

BONISHA BORAH



PERSONAL DATA

Affiliation: Department of Civil Engineering,
Royal School of Engineering & Technology (REST),
The Assam Royal Global University, Guwahati-781035, Assam, India

Nationality: Indian

Email: bborah2@rgu.ac

Personal Website: <https://sites.google.com/view/bonishaborah/home>

EDUCATION

July 2015-April 2022: **Doctor of Philosophy (PhD)** in Civil Engineering, Specialization: **Structural Engineering**, Indian Institute of Technology (IIT) Guwahati, Thesis: “Seismic Analysis and Design of Confined Masonry Buildings”, Supervisors: Hemant B Kaushik, IIT Guwahati, Vaibhav Singhal, IIT Patna.

July 2010- June 2014: **Bachelor of Engineering (BE) in Civil Engineering**, Royal School of Engineering and Technology (RSET), Gauhati University, First class with honors, University rank 1.

May 2009: Higher Secondary School Certificate (HSSC) (in Science), Assam Higher Secondary Educational Council (AHSEC), First class.

May 2007: High School Leaving Certificate (HSLC), Board of Secondary Education, Assam (SEBA), First class with star marks.

COURSES UNDERTAKING

PG: Disaster Management.

UG: Construction Engineering and Management, Environmental Science, Engineering Geology, Engineering Geology Lab, Material Testing Lab.

KEY COURSES TAKEN

PhD: Structural Dynamics, Earthquake Engineering, Advanced Structural Design, Finite Element Methods, Analysis and Design of Bridges, Continuum Mechanics.

BE: Engineering Mechanics, Strength of Materials, Elements of Civil Engineering, Theory of Structures, Design of Structures, Concrete Technology, Earthquake Engineering, Construction Practice & Building Drawing, Construction Management, Geotechnical Engineering, Foundation Engineering, Design of Substructures, Disaster Management.

WORK EXPERIENCE

▪ TEACHING / COURSE DEVELOPMENT

1. May 2024 – Present: Working as an **Assistant Professor** in the Department of Civil Engineering, RSET, The Assam Royal Global University.
2. During Doctoral program: Provided teaching assistantship in the Department of Civil Engineering, IIT Guwahati for Undergraduate courses: Structural Analysis, and Graduate courses: Design of Masonry Structures, Structural Engineering Lab.
3. Assistantship in the development of E-Learning Courses - Structural Dynamics and Earthquake Engineering for Prof. Kaustubh Dasgupta, and Prof. Hemant B. Kaushik, IIT Guwahati, under *National Mission Project on Education through ICT: Developing suitable pedagogical methods for various classes, intellectual calibres and research in e-learning.*

▪ RESEARCH

4. Worked as a **JRF-GATE** in the Department of Civil Engineering, IIT Guwahati, for the projects:
 - a) December 2021 – April 2024 (2 years 4 months): *Evaluation of column-to-beam flexural capacity ratio for strong-column weak-beam design in RC buildings*, sponsored by Science and Engineering Research Board (SERB), Department of Science & Technology (DST), Government of India.
 - b) January 2021 – December 2021 (11 months): *Seismic strengthening of unreinforced masonry buildings using ferrocement bands*, sponsored by Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology, Government of India.
 - c) August 2014 – July 2015 (1 year): *Evaluation and enhancement of seismic capacity of Assam type wooden housing*, sponsored by Science and Engineering Research Board (SERB), DST, Government of India.
5. Assisted in the development of post-earthquake reconnaissance report *April 25, 2015 Nepal Earthquake and Aftershocks – Building Performance Part I: Building Type Overview, RC Frame with Masonry Infill, and Wood Frame* under Hemant B Kaushik, IIT Guwahati.
6. Assisted in the development of the project proposal: Singhal, V. (PI) *Seismic Design and Performance Verification of Confined Masonry walls for Medium-Rise Buildings*, sponsored by Science and Engineering Research Board (SERB), Government of India.

