

Sanket Nayak, PhD

Associate Professor, Dept. of Civil Engineering
Indian Institute of Technology (Indian School of Mines), Dhanbad
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D.O.B.: 3rd April, 1983.

Citizenship: Indian

Research Interest:

- Seismic Safety Assessment and Enhancement of Structures
- Mitigation Strategy for Impact Vulnerability of Structures
- Sustainable Strengthening Techniques
- Masonry Structures Vulnerability Assessment and Strengthening Strategy
- Structural Health Monitoring
- Structural Dynamics & Earthquake Engineering
- Sustainable Concrete

Educational Qualification:

- ✓ **B. Tech.** in Civil Engineering (KIIT University, Bhubaneswar)
- ✓ **M. Tech.** in Structural Engineering (Odisha University of Technology & Research, Bhubaneswar)
- ✓ **Ph.D.** in Structural Engineering (IIT Bhubaneswar)

Experience:

- **Associate Professor**, Department of Civil Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, since 13th April, 2022 to till date.
- **Assistant Professor**, Department of Civil Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, since 28th May, 2014 to 12th April, 2022.
- **Visiting Academic Researcher** during November, 2024, Department of Civil and Environmental Engineering, **Universitat Politècnica de Catalunya, Barcelona Tech - UPC.**
- **Visiting Academic Researcher** during October, 2016, Department of Civil and Environmental Engineering, **University of Surrey, UK.**
- **Visiting Faculty** during June, 2015, Department of Civil and Environmental Engineering, **University of Windsor, Canada.**
- **Assistant Professor**, School of Civil Engineering, KIIT University since 1st October, 2013 to 22nd May, 2014.

- **Research Scholar**, School of Infrastructure, IIT Bhubaneswar since 5th October, 2009 to 30th September, 2013.
- **Lecturer**, School of Civil Engineering, KIIT University since 30th August, 2007 to 1st October, 2009.

Courses Taught:

Under Graduate

- Structural Analysis
- Solid Mechanics
- Design of RC Structures
- Engineering Graphics (Drawing Lab.)
- Material Testing (Lab.)
- Structural Analysis (Lab.)

Post Graduate

- Structural Dynamics & Earthquake Engineering
- Earthquake Resistant Design of Structures
- Concrete Technology
- Finite Element Method
- Advanced Design of Structures
- Structural Engg. (Lab.)

Research Guidance:

- **Ph.D.**

A. Completed: 06

1. **Dr. Romio Mandal**, Awarded in the Year 2025.

Supervisors: Dr. Sanket Nayak and Prof. S K Panda, IIT Bhubaneswar.

2. **Dr. Manish Prabhakar Mokul**, Awarded in the Year 2024.

Supervisors: Dr. Sanket Nayak and Prof. S K Panda, IIT Bhubaneswar.

3. **Dr. Nikhil Ranjan**, Awarded in the Year 2024.

Supervisor: Dr. Sanket Nayak

4. **Dr. Sajal Sarkar**, Awarded in the Year 2023.

Supervisors: Dr. Sukanta Chakraborty and **Dr. Sanket Nayak**.

5. **Dr. Susanta Banerjee**, Awarded in the Year 2021.

Supervisors: Dr. Sanket Nayak and Prof. Sreekanta Das, University of Windsor, Canada.

6. **Dr. Puja Rajhans**, Awarded in the Year 2019.

Supervisors: Prof. S K Panda and **Dr. Sanket Nayak**.

B. Ongoing: 04

- **M. Tech.**

Completed: 16, Ongoing: 03

Awards and Achievements:

- **Associate Editor, Sadhana**, Springer Publication, from July 2025.

