Dr. RAHUL BHARTIYA

Assistant Professor,
Indian Institute of Technology (ISM) Dhanbad,
Dhanbad - 826004, Jharkhand, India
Email: rahulb@iitism.ac.in
Ph: +91 32622 35492 (O) +91 88009 59269 (M)



EDUCATION

Indian Institute of Technology Delhi
Ph.D., Structural Engineering
Thesis: Prediction of confinement behaviour of concrete-filled tubular columns under monotonic and cyclic axial loading

Indian Institute of Technology Bombay
B.Tech (Civil) + M.Tech (Structural Engineering)
Pursued as a dual-degree programme
Thesis: Fatigue analysis of concrete structures

RESEARCH AREAS/INTERESTS

- Concrete Confinement Models
- Concrete-filled Steel Tubular Columns
- Numerical modelling
- GFRP Reinforced Concrete
- Seismic Strengthening
- Fire Behaviour of Steel–Concrete Composites

PUBLICATIONS

Patent:

1. **Bhartiya, R.,** and Hassan, A. (2025). "A method of constructing advanced rotated multi-cellular double skin tube columns (RMCDSTCs) for enhanced structural performance." Indian Patent Application Publication No. 202531071018 A, published on August 1, 2025.

Book Chapter:

2. Sahoo, D. R., and **Bhartiya, R.** (2024). "Cyclic stress–strain model for circular concrete-filled steel tubular columns." *Lecture Notes in Civil Engineering*, *Springer Nature*, 511 LNCE, 113-120.

Peer-Reviewed Journals:

1. Ghate, N., **Bhartiya, R.**, and Adhikary, S. D. (2026). "Double-layered hybrid GFRP–steel reinforced concrete beams: flexural response, ductility, and failure modes." *Materials and Structu*res, https://doi.org/10.1617/s11527-026-03320-0
2. Rameshan, A. and **Bhartiya, R.** (2026). "Influence of slenderness, edge stiffeners, and built-up configuration on axial capacity of cold-formed steel columns." *Journal of*

Structural Design and Construction Practice, **in press**. https://doi.org/10.1061/JSDCCC/SCENG-2400

3. Choudhary, N., Gupta, T., Dwivedi, A., Samal, B. B., Roy, P., **Bhartiya, R.**, and Bhattacharya, B. (2026). "Peridynamics modeling and experimental investigation of wave isolation in shells and mechanical metasurfaces." *Thin-Walled Structures*, 114850
4. Hassan, A., Dar, M. A., **Bhartiya, R.**, and Bhat, J. A. (2026). "Modified concrete confinement model for multi-cell double-skin tubular columns." *Journal of Structural Design and Construction Practice*, https://doi.org/10.1061/JSDCCC/SCENG-2225
5. Sharma, K., **Bhartiya, R.**, and Das, S. K., (2026). "Sustainable mortars using overburden-derived M-sand and coal bottom ash: Mechanical properties, durability and life cycle assessment." *Construction and Building Materials*, 506, 144937.
6. Hassan, A., and **Bhartiya, R.** (2025). "Multi-cell double-skin tubular columns with rotated inner tube: axial design and testing." *Journal of Constructional Steel Research*, 236, 110060.
7. Hassan, A., **Bhartiya, R.**, and Ranjan, A. (2025). "Experimental evaluation and design recommendations for stiffener placement in square double-skin tubular columns." *Mechanics of Advanced Materials and Structures*, 2570523
8. Mallikarjuna, A., Yadav, D., **Bhartiya, R.**, Oinam, R. M., and Sahoo, D. R., (2025). "Seismic retrofitting of existing non-ductile open-ground story RC frames by partial infilling with RC shear walls: Experimental study." *Engineering Structures*, 335(7), 120397.
9. Sahu, S., Sahoo, D. R., and **Bhartiya, R.** (2025). "Lateral cyclic performance of shear-critical concrete beams reinforced with high-strength steel stirrups." *Structures*, 73(3), 108380.
10. **Bhartiya, R.**, Sahoo, D. R., and Oinam, R. M. (2023). "Cyclic axial stress-strain model for circular CFST columns under compression loading." *Soil Dynamics and Earthquake Engineering*, 164, 107588.
11. **Bhartiya, R.**, and Sahoo, D. R. (2021). "Prediction of axial compression behavior of rectangular RCFST columns with confining ties." *Journal of Constructional Steel Research*, 186, 106920.
12. **Bhartiya, R.**, Oinam, R. M., Sahoo, D. R., and Utkarsh, K. (2021). "Modified confinement model for monotonic axial behavior of concrete-filled tubular columns." *Journal of Constructional Steel Research*, 180, 106570.
13. **Bhartiya, R.**, Sahoo, D. R., and Verma, A. (2021). "Modified damaged plasticity and variable confinement modelling of rectangular CFT columns." *Journal of Constructional Steel Research*, 176, 106426.