▪ CONSULTANCY/INDUSTRY

7. Provided assistantship to Prof. Hemant B Kaushik, IIT Guwahati in his consultancy projects:
 - a) *Structural safety assessment of buildings in Jorhat military station damaged due to 28 April 2021 Sonitpur, Assam earthquake* (2022). Agency: Garrison Engineer Jorhat, Assam, India.
 - b) *Construction of low-cost housing at Eco-Park, Amingaon, Guwahati for NF Railway: Feasibility study and structural design* (2021). Agency: North Frontier Railway, Maligaon, Guwahati, India.
 - c) *Assessment of structural stability of Indian oil AOD State office building at Noonmati, Guwahati after 28 April 2021 Sonitpur, Assam earthquake* (2021). Agency: DGM (Engineering) IndianOil-AOD State Office Noonmati, Guwahati, India.
 - d) *Structural audit of military hospital Binnaguri, Binnaguri, West Bengal* (2021). Agency: Garrison Engineer (North) Binnaguri, West Bengal, India.
8. Worked as an Intern under Simplex Infrastructures Limited, Kolkata and P.W.D. P.C.C. Division, Dispur, Ghy-6 for the project *Proposed New Assam State Legislative Assembly Building at Dispur, Assam* during bachelor program.

WORKSHOPS / SHORT COURSES – PARTICIPATED AND ORGANIZED

- Participated in one day workshop on “Seismic Safety of Masonry Structures” on 11 Nov 2023, organized by Earthquake Engineering Research Centre (EERC), IIT Hyderabad.
- Participated in the online training programme on “Early Recovery from M6.4 Assam Earthquake April 28, 2021” on 04 May 2021, organized by National Institute of Disaster Management (NIDM), Ministry of Home Affairs, Government of India in collaboration with Assam Engineering College (AEC) Guwahati and North Eastern Hill University (NEHU) Shillong, India.
- Participated in the webinar on “The Recent M6.4 Assam Earthquake and its Lessons” on 09 May 2021, organized by Department of Civil Engineering, Royal School of Engineering and Technology, Guwahati, India.
- Attended TEQIP-III one-week online faculty development program on “Disaster Management Mitigation and Responses, 2020” during 10–14 August 2020, organized by Department of Civil Engineering, AEC, Guwahati, India.
- Participated and helped in organizing the short-term course on “Recent Advances in Construction Materials and Building Technologies” during 26-31 December 2020, conducted by the Department of Civil Engineering and Centre for Educational Technology, IIT Guwahati, India under TEQIP sponsored by MHRD, Government of India.
- Attended TEQIP-III four days webinar on “Recent Trends in Structural and Environmental Engineering” during 8–11 July 2020, conducted by the Department of Civil Engineering, Girijananda Chowdhury Institute of Management and Technology (GIMT), Guwahati, India and organized by Assam Science and Technology University, Guwahati, India.
- Volunteered for TEQIP-III brainstorming session cum workshop on “Quantification of Seismic Hazard and Mitigation of Induced Effects in NE Region” during 8– 9 November 2019, organized by Department of Civil Engineering and Centre for Educational Technology, IIT Guwahati, India.
- Attended QIP short term course on “Impact and Blast Resistant Design of Structures,” in 2015 organized by Department of Civil Engineering, IIT Guwahati, India.
- Attended workshop on “Wind Disaster Problems – Challenges Ahead”, held during 21– 22 February 2013, organized jointly by Royal School of Engineering and Technology, Guwahati, India and Indian society of Wind Engineering, Roorkee, India.
- Volunteered for national conference on “Pure and Applied Mathematics” during 9–10 May 2013 organized by Royal School of Engineering and Technology, Guwahati, India.

AWARDS / FELLOWSHIPS

- **Best Paper Award 2020**
For the paper: Borah, B., Kaushik, H.B., and Singhal, V. (2020). “Finite Element Modelling of Confined Masonry Wall under In-plane Cyclic Load.”
By: International Conference on Materials, Mechanics and Structures 2020 (ICMMS2020).
- **MHRD – GATE Scholarship** in Doctor of Philosophy (from July 2015 to October 2020)
By: Department of Higher Education, Ministry of Human Resource Development (MHRD).
- **Merit Scholarship** for excellent academic performance in semesters of Bachelor of Technology (from first semester to eight semester, July 2010 to June 2014)
By: Royal School of Engineering and Technology (RSET), Guwahati.
- **Royal Merit Award 2014** for first position in Bachelor of Technology
By: Royal School of Engineering and Technology (RSET), Guwahati.
- **Best Project Award 2011** in the Mini-Project Exhibition
By: Royal School of Engineering and Technology (RSET), Guwahati.
- **Anundoram Borooh Award 2007** in HSLC. By: Government of Assam.

SKILLS

- Computer Programs and Editor: ABAQUS, SAP2000, ETABS, AutoCAD, MS Office.
- Languages: English, Hindi, and Assamese.