- Carried out collaborative research work during November 2024, as **Visiting Academic Researcher** in Department of Civil and Environmental Engineering, **Universitat Politècnica de Catalunya, Barcelona Tech – UPC**.
- Visited **Italy**, for presenting paper in 16th International Conference on Civil, Structural and Environmental Engineering held at **Riva del Garda, Italy** held during 16th – 19th September, 2019.
- **Member of the Scientific Committee of EUCEET 2018:** 4th International Conference on Civil Engineering Education held in **Barcelona, Spain**, from September 5th to 8th, 2018.
- Received **Institution of Engineers India (IEI) Young Engineers Award 2018-2019**, in Civil Engineering Discipline.
- Visited **University of Malaya, Kuala Lumpur, Malaysia** for presenting paper in **14th International Conference on Concrete and Technology (CONCET- 2018)** held during 8th to 9th August, 2018, funded through ITS from SERB (DST), Govt. of India.
- Carried out collaborative research work during October 2016, as **Visiting Academic Researcher** in Department of Civil and Environmental Engineering, **University of Surrey, UK**.
- Carried out collaborative research work during June 2015, as **Visiting Faculty** in Department of Civil and Environmental Engineering, **University of Windsor, Canada**.
- Developed **Biaxial Shake Table facility** at IIT (ISM), Dhanbad, which may be considered as **state-of-the-art** facility in the field of **Structural Dynamics and Earthquake Engineering**.
- Visited **Tokyo Institute of Technology, Tokyo, Japan** from 3rd to 9th March, 2012 for presenting paper in an International Conference. The visit was also enriched with technical interaction and state-of-the-art laboratory visit of many renowned Universities and Companies like **Yamaguchi University and Shimuzi Corporation, Tokyo, Japan**.
- Got the **MHRD fellowship** to pursue Ph.D. in School of Infrastructure at IIT Bhubaneswar in the year 2009.
- Bagged **TWO Gold Medal awards** (S.V. Srinivasan Memorial and Madhab Jena Memorial) by Institution of Engineers, India, Bhubaneswar chapter in the year 2009.

Publications:

Journals [50]

1. Junias, J., Ranjan, N., Mohapatra, S. S. and **Nayak, S. (2026)**, “Feasibility and mechanistic insights into various strengthening techniques for augmenting the flexural performance of masonry under fatigue loading”, **Journal of Performance of Constructed Facilities, ASCE**, **40(4): 04026021**, DOI: [10.1061/JPCFEV.CFENG-5165](https://doi.org/10.1061/JPCFEV.CFENG-5165).

2. Junias, J., Ranjan, N. and **Nayak, S. (2026)**, “Enhancing fatigue resilience of unreinforced masonry subjected to repeated cyclic loading: an experimental and probabilistic evaluation”, **European Journal of Environmental and Civil Engineering**, Taylor & Francis, 30 (1), 2604292, DOI: [10.1080/19648189.2025.2604292](https://doi.org/10.1080/19648189.2025.2604292).
3. Junias, J. and **Nayak, S. (2026)**, “Augmenting masonry impact resistance: Experimental investigation and statistical reliability assessment”, **Engineering Structures**, Elsevier, 348, 121821, DOI: [10.1016/j.engstruct.2025.121821](https://doi.org/10.1016/j.engstruct.2025.121821).
4. Mandal, R., Panda, S. K. and **Nayak, S. (2025)**, “Rheological characterisations of sulfate-resisting Portland cement concrete with different degrees of workability”, **Magazine of Concrete Research**, Emerald Publishing (ICE Publishing), 77 (23-24), 1337–1350, DOI: [10.1680/jmacr.25.00120](https://doi.org/10.1680/jmacr.25.00120).
5. Ranjan, N., Banerjee, S., **Nayak, S.**, Kodur, VKR, and Das, S. (2025), “Shaking table tests of one and two story masonry building models seismically augmented with plastic waste reinforced cementitious composite” **Structures**, Elsevier, 76, 109015, DOI: [10.1016/j.istruc.2025.109015](https://doi.org/10.1016/j.istruc.2025.109015).
6. Ranjan, N., **Nayak, S.** and Das, S. (2025), “Durability assessment of masonry specimens built with waste fibre added cementitious composite in acidic environment”, **European Journal of Environmental and Civil Engineering**, Taylor & Francis, 29 (10), 2157-2176, DOI: [10.1080/19648189.2025.2477073](https://doi.org/10.1080/19648189.2025.2477073).
7. Ranjan, N., **Nayak, S.**, Bhattacharya, S. and Das, S. (2025), “Seismic safety enhancement of 1:3 scaled-down two-story masonry buildings models built with agro and textile waste fibre-strengthened cementitious composites subjected to uni-directional shaking table test”, **Journal of Earthquake Engineering**, Taylor & Francis, 29(8), 1724-1752, DOI: [10.1080/13632469.2025.2475810](https://doi.org/10.1080/13632469.2025.2475810).
8. Junias, J., Ranjan, N. and **Nayak, S. (2025)**, “A systematic review of structural performance and failure trends of impact on low-rise masonry dwellings: Current trends and way forward” **Structures**, Elsevier, 71, 107988, DOI: [10.1016/j.istruc.2024.107988](https://doi.org/10.1016/j.istruc.2024.107988).
9. Mandal, R., Panda, S. K. and **Nayak, S. (2025)**, “Influence of two-stage mixing approach on thixotropic behavior of self-compacting recycled aggregate concrete”, **Journal of Materials in Civil Engineering**, ASCE, 37(3): 04025017, DOI: [10.1061/JMCEE7.MTENG-18447](https://doi.org/10.1061/JMCEE7.MTENG-18447).
10. Ranjan, N., Banerjee, S., **Nayak, S.** and Das, S. (2024), “Upgrading seismic safety of masonry building models built using recycled waste fiber-reinforced mortar through uni-axial shake table testing”, **Structures**, Elsevier, 65, 106624, DOI: [10.1016/j.istruc.2024.106624](https://doi.org/10.1016/j.istruc.2024.106624).
11. Tudu, C., Mohanty, M., Mohapatra, S. S. and **Nayak, S. (2024)** “A systematic review exploring the feasibility of waste plastic as different constituents towards sustainable concrete” **Construction and Building Materials**, Elsevier, 428, 136210, DOI: [10.1016/j.conbuildmat.2024.136210](https://doi.org/10.1016/j.conbuildmat.2024.136210).
12. Mandal, R., Panda, S. K. and **Nayak, S. (2024)**, “Evaluation of rheological properties of sustainable self-compacting recycled aggregate concrete produced by two-stage mixing approach”, **Journal of Building Engineering**, Elsevier, 87, 109126, DOI: [10.1016/j.jobbe.2024.109126](https://doi.org/10.1016/j.jobbe.2024.109126).