Conference Proceedings:

1. Pawar, N., and **Bhartiya, R.** (2026). "SRC–RC Hybrid Frames: Selective Column Replacement for Seismic Resilience." *12th International Conference on the Behaviour of Steel Structures in Seismic Areas (STESSA)*, IIT Delhi, India

2. Choudhary, N., Gupta, T., Dwivedi, A., Samal, B. B., Roy, P., **Bhartiya, R.**, and Bhattacharya, B. (2026). "Peridynamics Shell Theory with Damping: Application to Wave Isolation in Mechanical Metasurfaces." *International Mechanical Engineering Congress & Exposition*, India, 3–5 September 2026 (Paper No. IMECE-India2026-188863)
3. Pawar, N., Maheshwari, R., and **Bhartiya, R.** (2025). "Enhancing Earthquake Resistance in Reinforced Concrete Structures using Steel-Concrete Composite Columns." *International Conference on Smart Resilient and Sustainable Infrastructure (SRISTI)*, IIT (ISM) Dhanbad, India
4. Pawar, N., Maheshwari, R., and **Bhartiya, R.** (2025). "Innovative use of Steel-Concrete Composite Columns for Earthquake-Resistant Open-Ground Story RCC Buildings." *International Conference on Smart Resilient and Sustainable Infrastructure (SRISTI)*, IIT (ISM) Dhanbad, India
5. Ranjan, A., **Bhartiya, R.** and Hassan, A. (2025). "Post-fire Behavior of Concrete-filled Steel Tubular Columns." *International Conference on Smart Resilient and Sustainable Infrastructure (SRISTI)*, IIT (ISM) Dhanbad, India
6. Sahoo, D. R. and **Bhartiya, R.** (2023). "Cyclic stress-strain model for circular concrete-filled steel tubular columns." *Second International Conference on Advances in Civil Infrastructure and Construction Materials (CICM 2023)*, Dhaka, Bangladesh
7. Abhilash, M., **Bhartiya, R.**, Oinam, R., and Sahoo, D. R. (2022). "Comparative study on mitigation of soft storey effects by FRP wrapping and addition of shear-walls." *Proc., Socio-Technological Aspects of Seismic Disaster and its Mitigation (STASDM),* IIT Guwahati, India
8. **Bhartiya, R.**, Sahoo, D. R., and Oinam, R. (2020). "Influence of length-to-depth ratio on monotonic compression behaviour of concrete-filled tubular columns." *Proc., fib Symp. 2020: Concrete Structures for Resilient Society*, Shanghai, China, 392–398.

SPONSORED RESEARCH PROJECTS

1. **Design of Mechanical Metasurfaces for Wave Isolation Applications by Developing a Large Deformation Peridynamics Shell Model** | **Role:** Co-PI | **Sponsoring Agency:** Aeronautics Research and Development Board (AR&DB), DRDO, India | **Status:** Ongoing (2025–2028)
2. **Design of Multi-stable Variable Stiffness Composite Shells for Morphing Applications** | **Role:** Co-PI | **Sponsoring Agency:** Aeronautics Research and Development Board (AR&DB), DRDO, India | **Status:** Ongoing (2023–2026)
3. **Behaviour of Steel-Concrete Composite under Fire Loading** | **Role:** PI | **Sponsoring Agency:** IIT (ISM) Dhanbad (Faculty Research Scheme – Seed Grant), India | **Status:** Completed (2024–2025)
4. **Feasibility Study of M-Sand from Coal OB** | **Role:** Co-PI | **Sponsoring Agency:** Tata Steel, India | **Status:** Completed (2022–2023)