PROFESSIONAL MEMBERSHIPS

- Affiliate Member of Earthquake Engineering Research Institute (EERI) – 2024 to Present
- Affiliate Member of American Society of Civil Engineers (ASCE) – 2020 to Present
- Graduate Member of The Institution of Structural Engineers (IStructE) – 2020 to Present

PROFESSIONAL ACTIVITIES

- Reviewer of Journal of Structural Integrity and Maintenance, Taylor & Francis.
- Reviewer of Journal of Building Pathology and Rehabilitation, Springer.
- Reviewer of Insight - Civil Engineering.

RESEARCH INTERESTS

- Seismic Analysis and Design of Structures
- Nonlinear Behavior of Structures
- Numerical and Experimental Methods
- Retrofitting of Structures
- Vernacular Housing Systems

PUBLICATIONS

JOURNAL PUBLICATIONS

1. Borah, B., Gupta, A., Singhal, V., and Kaushik, H.B. (2024). “Design of Tie-Columns in Confined Masonry Structures for Lateral Loads.” *Earthquake Spectra*, EERI. <https://doi.org/10.1177/87552930241246148> (Q1, IF: 5.01, h5 index: 105)
2. Borah, B., Naik, S., Abhishek, V., Kaushik, H.B., and Singhal, V. (2024). “Influence of Wall Openings on Nonlinear Lateral Load Response of Reinforced Concrete Frames with Masonry Infills: A Finite Element Study.” *International Journal of Civil Engineering*, Springer, April 2024, 22(4), 619–637. <https://doi.org/10.1007/s40999-023-00922-5> (Q2, IF: 2.184, h5 index: 30)
3. Borah, B., Kaushik, H.B., and Singhal, V. (2023). “Analysis and Design of Confined Masonry Structures: Review and Future Research Directions.” *Buildings*, MDPI, May 2023, 13(5), 1282. <https://doi.org/10.3390/buildings13051282> (Q1, IF: 3.8, h5 index: 53)
4. Borah, B., Kaushik, H.B., and Singhal, V. (2023). “Evaluation of Modeling Strategies for Seismic Analysis of Confined Masonry Structures.” *Bulletin of Earthquake Engineering*, Springer, January 2023, 21(2), 1273–1301. <https://doi.org/10.1007/s10518-022-01578-7> (Q1, IF: 4.6, h5 index: 55)
5. Borah, B., Kaushik, H.B., and Singhal, V. (2022). “Seismic Force Distribution in Members of Confined Masonry Buildings.” *Engineering Structures*, Elsevier, September 2022, 266, 114605. <https://doi.org/10.1016/j.engstruct.2022.114605> (Q1, IF: 5.5, h5 index: 93)
6. Borah, B., Kaushik, H.B., and Singhal, V. (2022). “Lateral Load-Deformation Models for Seismic Analysis and Performance-Based Design of Confined Masonry Walls.” *Journal of Building Engineering*, Elsevier, May 2022, 48, 103978. <https://doi.org/10.1016/j.job.2021.103978> (Q1, IF: 6.4, h5 index: 88)

7. Borah, B., Singhal, V., and Kaushik, H.B. (2021). "Assessment of Seismic Design Provisions for Confined Masonry using Experimental and Numerical Approaches." *Engineering Structures*, Elsevier, October 2021, 245, 112864.
<https://doi.org/10.1016/j.engstruct.2021.112864> (Q1, IF: 5.5, h5 index: 93)
8. Borah, B., Kaushik, H.B., and Singhal, V. (2021). "Development of a Novel V-D Strut Model for Seismic Analysis of Confined Masonry Buildings." *Journal of Structural Engineering*, ASCE, March 2021, 147(3), 04021001.
[https://doi.org/10.1061/\(ASCE\)ST.1943-541X.0002941](https://doi.org/10.1061/(ASCE)ST.1943-541X.0002941) (Q1, IF: 4.1, h5 index: 53)
9. Borah, B., Singhal, V., and Kaushik, H.B. (2019). "Sustainable Housing using Confined Masonry Buildings." *SN Applied Sciences*, Springer, September 2019, 1(9), 983.
<https://doi.org/10.1007/s42452-019-1020-4> (Q2, IF: 2.6, h5 index: 65)

