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**AREA(S) OF INTEREST**

Condition Assessment and Strengthening of Structures using FRP and UHPC Composites, FRP as Internal Reinforcement, Behaviour of Reinforced and Prestressed Concrete Members, Behaviour of Precast and Prefabricated Structures, Corrosion in RC and PSC members, Structural Analysis and Structural Dynamics.

Educational Qualifications	Year	Board/Institution	CGPA* / %
Ph. D: Structural Engineering	2024	Indian Institute of Technology, Hyderabad	9.41
M. Tech: Structural Dynamics	2016	Indian Institute of Technology, Roorkee	8.74
B. Tech: Civil Engineering	2014	Bapatla Engineering College (Affiliated to Acharya Nagarjuna University)	9.31
Diploma	2010	S.M.V.M. Polytechnic, Tanuku (Affiliated to SBTET, AP)	88.61

*CGPA on a scale of 10

AWARDS AND RESEARCH PROJECTS

2025 - 30	DST Inspire Faculty Fellowship for Investigating the Effectiveness of Innovative FRP-Based Strengthening Solutions for Corroded RC Elements in Bridges and Buildings.
2024 - 26	Development of Hybrid GFRP Dowels for Slab On-grade and Rigid Pavement Applications. Technology Development Grant. IIT Hyderabad. Co-PI.
2022 - 23	Received a Nidhi-Prayas (DST) Start-up Research Grant to Develop Multi-Laminate Prestressing Systems for Strengthening Bridges and Buildings.
2022	SPARC Fellowship to conduct the research work at TU Stuttgart, Germany as a visiting researcher.
2019	DUO – INDIA Fellowship at TU Stuttgart, Germany.

RESEARCH AND INDUSTRY EXPERIENCE

Indian Institute of Technology, Hyderabad Post-Doctoral Candidate & Project Scientist - II

(July 2024 – October 2025)

Conducted research on UHPC and FRP based strengthening systems for reinforced concrete elements, and examined the performance of hybrid GFRP-steel dowel systems. Responsibilities also included assisting the Principal Investigator in preparing competitive research proposals, along with active involvement in structural condition assessment studies and strengthening projects.

PhD Thesis: Size, Shape and Slenderness Effects on Behaviour of Hybrid FRP Strengthened RC Columns under Compression (2018 - 2024)

The research focused on evaluating how size, shape, and slenderness influence the effectiveness of a hybrid FRP strengthening technique for non-circular RC columns under compression. An innovative hybrid system combining externally bonded (EB) and near-surface mounted (NSM) FRP was developed to overcome the limitations of existing methods for large, high-aspect-ratio and slender columns. The study included testing of 84 RC columns with varying size, aspect, and slenderness ratios, along with nonlinear finite element analysis. A refined design-oriented confined concrete model incorporating size and shape effects was proposed based on experimental and analytical results.

WS Atkins (India) Pvt. Ltd. Assistant Engineer – Structures & Bridges

(2016-2018)

Prepared strengthening option reports for Langstone Bridge and Red Bridge in the UK, and carried out bridge assessments and designs following DMRB, British Standards, and Eurocodes. Worked on the Draycot Bridge deck replacement from initial concept to final delivery, including design, drawings, CDM documentation, BoQ, and specifications. Developed testing specifications, Approval in Principle documents, and design methods for various bridges under the Hampshire and Wiltshire framework contracts.

Indian Institute of Technology, Roorkee Seismic Assessment of Bridges on the Basis of IS-1893: Part-3

(2014-2016)

Carried out seismic assessment of pre-1970 bridges using pushover analysis as per IS 1893:1970 and IS 1893 (Part 3):2014. Compared seismic demands from both code versions with bridge capacities, identified seismic deficiencies, and designed suitable retrofitting solutions using RC jacketing and FRP strengthening.

NCC (Nagarjuna Construction Company Pvt. Ltd) Trainee Supervisor - Projects

(2010 - 2011)

Supervised execution of building works, including structural and finishing activities. Assisted in preparing Bar Bending Schedules, Bills of Quantities, and QA/QC reports.

