R K Sinha		Sandvik	Off-Campus Training for Executives of Sandvik at Bengaluru (18-19 Jan, 2016)
3	17-18	Prof. R K Sinha	-		SAIL	Strata control in Underground coal mines, July 17-19, 2017 at premises of SAIL
4	18-19	Prof. V M S R Murthy	Prof. G Budi Shri K Pal		HZL	24 week Intensive Course on Rock Mechanics in Hard Rock Mining for HZL, Vedanta (03.09.20218 to

Sl. No.	FY	Name of CI	Name of Co-CI	Name of Member	Name of sponsoring authority	Topic/Field
			Prof. A S Venkatesh Prof. H Kumar Prof. R K Sinha Prof. Rakesh Kumar			23.11.2018) 12 weeks for Module I and (07.01.2019 29.03.2019) 12 weeks for Module II
5	18-19	Prof. S S Rai	Prof. R K Sinha	Prof. V M S R Murthy	RVUNL	3-Days Professional Development Program on "Surface Mining Best Practices" for the Executives of RVUNL
6	19-20	Prof. R K Sinha	Prof. B S Choudhary		TATA Steel	Professional Development Programme on Management and Advances in Underground and Surface Mining Technology (for the executives of Tata Steel)

Details of the Delivery of Invited Lectures in IIT(ISM) / Elsewhere

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
1	Invited Lecture in PDP on "Advanced practices for geo-engineering challenges for Hydro Power Project Development" during 23-25 October, 2024. Topic: HYDRAULIC FRACTURING FOR IN SITU STRESS MEASUREMENT AND ITS APPLICATIONS IN THE DESIGN OF UNDERGROUND STRUCTURES IN ROCK – FEW CASE STUDIES	IIT(ISM)	IIT(ISM), Dhanbad on 24.10.24 9.00 – 10.30 AM
2	Invited Lecture in PDP on "Design of Tunnels and Caverns for Hydro Power Projects"	IIT(ISM)	IIT(ISM), Dhanbad on

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
	from September 18, 2023, to September 22, 2023. Topic: Measurement of in-situ stress and numerical analysis of caverns		21.09.23 9.00 – 10.30 AM
3	Invited Lecture in PDP on “ROCK MECHANICS IN HARD ROCK MINING for the executives of HZL to be held during December 02, 2019 to December 28, 2019.” Topic: Empirical methods for estimating rock mass deformation modulus	IIT(ISM)	IIT(ISM), Dhanbad on 25.12.19 (WED) 9.00 – 10.30 AM
4	Invited Lecture in PDP on “ROCK MECHANICS IN HARD ROCK MINING for the executives of HZL to be held during December 02, 2019 to December 28, 2019.” Topic: Deformability of Rock Mass Using Plate Jacking Tests and Comparison	IIT(ISM)	IIT(ISM), Dhanbad on 26.12.19 (THU) 2.15 – 3.45 PM
5	Invited Lecture in PDP on “ROCK MECHANICS IN HARD ROCK MINING for the executives of HZL to be held during December 02, 2019 to December 28, 2019.” Topic: Numerical modeling and mine design applications in hard rock mining- Lab practical	IIT(ISM)	IIT(ISM), Dhanbad on 25.12.19 (WED) 2.15 – 5.30 PM
6	Invited Lecture in PDP on “ROCK MECHANICS IN HARD ROCK MINING for the executives of HZL to be held during December 02, 2019 to December 28, 2019.” Topic: In-situ Stress determination methods: Hydro-fracturing & Overcoring methods	IIT(ISM)	IIT(ISM), Dhanbad on 20.12.19 (FRI) 10.45 – 12.15 PM
7	Invited Lecture in PDP on “ROCK MECHANICS IN HARD ROCK MINING for the executives of HZL to be held during December 02, 2019 to December 28, 2019.” Topic: Preparation of structural model as a geotechnical tool in mine design for hard rock mining	IIT(ISM)	IIT(ISM), Dhanbad on 11.12.19 (WED) 9.00 – 10.30 AM
8	Invited Lecture in PDP on “ROCK MECHANICS IN HARD ROCK MINING for the executives of HZL to be held during December 02, 2019 to December 28, 2019.”	IIT(ISM)	IIT(ISM), Dhanbad on 10.12.19 (TUE)