CONFERENCE PUBLICATIONS

1. Borah, B., Kaushik, H.B., and Singhal, V. (2024). "A Proposal for Seismic Analysis and Design of Confined Masonry Walls" *18th World Conference on Earthquake Engineering (18WCEE)*, under the theme: RES - Seismic Resilience of Communities and Infrastructure, 30 June-05 July 2024, Milan, Italy.
2. Borah, B., Kaushik, H.B., and Singhal, V. (2023). "Sensitivity of Seismic Force Distribution to Key Parameters of Confined Masonry Buildings" *13th Structural Engineering Convention (SEC-2023)*, under the theme: Masonry Structure, 07-09 December 2023, Visvesvaraya National Institute of Technology, Nagpur, India, paper id 159.
3. Borah, B., Kaushik, H.B., and Singhal, V. (2023). "Experimental Validation of a Design Methodology for the Tie-Columns of Confined Masonry Buildings" *14th North American Masonry Conference (14NAMC)*, 11-14 June 2023, Omaha, Nebraska, USA, pages 322-330.
4. Borah, B., Kaushik, H.B., and Singhal, V. (2022). "Application of V-D Strut Model for Analysis and Design of Multi-Story Confined Masonry Buildings." *2nd International Conference on Materials, Mechanics and Structures (ICMMS2022)*, 10-12 March 2022, National Institute of Technology Calicut, India, paper id CMS058.
5. Borah, B., Kaushik, H.B., and Singhal, V. (2020). "Effectiveness of Code Approaches in Seismic Design of Confined Masonry Walls" *17th World Conference on Earthquake Engineering (17WCEE)*, 13-18 September 2020, Sendai, Japan, International Association for Earthquake Engineering and Japan Association for Earthquake Engineering, paper id 2c-0268.
6. Borah, B., Kaushik, H.B., and Singhal, V. (2020). "Finite Element Modelling of Confined Masonry Wall under In-plane Cyclic Load." *International Conference on Materials, Mechanics and Structures 2020 (ICMMS2020)*, 14-15 July 2020, National Institute of Technology Calicut, India, pages 142-148, paper id CMS045. (**Best Paper Award**)
7. Borah, B., Singhal, V., and Kaushik, H.B. (2019). "Assessment of Important Parameters for Seismic Analysis and Design of Confined Masonry Buildings." *National Conference on Advances in Structural Technologies (CoAST2019)*, 1-3 Feb 2019, NIT Silchar, India, paper no. 138.
8. Borah, B., Singhal, V., and Kaushik, H.B. (2018). "A Simplified Approach to Analytical Modeling of Confined Masonry Buildings." *16th Symposium on Earthquake Engineering (16SEE)*, 20-22 Dec 2018, IIT Roorkee, India, paper no. 247.
9. Borah, B., Singhal, V., and Kaushik, H.B. (2018). "Sustainable Housing using Confined Masonry Buildings." *2nd International Conf on Civil Engineering for Sustainable Development- Opportunities & Challenges (CESDOC 2018)*, under the theme: Sustainable Rural Development (Sub-Theme: Affordable Housing), 18-19 Dec 2018, Assam Engineering College, Guwahati, India, pages 318-322, paper id SRD0103.

BOOK CHAPTERS

1. Borah, B., Singhal, V., and Kaushik, H.B. (2021). “Assessment of Important Parameters for Seismic Analysis and Design of Confined Masonry Buildings: A Review”, *Advances in Structural Technologies*, Lecture Notes in Civil Engineering (LNCE), Adhikari S., Dutta A., Choudhury S. (eds.), Springer, Singapore, vol 81, 261-275, ISBN: 978-981-15-5235-9 (online), 978-981-15-5234-2 (print). https://doi.org/10.1007/978-981-15-5235-9_20
2. Borah, B., Kaushik, H.B., and Singhal, V. (2020). “Finite Element Modelling of Confined Masonry Wall under In-plane Cyclic Load”, *IOP Conf. Series: Materials Science and Engineering*, IOP Publishing, vol 936, 012020, ISSN: 1757-899X (online), 1757-8981 (print). <https://doi.org/10.1088/1757-899X/936/1/012020>

TECHNICAL REPORTS

1. Kaushik, H.B., Borah, B., Sarma, S.K., and Mukherjee, A. (2022). Structural Safety Assessment of Buildings in Jorhat Military Station damaged due to 28 April 2021 Sonitpur, Assam Earthquake. Garrison Engineer Jorhat, India.
2. Kaushik, H.B., Borah, B., Sarma, S.K., and Mukherjee, A. (2021). Assessment of Structural Stability of Indian Oil AOD State Office Building at Noonmati, Guwahati after 28 April 2021 Sonitpur, Assam Earthquake. DGM (Engineering) IndianOil-AOD State Office Noonmati, Guwahati.
3. Kaushik, H.B., Borah, B., Sarma, S.K., and Mukherjee, A. (2021). Structural Audit of Military Hospital Binnaguri, Binnaguri, West Bengal. Garrison Engineer (North) Binnaguri. India.