13. Ranjan, N., Banerjee, S., **Nayak, S.** and Das, S. (2024), "Seismic safety evaluation of coir and nylon fiber-reinforced masonry building models subjected to bi-axial shaking table test", **Journal of Building Engineering, Elsevier**, 85, 108767, DOI: [10.1016/j.jobbe.2024.108767](https://doi.org/10.1016/j.jobbe.2024.108767).
14. Sarkar, S., Chakraborty, S. and **Nayak, S.** (2024), "ANN-based axial strength prediction of short columns with double and bar-reinforced concrete-filled steel tubes subjected to concentric and eccentric loading", **Arabian Journal for Science and Engineering, Springer**, 49, 4947–4968, DOI: [10.1007/s13369-023-08285-8](https://doi.org/10.1007/s13369-023-08285-8).
15. Mokal, M. P., Mandal, R., **Nayak, S.** and Panda, S. K., (2023), "Efficacy of high-volume fly ash and slag on the physicomaterial, durability, and analytical characteristics of high-strength mass concrete", **Journal of Building Engineering, Elsevier**, 76, 107295, DOI: [10.1016/j.jobbe.2023.107295](https://doi.org/10.1016/j.jobbe.2023.107295).
16. Mokal, M. P., Mandal, R., **Nayak, S.** and Panda, S. K., (2023), "Impact of slag-fly ash cementitious system on thermal controls and durability of high-strength mass concrete", **Structural Concrete, Wiley**, 24(5), 6778-6797, DOI: [10.1002/suco.202300197](https://doi.org/10.1002/suco.202300197).
17. Mandal, R., Panda, S. K. and **Nayak, S.** (2023), "Rheology of concrete: critical review, recent advancements, and future perspectives", **Construction and Building Materials, Elsevier**, 392, 132007, DOI: [10.1016/j.conbuildmat.2023.132007](https://doi.org/10.1016/j.conbuildmat.2023.132007).
18. Ranjan, N., Banerjee, S., **Nayak, S.** and Das, S. (2023), "Exploring applicability of recycled nylon fiber reinforced mortar in joints and plaster to enhance the bond strength, in-plane and out-of-plane capacity of masonry structures", **Journal of Building Engineering, Elsevier**, 72, 106744, DOI: [10.1016/j.jobbe.2023.106744](https://doi.org/10.1016/j.jobbe.2023.106744).
19. Ranjan, N., Banerjee, S., **Nayak, S.** and Das, S. (2023), "Waste polyethylene terephthalate (PET) fiber reinforced mortar in enhancing the bond behavior of masonry", **Structures, Elsevier**, 53, 908-923, DOI: [10.1016/j.istruc.2023.04.097](https://doi.org/10.1016/j.istruc.2023.04.097).
20. Sarkar, S., Chakraborty, S. and **Nayak, S.** (2023), "Identification of optimum reinforcement detailing using tuned CDP parameters in RC beam under drop-weight impact", **Engineering Failure Analysis, Elsevier**, 146, 107116, DOI: [10.1016/j.engfailanal.2023.107116](https://doi.org/10.1016/j.engfailanal.2023.107116).
21. Ranjan, N., Banerjee, S., **Nayak, S.** and Das, S. (2023), "Agro-waste fiber reinforced mortar for augmenting the performance of masonry structures", **Construction and Building Materials, Elsevier**, 363, 129848, DOI: [10.1016/j.conbuildmat.2022.129848](https://doi.org/10.1016/j.conbuildmat.2022.129848).
22. Mandal, R., Panda, S. K., Kisku, N., Rajhans, P., Banerjee, S. and **Nayak, S.** (2023), "Improvement of shear capacity of RAC beams by adopting identical mortar volume method of mix-design along with dual-stage mixing approach", **European Journal of Environmental and Civil Engineering, Taylor & Francis**, 27(3), 1429-1445, DOI: [10.1080/19648189.2022.2083023](https://doi.org/10.1080/19648189.2022.2083023).
23. Mandal, R., Panda, S. K., **Nayak, S.** and Chakraborty, S. (2022), "Efficacy of pond ash (PA) combined with ground granulated blast furnace slag (GGBFS) in producing cement-less mortar", **Structures, Elsevier**, 45, 748-757, DOI: [10.1016/j.istruc.2022.09.060](https://doi.org/10.1016/j.istruc.2022.09.060).
24. Ranjan, N., Banerjee, S., **Nayak, S.** and Das, S. (2022), "Efficacy of waste plastic towards enhancement of shear and flexure carrying capacity of masonry structures", **Journal of Cleaner Production, Elsevier**, 365, 132669, DOI: [10.1016/j.jclepro.2022.132669](https://doi.org/10.1016/j.jclepro.2022.132669).