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
	Topic: Basic concepts of geotechnical mapping in mine design for hard rock mining		9.00 – 10.30 AM
9	Invited Lecture in PDP on “Mine Training Programme for the Executives of Apollo tyres Ltd.” Topic: Design of haul road in surface mines for dump trucks	IIT(ISM)	IIT(ISM), Dhanbad on 23.09.19 (Mon) 11.15 am – 12.45 pm
10	Invited Lecture in the “Professional development programme on Management and Advances in Underground and surface Mining Technology (For the Executives of Tata Steel) from 19th - 31st Aug 2019” Topic: Design of haul roads and drainage in surface mines	IIT(ISM)	IIT(ISM), Dhanbad on Sat 24 th Aug, 19 From 2:15-3:45 PM
11	Invited Lecture in the “Professional development programme on Management and Advances in Underground and surface Mining Technology (For the Executives of Tata Steel) from 19th - 31st Aug 2019” Topic: Geological and geotechnical site characterization, geotechnical data collection and analysis	IIT(ISM)	IIT(ISM), Dhanbad on Tue 20 Aug, 19 from 9:00-10:30 AM & 10:45 AM-12:15PM
12	Invited Lecture in PDP on “Advanced Geological Technology for the Executives of Tata Steel from 1-13July, 2019.” Topic: Concepts of underground mining in metals with reference to chromite for steep and friable ore bodies	IIT(ISM)	IIT(ISM), Dhanbad on 03.07.2019 10.45 am – 12.15 pm
13	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for the Executives of HZL duting 7th Jan 2019 to 29th Mar 2019” Title: Principles of rock breakage using cutting tools and their applications in hard rock mines	IIT(ISM)	IIT(ISM), Dhanbad on 18.02.2019 from 9:00 Hrs to 10:00 Hrs
14	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for the Executives	IIT(ISM)	IIT(ISM), Dhanbad on

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
	of HZL duting 7th Jan 2019 to 29th Mar 2019” Title: Performance assessment of rock cutting by picks, disc and roller-cutters		15.02.2019 from 14:15 Hrs to 15:45 Hrs
15	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for the Executives of HZL duting 7th Jan 2019 to 29th Mar 2019” Title: Support requirement under different conditions- influencing parameters, selection and estimation	IIT(ISM)	IIT(ISM), Dhanbad on 14.02.2019 from 14:15 Hrs to 15:45 Hrs
16	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for the Executives of HZL duting 7th Jan 2019 to 29th Mar 2019” Title: Design of stopes using numerical modelling software (FDM)	IIT(ISM)	IIT(ISM), Dhanbad on 08.02.2019 from 14:15 Hrs to 15:45 Hrs
17	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for the Executives of HZL duting 7th Jan 2019 to 29th Mar 2019” Title: Analysis of underground excavations in jointed rockmass using numerical modelling software	IIT(ISM)	28.01.19 (MON) 2.15 – 3.45 PM 4.00 - 5.30 PM
18	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: In-situ stress determination methods: Hydro fracturing and over coring methods	IIT(ISM)	IIT(ISM), Dhanbad on 15.10.18 from 9:00 Hrs to 10:30 Hrs
19	Invited Tutorial in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: Geotechnical mapping in mine design for hard rock mining	IIT(ISM)	IIT(ISM), Dhanbad on 10.10.18 from 09:00 Hrs to 10:30 Hrs
20	Invited Tutorial in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: Geotechnical mapping in mine design for hard rock mining	IIT(ISM)	IIT(ISM), Dhanbad on 09.10.18 from16:00 Hrs to 17:30 Hrs

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
21	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: Preparation of structural model as a geotechnical tool in mine design for hard rock mining	IIT(ISM)	IIT(ISM), Dhanbad on 04.10.18 from 9:00 Hrs to 10:30 Hrs
22	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: Basic concepts of geotechnical mapping in mine design for hard rock mining	IIT(ISM)	IIT(ISM), Dhanbad on 02.10.18 from 14:15 Hrs to 15:45 Hrs
23	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: “Testing of creep behaviour: Laboratory uniaxial and triaxial creep tests, field tests and back analysis”	IIT(ISM)	IIT(ISM), Dhanbad on 27.09.2018 from 9:00 Hrs to 10:30 Hrs
24	Invited Lecture in the PDP on “SURFACE MINING BEST PRACTICES FOR COAL MINES (For the Executives of Rajasthan Vidyut Utpadan Nigam (RVUN)) 19th Sept to 21st Sept 2018” Topic: Equipment Selection in Surface Mining		20.09.2018 (THU) from 10:45 AM- 12:15 PM
25	Invited Lecture in the PDP on “Rock Mechanics in Hard Rock Mining for Executives of HZL” During 3rd Sept-23rd Nov 2018 Title: “Exploration drilling, recovery of samples, core logging, organisation and reporting of site investigations”	IIT(ISM)	IIT(ISM), Dhanbad on 11.09.2018 from 16 Hrs to 17:30 Hrs
26	Invited Lecture in the PDP on “Advanced surface mining practices for iron ore mines during 14 to 19 May 2018 for NMDC executives” Title: Selection of Surface Mining Equipment	IIT(ISM)	IIT(ISM), Dhanbad on 14.05.2018 from 4.00PM to 5.30 PM.