CONSULTANCY PROJECTS

1. **Structural Stability Assessment/Audit of Existing Hostel Building no. 1, 2, 3, 4 & 5 of NIT Durgapur, West Bengal** | **Role:** Co-PI | **Client:** CPWD, NIT Durgapur Division, Durgapur | **Status:** Completed
2. **Design Validation of Structural Pulley Frames, Drive Base Frames & Associated Civil Foundations of Downhill Conv. No. 28 & 29 Phase II** | **Role:** Co-PI | **Client:** Merit Technologies India Ltd., Chennai | **Status:** Completed
3. **Proof Checking for Design and Drawings of 23 MLD Sewerage Treatment Plant in Ramgarh Town, Jharkhand** | **Role:** Co-PI | **Client:** M/s Enviro Infra Engineers Ltd., Ramgarh | **Status:** Completed
4. **Proof Checking for Design and Drawings of Networks Pipeline and Interception Diversion Inclusive of IPS for STP and I&D Project** | **Role:** Co-PI | **Client:** M/s Enviro Infra Engineers Ltd., Ramgarh | **Status:** Completed
5. **Proof checking for structural design and drawings of two buildings of NMDC 2 MTPA Pellet Plant at Nagarnar** | **Role:** PI | **Client:** M/s Engineering Design Research Centre, L&T Limited | **Status:** Completed
6. **Proof checking for design and drawings of Phase-1 of Medical College at Bihar** | **Role:** PI | **Client:** M/s Design Associates Inc, Noida | **Status:** Completed
7. **Design Validation of Newly Erected Structural Pulley Frames, Drive Base Frames & Associated Civil Foundations of Downhill Conv. No. 28 & 29** | **Role:** Co-PI | **Client:** N.M.D.C, Bacheli | **Status:** Completed
8. **Proof Checking for Design and Drawings of 17 MLD Sewerage Treatment Plant in Ramgarh Town, Jharkhand** | **Role:** Co-PI | **Client:** M/s Enviro Infra Engineers Ltd., Ramgarh | **Status:** Completed
9. **Vetting of Intake Arrangement Drawings at Rukka Dam, Ranchi, Jharkhand** | **Role:** Co-PI | **Client:** M/s Mata Rani Constructions Pvt. Ltd., Ranchi | **Status:** Completed
10. **Structural Safety Audit and Disability Audit of ESIC Hospital Building with Staff Quarters at Maithan, Dhanbad** | **Role:** Co-PI | **Client:** ESIC Regional Office, Ranchi | **Status:** Completed

OUTREACH ACTIVITIES

1. **Coordinated** a two-day workshop on "*Recent Advancements and Best Practices in Civil Engineering with Emphasis on Application of High-Strength Reinforcement Bars in Concrete Construction*", fully sponsored by **TATA TISCON**, as part of the institute's **Centenary Celebrations**, held on **3rd–4th January 2025**
2. **Co-coordinated** a two-day workshop on "*Advances in Application of High-Strength Reinforcement Bars in Construction of Concrete Structures*", fully sponsored by **TATA TISCON**, as part of the institute's **Centenary Celebrations**, held on **13th-14th November 2025**