25. Mohanty, M., Mohapatra, S. S. and **Nayak, S. (2022)**, “Efficacy of C&D waste in base/subbase layers of pavement - current trends and future perspectives: a systematic review”, **Construction and Building Materials**, Elsevier, 340, 127726, DOI: [10.1016/j.conbuildmat.2022.127726](https://doi.org/10.1016/j.conbuildmat.2022.127726).
26. Banerjee, S., **Nayak, S.** and Das, S. (2021), “Adjudging efficacy of geonet reinforcement on the seismic performance of brick masonry structures: an experimental study”, **Materials and Structures**, Springer, 54(6):213, DOI: [10.1617/s11527-021-01805-8](https://doi.org/10.1617/s11527-021-01805-8).
27. Banerjee, S., **Nayak, S.** and Das, S. (2021), “Seismic performance enhancement of masonry building models strengthened with the cost-effective materials under bi-directional excitation”, **Engineering Structures**, Elsevier, 242, 112516, DOI: [10.1016/j.engstruct.2021.112516](https://doi.org/10.1016/j.engstruct.2021.112516).
28. Kisku, N., Rajhans, P., Panda, S. K., **Nayak, S.**, Pandey, V. (2020), “Development of durable concrete from C&D waste by adopting identical mortar volume method in conjunction with two-stage mixing procedure”, **Construction and Building Materials**, Elsevier, 256, 119361, DOI: [10.1016/j.conbuildmat.2020.119361](https://doi.org/10.1016/j.conbuildmat.2020.119361).
29. Banerjee, S., **Nayak, S.** and Das, S. (2020), “Augmenting the seismic performance of masonry models using polypropylene band and steel wire mesh through shaking table testing”, **Structures**, Elsevier, 26, 340-347, DOI: [10.1016/j.istruc.2020.04.027](https://doi.org/10.1016/j.istruc.2020.04.027).
30. Banerjee, S., **Nayak, S.** and Das, S. (2020), “Improving the in-plane behavior of brick masonry wallet using PP band and steel wire mesh”, **Journal of Materials in Civil Engineering**, ASCE, 32(6): 04020132, DOI: [10.1061/\(ASCE\)MT.1943-5533.0003159](https://doi.org/10.1061/(ASCE)MT.1943-5533.0003159).
31. Banerjee, S., **Nayak, S.** and Das, S. (2020), “Shear and flexural behaviour of unreinforced masonry wallet with steel wire mesh”, **Journal of Building Engineering**, Elsevier, 30, 101254, DOI: [10.1016/j.jobbe.2020.101254](https://doi.org/10.1016/j.jobbe.2020.101254).
32. Gupta, P. K., Rajhans, P., Panda, S. K., **Nayak, S.** and Das, S. K. (2020), “Mix design method for self compacting recycled aggregate concrete and its microstructural investigation by considering adhered mortar in aggregate”, **Journal of Materials in Civil Engineering**, ASCE, 32(3): 04019371, DOI: [10.1061/\(ASCE\)MT.1943-5533.0003014](https://doi.org/10.1061/(ASCE)MT.1943-5533.0003014).
33. Kisku, N., Rajhans, P., Panda, S. K., Pandey, V., **Nayak, S. (2020)**, “Microstructural investigation of recycled aggregate concrete produced by adopting equal mortar volume method along with two stage mixing approach”, **Structures**, Elsevier, 24, 742-753, DOI: [10.1016/j.istruc.2020.01.044](https://doi.org/10.1016/j.istruc.2020.01.044).
34. Rajhans, P., Kisku, N., **Nayak, S.** and Panda, S. K. (2020), “Sustainable self compacting acid and sulphate resistance RAC by two stage mixing approaches”, **Advances in Concrete Construction**, Techno Press, 9(1), 55-70, DOI: [10.12989/ acc.2020.9.1.055](https://doi.org/10.12989/acc.2020.9.1.055).
35. Rajhans, P., Chand, G., Kisku, N., Panda, S. K. and **Nayak, S. (2019)**, “Proposed mix design method for producing sustainable self compacting heat cured recycled aggregate concrete and