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
27	Invited Lecture in PDP on “Surface mining practices for iron ore mines during 14-19th May 2018 for executives of NMDC” Topic: Selection of surface mining equipment	IIT(ISM)	IIT(ISM), Dhanbad on 14.05.2018 4.00 – 5.30 pm
28	Invited Lecture in the PDP on “Strata Control in Underground Coal Mines” for the Executives of SAIL on July 17– 19, 2017 at VTC Chasnalla” Topic: Pre-mining state of stress and it’s influence on design of layouts for improved strata control	Chasnalla	Chasnalla on 19.07.2017 from 9:00 AM to 10:30 AM
29	Invited Lecture in the PDP on “Strata Control in Underground Coal Mines” for the Executives of SAIL on July 17– 19, 2017 at VTC Chasnalla” Topic:Support design in bord and pillar workings for effective strata control	Chasnalla	Chasnalla on 19.07.2017 from 1:45 PM to 3:15 PM
30	Invited Lecture in the PDP on “Strata Control in Underground Coal Mines” for the Executives of SAIL on July 17– 19, 2017 at VTC Chasnalla” Topic: Instrumentation for Strata monitoring	Chasnalla	Chasnalla on 18.07.2017 from 1:45 PM to 3:15 PM
31	Invited Lecture in the PDP on “Strata Control in Underground Coal Mines” for the Executives of SAIL on July 17– 19, 2017 at VTC Chasnalla” Topic: Subsidence mechanics and it’s prediction, Layouts for partial extraction to control subsidence	Chasnalla	Chasnalla on 18.07.2017 from 3:30 PM to5:00 PM
32	Invited Lecture in the “Off Campus Programme on Surface Mining 18th & 19th January, 2016 for the Executives of Sandvik at Bangalore” Title: Slopes in Surface Mines	Bangalore	Hotel “The Park Bangalore” on 19.01.2016 from 10:00 AM to 11:30 PM

Sl. No.	Course/Seminar	Institution/ Organisation	Place/Date
33	Invited Lecture in the “Off Campus Programme on Surface Mining 18th & 19th January, 2016 for the Executives of Sandvik at Bangalore” Title: Reclamation and Closure for Surface Mines	Bangalore	Hotel “The Park Bangalore” on 19.01.2016 from 11:45 AM to 1:15 PM
34	Invited Lecture in the “Off Campus Programme on Surface Mining 18th & 19th January, 2016 for the Executives of Sandvik at Bangalore” Title:Advances in Surface Mine Drilling and Blasting	Bangalore	Hotel “The Park Bangalore” on 18.01.2016 from 11:45 AM to 1:15 PM
35	Invited Lecture in “Professional Development Programme on Surface Mining (18 th – 22 nd December, 2015)” Topic: Slopes in Surface Mines	IIT(ISM)	IIT(ISM), Dhanbad on 15.12.2015 from 16 Hrs to 17:30 Hrs

Annexure-D

Summary of Ph.D. Supervision

1. **Number of PhDs Supervised/Awarded**
   a. **Principal Guide** [in IIT(ISM) along with external experts] : 11
   b. **Co-guide** [along with IIT(ISM) Faculty] : 01
2. **Number of PhDs Supervising**
   a. **Principal Guide** [in IIT(ISM) along with external experts] : 10 [Two on the verge of verge of Defense]
   b. **Co-guide** [along with IIT(ISM) Faculty] : 00