SKILLS

Computer Languages	C
Software Packages	MIDAS, ANSYS, ABAQUS, LUSAS, AUTO-CAD, STAAD PRO, SAP-2000, ETABS and MAT LAB.
Academics	Secured overall 2nd rank in B. Tech., Civil Engineering. Secured overall 2nd rank in Diploma in Civil Engineering.
Additional Courses Taken	AUTO-CAD, Diploma in Computer Applications.
Languages Known	English (SRW), Hindi (SRW), Telugu (SRW)

PUBLICATIONS

SCI/Scopus Journal Publications

1. **Balla, T. M. R.,** Prakash, S. S. (2025) “Effect of Slenderness on Hybrid FRP Strengthened RC Columns under Eccentric Compression – An Experimental and Analytical Study”. *Journal of Composites for Construction*, 29(4), 04025024. DOI: [10.1061/JCCOF2.CCENG-5075](https://doi.org/10.1061/JCCOF2.CCENG-5075). Impact Factor: 3.9
2. **Balla, T. M. R.#,** Rahul Reddy, M.#, Prakash, S. S. (2025) “Enhancing Flexural Performance of Reinforced Concrete Beams using UHPC Overlay and External Bonding of CFRP Composites”. *Engineering Structures*, 330, 119951. DOI: [10.1016/j.engstruct.2025.119951](https://doi.org/10.1016/j.engstruct.2025.119951) #Equivalent first authors. Impact Factor: 6.4
3. Rahul Reddy, M.#, **Balla, T. M. R.#,** Prakash, S. S. (2025) “Behaviour of Reinforced Concrete Beams Shear Strengthened with Hybrid Combination of UHPC and CFRP Composites”. *Structures*, 74, 108498. DOI: [10.1016/j.istruc.2025.108498](https://doi.org/10.1016/j.istruc.2025.108498) #Equivalent first authors. Impact Factor: 4.3
4. **Balla, T. M. R.#,** Saharkar, S.#, Prakash, S. S., (2024). “Role of Fibre Addition in GFRP Reinforced Slender RC Columns under Eccentric Compression: An Experimental and Analytical Study”. *Journal of Composites for Construction*, 28(3), 04024010. DOI: [10.1061/JCCOF2.CCENG-4286](https://doi.org/10.1061/JCCOF2.CCENG-4286). #Equivalent first authors. Impact Factor: 3.9
5. **Balla, T. M. R.,** Prakash, S. S. (2024). “Cracking and Failure Mode Behaviour of Hybrid FRP Strengthened RC Column Members under Flexure Loading”. *Structural Concrete*, 25(3), 2164-2182. DOI: [10.1002/suco.202300789](https://doi.org/10.1002/suco.202300789). Impact Factor: 3.3
6. **Balla, T. M. R.,** Prakash, S. S., Rajagopal, A. (2023). “Role of size on the compression behaviour of hybrid FRP strengthened square RC columns–Experimental and finite element studies”. *Composite Structures*, 303, 116314. DOI: [10.1016/j.compstruct.2022.116314](https://doi.org/10.1016/j.compstruct.2022.116314). Impact Factor: 7.1
7. **Malleswara Rao, B. T.,** Prakash, S. S. (2021). “Shape effects on the behavior of hybrid FRP–strengthened rectangular RC columns under axial compression”. *Journal of Composites for Construction*, 25(5), 04021042. DOI: [10.1061/\(ASCE\)CC.1943-5614.0001152](https://doi.org/10.1061/(ASCE)CC.1943-5614.0001152). Impact Factor: 3.9
- **Balla, T. M. R.,** Prakash, S. S. “Experimental Investigation on the Effect of Slenderness on the Axial Compression-Bending Interaction Behaviour of Hybrid FRP Strengthened RC Columns”. (*Under Review- Journal of Composites for Construction*)
- **Balla, T. M. R.#,** Saharkar, S.#, Prakash, S. S. “Analytical Study on the Role of Fibres on Behaviour of GFRP Reinforced Slender RC Columns under Eccentric

Compression”. #Equivalent first authors. (*Under Review- Journal of Bridge Engineering*)

Design Patents (India)

1. **B. T. M. Rao**, M. R. Reddy, and S. S. Prakash. (2023). “Multi Laminate Prestressing Device”. *The Patent Office, Government of India*. Design No. 383016-001. 04-04-2023, Granted.
2. **B. T. M. Rao**, M. R. Reddy, and S. S. Prakash. (2023). “Prestress Jack Holding Device”. *The Patent Office, Government of India*. Design No. 383017-001. 04-04-2023, Granted.