- its microstructural investigation”, **Construction and Building Materials**, Elsevier, 218, 568-581, DOI: [10.1016/j.conbuildmat.2019.05.149](https://doi.org/10.1016/j.conbuildmat.2019.05.149).
36. Rajhans, P., Gupta, P. K., Ranjan, R. K., Panda, S. K. and **Nayak, S. (2019)**, “EMV mix design method for preparing sustainable self compacting recycled aggregate concrete subjected to chloride environment”, **Construction and Building Materials**, Elsevier, 199, 705-716, DOI: [10.1016/j.conbuildmat.2018.12.079](https://doi.org/10.1016/j.conbuildmat.2018.12.079).
 37. Banerjee, S., **Nayak, S.** and Das, S. (2019), “Enhancing the flexural behaviour of masonry wallet using PP band and steel wire mesh”, **Construction and Building Materials**, Elsevier, 194, 179-191, DOI: [10.1016/j.conbuildmat.2018.11.001](https://doi.org/10.1016/j.conbuildmat.2018.11.001).
 38. Heydariha, J. Z., Ghaednia, H., **Nayak, S.**, Das, S., Bhattacharya, S. and Dutta, S. C. (2019), “Experimental and field performance of PP band-retrofitted masonry: evaluation of seismic behavior”, **Journal of Performance of Constructed Facilities**, ASCE, 33(1): 04018086, DOI: [10.1061/\(ASCE\)CF.1943-5509.0001233](https://doi.org/10.1061/(ASCE)CF.1943-5509.0001233).
 39. Rajhans, P., Panda, S. K. and **Nayak, S. (2018)**, “Sustainability on durability of self compacting concrete from C&D waste by improving porosity and hydrated compounds: A microstructural investigation”, **Construction and Building Materials**, Elsevier, 174, 559–575, DOI: [10.1016/j.conbuildmat.2018.04.137](https://doi.org/10.1016/j.conbuildmat.2018.04.137).
 40. Rajhans, P., Panda, S. K. and **Nayak, S. (2018)**, “Sustainable self compacting concrete from C&D waste by improving the microstructures of concrete ITZ”, **Construction and Building Materials**, Elsevier, 163, 557-570, DOI: [10.1016/j.conbuildmat.2017.12.132](https://doi.org/10.1016/j.conbuildmat.2017.12.132).
 41. Kisku, N., Joshi, H., Ansari, M., Panda, S. K., **Nayak, S.** and Dutta, S. C. (2017), “A critical review and assessment for usage of recycled aggregate as sustainable construction material”, **Construction and Building Materials**, Elsevier, 131, 721-740, DOI: [10.1016/j.conbuildmat.2016.11.029](https://doi.org/10.1016/j.conbuildmat.2016.11.029).
 42. **Nayak, S.** and Dutta, S. C. (2016), “Improving seismic performance of masonry structures with openings by polypropylene bands and L-shaped reinforcing bars”, **Journal of Performance of Constructed Facilities**, ASCE, 30 (2): 04015003, DOI: [10.1061/\(ASCE\)CF.1943-5509.0000733](https://doi.org/10.1061/(ASCE)CF.1943-5509.0000733).
 43. Dutta, S. C., **Nayak, S.**, Acharjee, G., Panda, S. K. and Das, P. K. (2016), “Gorkha (Nepal) earthquake of April 25, 2015: Actual damage, retrofitting measures and prediction by RVS for a few typical structures”, **Soil Dynamics and Earthquake Engineering**, Elsevier, 89, 171-184, DOI: [10.1016/j.soildyn.2016.08.010](https://doi.org/10.1016/j.soildyn.2016.08.010).
 44. **Nayak, S.** and Dutta, S. C. (2016), “Failure of masonry structures in earthquake: a few simple cost effective techniques as possible solutions”, **Engineering Structures**, Elsevier, 106, 53-67, DOI: [10.1016/j.engstruct.2015.10.014](https://doi.org/10.1016/j.engstruct.2015.10.014).

