

Dr. RAHUL BHARTIYA

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EDUCATION

Indian Institute of Technology Delhi

Ph.D., Structural Engineering 2022
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) 2008
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

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. 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>
2. 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

3. 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*, **in press**.
<https://doi.org/10.1061/JSDCCC/SCENG-2225>
4. 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.
5. 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.
6. 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
7. 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.
8. 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.
9. **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.
10. **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.
11. **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.
12. **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., 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
2. 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

3. 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
4. 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
5. 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
6. **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 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 Dhainya 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-present
- 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 m² 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 ft²

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 ft², 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 ft², 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 ft²

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 m² and a total built-up area of 5369 m². 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 m². 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 m², 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 m²

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)