Book Chapters & Conference Proceedings

1. **Rao, B. T. M.**, Morthala, R. R., Suriya Prakash, S. (2023). “Experimental Investigation on Flexural Behaviour of RC Beams Strengthened with Various FRP Composite Configurations”. *Fiber Reinforced Polymeric Materials and Sustainable Structures* (pp. 121-128). Singapore: Springer Nature Singapore. [10.1007/978-981-19-8979-7_9](https://doi.org/10.1007/978-981-19-8979-7_9)
2. **Rao, B. T. M.**, Morthala, R. R., Suriya Prakash, S. (2023). “Effectiveness of Hybrid FRP Strengthening on the Shear Behaviour of Reinforced Concrete Beams”. *11th International Conference on Fiber-Reinforced Polymer (FRP) Composites in Civil Engineering (CICE 2023)*. Rio de Janeiro, Brazil, 24-26 July 2023 DOI: [10.5281/zenodo.8155764](https://doi.org/10.5281/zenodo.8155764)
3. **Rao, B. T. M.**, Prakash, S. S. (2022). “Numerical Investigation on Size and Shape Effects on Hybrid FRP Strengthened Non-Circular RC Columns under Axial Compression”. *10th International Conference on FRP Composites in Civil Engineering: Proceedings of CICE 2020/2021 10* (pp. 1657-1669). Springer International Publishing. [10.1007/978-3-030-88166-5_144](https://doi.org/10.1007/978-3-030-88166-5_144)

International and National Conferences

1. **Rao, B. T. M.**, Saharkar, S., Suriya Prakash, S. (2024). “Behaviour of Slender Reinforced Concrete Columns with GFRP Bars and Discrete Fibres – An Analytical Study”. *10th International Conference on CONcrete under SEvere Conditions – Environment and Loading (CONSEC24)*, Chennai, India.
2. Morthala, R. R., **Rao, B. T. M.**, Suriya Prakash, S. (2024). “Shear Behaviour of RC Beams Strengthened with a Hybrid Combination Using FRP And UHPC”. *10th International Conference on CONcrete under SEvere Conditions – Environment and Loading (CONSEC24)*, Chennai, India.
3. **Rao, B. T. M.**, Suriya Prakash, S. (2023). “Effect of Slenderness on RC Columns Strengthened with Various FRP Configurations under Eccentric Compression”. *International Conference on Condition Assessment, Rehabilitation & Retrofitting of Structures (CARRS 2023)*, Department of Civil Engineering, IIT Hyderabad, 10-13 December 2023.
4. **Rao, B. T. M.**, Morthala, R. R., Suriya Prakash, S. (2022). “Flexural behaviour of RC beams strengthened using hybrid combination of CFRP laminates and UHPC overlay”. *6th International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICCRRR 2022)*, Cape Town, South Africa.

5. Morthala, R. R., **Rao, B. T. M.**, Suriya Prakash, S. (2022). “Flexural Behaviour of RC beams Strengthened with Hybrid CFRP laminates, U-Wrap Fabric and Anchorages”. *76th RILEM Annual Week and ICRCs 2022*, Kyoto, Japan.
6. **Rao, B. T. M.**, Chellapandian, M., Prakash, S. S. (2019). “Influence of Shape Effect on the Hybrid FRP Strengthened RC Columns under Axial Compression – A Finite Element Study”. *International Conference on Rehabilitation and Retrofitting of Structures (ICRRS 2019)*, Mumbai, India.
7. **Rao, B. T. M.**, Chellapandian, M., Prakash, S. S. (2019). “Efficiency of Hybrid FRP Strengthened RC Members under Combined Shear and Flexural Loading”. *International Conference on Rehabilitation and Retrofitting of Structures (ICRRS 2019)*, Mumbai, India.