45. Revanth D., Akshay B., **Nayak, S.** and Dutta, S. C. (2016), “Improving resistance of masonry structures to tsunami loading”, **Journal of The Institutions of Engineers (India): Series A, Springer**, 97(2), 133-145, DOI: [10.1007/s40030-016-0155-1](https://doi.org/10.1007/s40030-016-0155-1).
46. Dutta, S. C., Mukhopadhyay, P., Saha, R. and **Nayak, S.** (2015), “2011 Sikkim Earthquake at Eastern Himalayas: Lessons learnt from performance of structures”, **Soil Dynamics and Earthquake Engineering, Elsevier**, 75, 121-129, DOI: [10.1016/j.soildyn.2015.03.020](https://doi.org/10.1016/j.soildyn.2015.03.020).
47. **Nayak, S.**, Reddy, M. H. O., Madhavi, R. and Dutta, S. C. (2014), “Assessing tsunami vulnerability of structures designed for seismic loading”, **International Journal of Disaster Risk Reduction, Elsevier**, 7, 28-38, DOI: [10.1016/j.ijdr.2013.12.001](https://doi.org/10.1016/j.ijdr.2013.12.001).
48. Bhattacharya, S., **Nayak, S.** and Dutta, S. C. (2014), “A critical review of retrofitting methods for unreinforced masonry structures”, **International Journal of Disaster Risk Reduction, Elsevier**, 7, 51-67, DOI: [10.1016/j.ijdr.2013.12.004](https://doi.org/10.1016/j.ijdr.2013.12.004).
49. Dutta, S. C., **Nayak, S.** and Dinakar, P. (2014), “Lateral period and seismic vulnerability of masonry building”, **Structures and Buildings, ICE Publishing**, 167, SB11, 633–645, DOI: [10.1680/stbu.12.00043](https://doi.org/10.1680/stbu.12.00043).
50. **Nayak, S.**, Dutta, S. C. and Dinakar, P. (2012), “Dynamic characteristics of masonry walls”, **The IUP Journal of Structural Engineering**, 5(1), 33-53.

Book Chapter [01]

1. Ranjan, N., **Nayak, S.**, Das, S. (2025). “Seismic safety evaluation of two-story masonry building built using waste fiber-reinforced mortar through shake table testing”. In: Maheshwari, B.K., Sarkar, R., Kumar, A. (eds) *Seismic Design and Performance of Structures, Soil-Structure Interaction. ICORAGEE 2024. Lecture Notes in Civil Engineering*, vol 567. pp. 37-49 Springer, Singapore. https://doi.org/10.1007/978-981-96-2096-8_4.