ADMINISTRATIVE ACTIVITIES

At the Institute Level

- Professor-in-charge Infrastructure (Civil), IIT (ISM) Dhanbad, July 2025-present
- Faculty-in-charge Infrastructure (Civil), IIT (ISM) Dhanbad, Oct 2023-June 2025
- Coordinator Infrastructure (Civil), IIT (ISM) Dhanbad, Sep 2022-Oct 2023
- Institute Representative, JEE Advanced 2024
- Committee member for Empanelment of Architects for Comprehensive Consultancy for Various Upcoming Projects for IIT (ISM) Dhanbad, Oct 2024-present
- Committee member for RFP for Third Party Quality Assurance for Various Projects of IIT (ISM) Dhanbad, Oct 2024-present
- Committee member for Drawings and technical recommendation committee for various projects of IIT (ISM), Dhanbad deposited to CPWD, Sep 2025-present
- Committee member for Drawings and technical recommendation committee for various projects of IIT (ISM), Dhanbad deposited to WAPCOS Ltd., Sep 2024-present
- Member Invitee, Internal Works Committee, IIT (ISM) Dhanbad, Sep 2023 – present
- Reporting Centre Officer, Joint Seat Allocation Authority (JoSAA) 2023
- Reporting Centre Officer, Joint Seat Allocation Authority (JoSAA) 2022
- Physical Verification of Documents of 1st Year UG students admitted through JEE (Advanced) 2023
- Physical Verification of Documents of 1st Year UG students admitted through JEE (Advanced) 2022
- Member, Committee for Arrangements such as Decoration, Audio-Visual, Photography, etc. at Penman Auditorium, GJLT, Octonorm/Pandals, and also for the erection of Pandals for the organization of 4th Edition of the R&D Innovation Fair of Higher Educational Institutes of India, InvenTiv-2026 from 21–22 February, 2026
- Member DPAC for Erection of Pandal, Octonorm booth, Dome type structure, hangar type structure, carpeting, walling, TV screens etc.for the organization of 4th Edition of the R&D Innovation Fair of Higher Educational Institutes of India, InvenTiv-2026 from 21–22 February, 2026
- Member, Committee for Arrangements such as Decoration, Audio-Visual and Photography arrangement etc. at Penman Auditorium, NLHC, GJLT and Pandals and also for the erection of Pandals for the Centenary Carnival, covering Centenary Convocation, Foundation day, and Inter-IIT sports meet, from December 1-21, 2026
- Member, Committee for Arrangements such as Decoration, Audio-Visual and Photography arrangement etc. at Penman Auditorium, NLHC, GJLT and Pandals and also for the erection of Pandals for the 99th Foundation Day and 44th Convocation, 2024
- Member, Committee for Arrangements such as Decoration, Audio-Visual and Photography arrangement etc. at Penman Auditorium, NLHC, GJLT and Pandals and also for the erection of Pandals for the 98th Foundation Day and 43rd Convocation, 2023
- Member, Departmental Purchase Advisory Committee (DPAC), Office of Dean (Infrastructure), FY 2024-2025

- Member, Coordination Committee (constituted by DC, Dhanbad vide Letter No. 530, Dated: 16 October 2023) for Resolving the Water Accumulation Problem near Dhaiya Gate of IIT(ISM) Dhanbad
- Chairman, Sub-Committee for Webpage Development – Infrastructure Section (ECMU), IIT(ISM) Dhanbad

At the Department Level

- Member Department Committee for R&D Innovation Fair of Higher Educational Institutes of India, InvenTiv-2026 from 21–22 February, 2026
- Member, Department Undergraduate Committee (DUCG), 2022- 2024 and 2024-2026
- Member, Departmental Purchase Advisory Committee (DPAC), Civil Engineering, FY 2024-2025
- Member, Department Space Committee, Aug 2024- June 2026
- Coordinated the purchase of a multi-user network license of ABAQUS software
- Treasurer, Organising Committee of the International Conference on Smart Resilient and Sustainable Infrastructure (SRISTI), Jan 24–25, 2025, Organised by the Department of Civil Engineering, IIT (ISM) Dhanbad

INDUSTRIAL EXPERIENCE

WSP, Noida, India **2016 – 2019**

Designation: Principal Engineer

- **La Maison by HDS, Dubai:** a 105 stories tall skyscraper. Designed piled-raft foundation, composite columns, shear walls, out-rigger, and belt walls
- **Jumeirah Gate, Dubai:** consisted of 74 stories tall twin towers connected via a link bridge structure at the top. Was instrumental in the design of the steel link bridge
- **B4 Hotel, Dubai:** a 70 stories tall tower located adjacent to Burj Khalifa**.** Designed piled-raft foundation, columns, and shear walls