Details of Ph.D. Under Supervision

Sl. No.	Name of Candidate	Organisation	Topic	Guide	Co-Guide	External Guide	External Co-Guide	Status /Years of Regn
1	Mr. Sahil Sardana	Full time JRF	Geomechanical Investigations and Stability Assessment of Rock Slopes Under Normal and Freeze-Thaw Environment in Indian Himalayan Region	**Prof. R K Sinha**		Prof. A K Verma	Prof. T N Singh	Awarded on 23.Jul.2021
2	Mr. Arka Jyoti Das	CSIR-CIMFR	Investigation of failure mechanism and strength estimation of inclined coal pillars	Dr. P S Paul	**Prof. R K Sinha**	Dr. P K Mandal		Awarded on 25.Jan.2022
3	Mr. Pritam Biswas	CMPDI Bhubaneshwar	Development of a model for the determination of optimum cut-off grade for metalliferous deposits under various limiting conditions using dynamic programming	**Prof. R K Sinha**		Prof. Phalguni Sen		Awarded on 25.Aug.2022

Sl. No.	Name of Candidate	Organisation	Topic	Guide	Co-Guide	External Guide	External Co-Guide	Status /Years of Regn
4	Mr. S S Rajpurohit	Full time JRF	Influence of rock properties on sawability of dimension stones	**Prof. R K Sinha**		Prof. Phalguni Sen		Awarded on 25.Aug.2022
5	Mr S S Prasad	DGMS	Investigation into the geo-mechanical characteristics of coal measures for development of support guidelines in continuous miner workings	**Prof. R K Sinha**	Prof. R M Bhattacharjee	Dr. A K Sinha		Awarded on 25.Nov.2022
6	Ms. Mamta Jaswal	Full time JRF	Influence of water flow behaviour on the stability of dump slopes in surface mines	**Prof. R K Sinha**		Prof. Phalguni Sen		Awarded on 06.Dec.2022
7	Mr. Subrata Samanta	BCCL	Investigation into the stability of ribs and snooks in continuous miner panels	**Prof. R K Sinha**	Prof. H Kumar			Awarded on 23.Dec.2022
8	Mr. R B Prajapati	BCCL	Prediction of caving in bord and pillar depillaring panels in indian coal mines	**Prof. R K Sinha**		Dr. A Kushwaha		Awarded on 23.Dec.2022
9	Mr. K Sudhakar	NIRM	Prediction of rock mass behaviour and selection of proper instrumentation ranges	**Prof. R K Sinha**		Dr. S R Naik		Submitted Report awaited
10	Mr. H Vijay Sekar Bellapu	NIRM	Estimation of rock mass deformation modulus around large underground caverns using numerical back analysis for the himalayan and deccan plateau regions	**Prof. R K Sinha**		Dr. S R Naik		Awarded on 14.05.24

Sl. No.	Name of Candidate	Organisation	Topic	Guide	Co-Guide	External Guide	External Co-Guide	Status /Years of Regn
11	Mr. Sikandar Kumar	Full time JRF	Investigation into the influence of hydraulic sand stowing on stability of rib pillars and design of barrier pillars in bord and pillar Depillaring workings at deeper horizon	**Prof. R K Sinha**	Prof. M Jawed			Submitted Report awaited
12	Mr. P Guru Raju	AFCONS	Assessment of chemical additives on engineering behaviour of haul road material	**Prof. R K Sinha**		Prof. A K Verma		Awarded on 30.Dec.2024
13	Mr. Biniam Jobrie Teshome	Full time JRF	Subsidence Engineering	**Prof. R K Sinha**				1.43 yrs
14	Mr. Bhanu Kumar	Bosch Rexroth	IoT in Mining	**Prof. R K Sinha**				1.04 yrs
15	Mr. Atul Gandhe	JMS Mining	Underground Coal Mining and Strata Control	**Prof. R K Sinha**				1.01 yrs
16	Mr. Mukesh Kumar Sinha	DGMS	Slope Stability	**Prof. R K Sinha**		Dr. S S Prasad		1.01 yrs
17	Mr. Niraj Kumar	DGMS	Slope Stability	**Prof. R K Sinha**		Dr. S S Prasad		0.78 yrs
18	Mr. Vishwas Kumar Shrivastwa	JMS Mining	Underground Coal Mining and Strata Control	**Prof. R K Sinha**				0.86 yrs
19	Mr. Raj Kishore Singh	ECL	AI & ML in Production Planning	**Prof. R K Sinha**				0.63 yrs
20	Mr. Sunil Singh Yadav	JMS Mining	Underground Coal Mining and Strata Control	**Prof. R K Sinha**				0.07 yrs