Conferences [11]

1. Mandal, R., Panda, S. K., **Nayak, S.** (2023), “Rheology of self-compacting concrete: A critical review and future perspective”, **International UKIERI Concrete Congress, 14th - 17th March 2023, Paper ID: UCC-2023-403, NIT Jalandhar**.
2. Mandal, R., Panda, S. K., **Nayak, S.** (2023), “Evaluation of the rheological properties of self-compacting recycled aggregate concrete”, **International UKIERI Concrete Congress, 14th - 17th March 2023, Paper ID: UCC-2023-404, NIT Jalandhar**.
3. Mokal, M. P., Mandal, R., **Nayak, S.**, Panda, S. K., (2023), “Efficacy of fly ash and slag in controlling the heat of hydration, strength, and durability of mass concrete”, **International Conference on Climate Resilient Construction and Building Materials (ICCRCBM – 2023), March 3rd – 5th, 2023, Paper ID: CRCBM_129, NIT Karnataka, Surathkal**.
4. Kumar, P. Banerjee, S. and **Nayak, S.** (2019), “Seismic vulnerability assessment of masonry structures: A computational approach”, **The Sixteenth International Conference on Civil**,

Structural & Environmental Engineering Computing & Fifth International Conference on Soft Computing & Optimisation in Civil, Structural and Environmental Engineering, 16th - 19th September, 2019, Riva del Garda, Lake Garda, Italy.

5. Banerjee, S., **Nayak, S.**, Das, S. (2018), “Cost effective retrofitting techniques for enhancing seismic behaviour of unreinforced masonry buildings”, **16SEE, 20-22nd December, 2018, IIT Roorkee**, Uttarakhand, India, Paper No. 92.
6. Banerjee, S., **Nayak, S.**, Das, S. (2018), “Experimental study on in-plane behaviour of masonry wall strengthened with steel wire mesh”, **SEC-2018, 19-21st December, 2018, Jadavpur University**, West Bengal, India.
7. **Nayak, S.**, Banerjee, S. and Das, S. (2018), “Augmenting out-of-plane behaviour of masonry wallet using PP-band and steel wire mesh”, **14th International Conference on Concrete and Technology (CONCET- 2018), 8th to 9th August, 2018, University of Malaya, Kuala Lumpur, Malaysia, IOP Conf. Series: Materials Science and Engineering 431 (2018) 072003, DOI: 10.1088/1757-899X/431/7/072003.**
8. Banerjee, S., **Nayak, S.** and Das, S. (2018), “Enhancing shear capacity of masonry wallet using PP-band and steel wire mesh”, **14th International Conference on Concrete and Technology (CONCET- 2018), 8th to 9th August, 2018, University of Malaya, Kuala Lumpur, Malaysia, IOP Conf. Series: Materials Science and Engineering 431 (2018) 072004, DOI: 10.1088/1757-899X/431/7/072004.**
9. **Nayak, S.**, Dutta, S. C. and Dinakar, P.(2013), “Seismic behaviour of masonry walls with and without openings” **IWMSID, 7th-9th February,2013, SIF, IIT Bhubaneswar**, Bhubaneswar, Odisha.
10. **Nayak, S.**, Kumar, V., Jindal, M., Dutta, S. C. and Dinakar, P. (2012), “Prediction of lateral strength of masonry walls” **9thCUEE and 4th ACEE, 6th-8thMarch, 2012, Tokyo, Japan, 2012, Paper ID: 07-141.**
11. Parhi, P. K. and **Nayak, S.** (2009), “Free vibration analysis of delaminated composite structures by finite element method”, **Proceeding-Golden Jubilee Session, Institution of Engineers, 8thFeb 2009, Bhubaneswar.**

R&D Projects Ongoing/Completed:

1. **Title of Project:** Augmenting Fire Vulnerability of Masonry Structures: Field Investigation, Laboratory Testing, Development of ML Based Model, and Suggestive Guidelines towards Fire Safety.
Amount: **Rs. 50,04,000/-**
Funding Agency: Advanced Research Grant (ARG, ANRF)
Duration: 3 Years
PI: **Dr. Sanket Nayak.**
Co-PI: Dr. Vishwajit Anand, IIT (BHU) Varanasi
Status: **Ongoing [SRDP 1284 G].**