Royal HaskoningDHV, Noida, India **2015 – 2016**

Designation: Senior-I Engineer/Expert

- **Water treatment plant at Ravine Sable Sandpit, Port of Spain:** was lead in detailed (seismic resistant) design of various tanks, utilities, and auxiliary buildings as per Euro codes
- **New CDS Line, Brasco Pointe Noire Brewery Ltd., Congo:** worked on foundation design for the tender stage
- **Goa Shipyard phase-4, Goa:** worked on the concept design of various Steel and RCC structures, including a shipbuilding complex
- **Pulse TU Delft, The Netherlands:** designed pile foundation for the 4500 m^2 library building

GODREJ Properties Ltd., Gurgaon, India **2014 - 2015**

Designation: Manager - Structure

- **Godrej Summit, Godrej Oasis, Godrej Icon, Godrej Aria & Aravalli:** worked as a client structural engineer and led the structural design of group housing projects with a total built-up area of 4.5 million ft^2

M3M India Pvt. Ltd., Gurgaon, India **2013 - 2014**

Designation: Deputy Manager - Structure and Design

- **M3M Golf Estate, Gurgaon:** the project consists of a high-end group housing society, built over 75 acres of land with a built-up area of 4.2 million ft^2, with buildings ranging from 6 stories to 44 stories
- Worked as a client structural engineer and coordinated among structural consultants, peer reviewers, and contractors, and also performed the in-house design of auxiliary structures. Was successful in *value engineering* and saved around *1200 tons* of steel

AECOM India Pvt. Ltd., Noida, India **2012 - 2013**

Designation: Sr. Project Engineer

- **DLF Ultima Sec 81 and DLF Sky Court Sec 86, Gurgaon:** was instrumental in the peer review of residential buildings of the proposed group housing society having built-up areas of 3 and 1.7 million ft^2, respectively
- **3G Tower, Wave City Centre, Sec 32, Noida:** worked on the concept and schematic design of (3B+G+45) storied building
- After numerous iterations, carefully selected the structural arrangement and system to provide adequate safety, serviceability, and economy
- **Grand Hyatt Hotel, Sec 94 Noida**: worked on the concept and the schematic design of the Service Apartment and Hotel Tower, each consisting of (3B+G+45) and (3B+G+35) floors, respectively. Both the towers have a swimming pool on the terrace. The total built-up area of the project was about 1.8 million ft^2

Dar Al- Handasah, Pune, India **2008- 2012**

Designation: Structural Engineer

- **Security Buildings in Shamiyah Area (Makkah, KSA):** a 26 storied building over an emergency tunnel. Instrumental in the design of transfer girders above tunnel and 3.0 m thick transfer floor above podium.
- **Mianga Residential Building, Angola**: the project houses eight luxurious residential apartments and one VVIP Floor with a swimming pool on terrace on a plot of 767 m^2 and a total built-up area of 5369 m^2. Worked as a lead engineer and was able to complete the project successfully in a *tight schedule of 2 weeks*
- **National Assembly Building, Angola:** built-up area of 53,000 m^2. Value engineered the foundation, thereby **reducing** the substructure quantities by **40 %**

- **Princess Nora Bint University, Riyadh, Saudi Arabia:** the *World's Largest University of Women* (*LEED Certified*), area about 8 million m^2, was sent onsite to Dar's Beirut office for 3 months to work on academic buildings
- **King Abdullah Financial District, Riyadh:** reviewed parcel 2.05 designed by KPFF consultants, USA. It consists of mixed-use residential and commercial towers resting on 5 common podium floors. The total height above the ground was about 80 m
- **La Plage, The Pearl, Qatar:** built on 400 hectares of reclaimed land, and consisted of 12 residential buildings and 2 retail buildings. The total built-up area was about 250,000 m^2

OTHER ACHIEVEMENTS

- Received Excellent Teaching Feedback for "CEO301-Reliability and Risk Assessment" during the 2022–23 Monsoon Semester, acknowledged by the Director, IIT(ISM) Dhanbad
- Led the team of 15 engineers and 5 draughtsmen in WSP India and received the "Best team award" for the year 2017
- *LEED Accredited Professional* (U.S. Green Building Council) since March 2009
- Member, Indian Society of Earthquake Technology (ISET)