2. **Title of Project:** Cost-effective Safety Solution for Low-rise Masonry Dwellings Subjected to Rock Fall Impact Induced by Landslides: Laboratory Testing, Field Demonstration and Development of Guidelines for Hilly Regions.
Amount: **Rs. 49,00,000/-**
Funding Agency: National Mission on Himalayan Studies (NMHS), Ministry of Environment, Forest & Climate Change (MoEF&CC).
Duration: 3 Years
PI: **Dr. Sanket Nayak.**
Status: **Ongoing [SRDP 1149 G].**
3. **Title of Project:** To Strengthen the Research Facilities in the Department of Civil Engineering.
Amount: **Rs. 1,91,00,000/-**
Funding Agency: DST (FIST)
Duration: 5 Years
PI: HOD, Dept. of Civil Engineering.
Co-PI and Coordinator: **Dr. Sanket Nayak**
Status: **Ongoing [DST(FIST)(261)/2020-2021/741/CE].**
4. **Title of Project:** Benefits of Composite Cement over OPC and PSC in Terms of Strength and Durability.
Amount: **Rs. 6,00,000/-**
Funding Agency: OCL India Limited
Duration: 2 Years
PI: **Dr. Sanket Nayak.**
Co-PI: Dr. Smruti Sourava Mohapatra, Dept. of Civil Engineering
Status: **Completed [OCL/2018-2019/591/CE].**
5. **Title of Project:** Low-cost Sustainable Approach of Improving Lateral Load Resisting Capacity of Unreinforced Masonry Structures.
Amount: **Rs. 23,76,000/-**
Funding Agency: Young Scientist, Start-up Research Grant (**SERB, DST**)
Duration: 3 Years
PI: **Dr. Sanket Nayak.**
Co-PI: NIL
Status: **Completed [DST(SERB)(136)/2015-2016/460/Civil Engg.].**
6. **Title of Project:** Constructing Structure on Backfilled Open Cast Coal Mines: An Attempt to Suggest Viable Methodologies.
Amount: **Rs. 3,04,12,000/-**
Funding Agency: Coal India Limited, Ministry of Coal
Duration: 3 Years
PI: Prof. S. C. Dutta, Dept. of Civil Engineering.
Co-PI: **Dr. Sanket Nayak**
Status: **Completed [MOC(2)/2015-2016/449/CE].**
7. **Title of Project:** Investigation on Mechanical and Durability Properties of Self Compacted Concrete Prepared with Recycled Coarse Aggregate from C&D Waste.
Amount: **Rs. 18,93,600/-**

Funding Agency: Housing and Urban Development Corporation (**HUDCO**)

Duration: 3 Years

PI: Dr. Sarat Kumar Panda, Dept. of Civil Engineering.

Co-PI: **Dr. Sanket Nayak**

Status: **Completed [HUDCO(1)/2015-2016/436/CE].**

8. **Title of Project:** Assessment and Improvement of Lateral Load Resisting Capacity of Fly Ash Brick Made Masonry Structures.

Amount: **Rs. 8,80,000/-**

Funding Agency: **FRS (ISM)**

Duration: 3 Years

PI: **Dr. Sanket Nayak**

Co-PI: Nil

Status: **Completed [FRS(78)/2014-2015/CE].**

Major Consultancy Projects:

1. Name of the Work: **Structural Soundness for Human Habitation for ESIC Hospital Building and Staff Quarters.**
Client: Employees State Insurance Corporation, Adityapur
Role: CI
Status: **Completed.**
2. Name of the Work: **Structural Safety and Disability Audit of Hospital Buildings and Residential Quarters at ESIC Hospital Campus Maithon, Dhanbad, Jharkhand.**
Client: Employees State Insurance Corporation, Ranchi
Role: CI
Status: **Completed.**
3. Name of the Work: **Vulnerability Assessment of Different Structures of Koyla Bhawan at Koyla Nagar, BCCL, Dhanbad.**
Client: BCCL, Dhanbad.
Role: CI
Status: **Completed.**
4. Name of the Work: **Checking of Structural Design and Drawing of Railway Over Bridges.**
Client: NHAI, Ranchi.
Role: CI
Status: **Completed.**
5. Name of the Work: **Earthquake Structural Stability Tests of Buildings of RBI Patna.**
Client: Reserve Bank of India (RBI), Patna
Role: Co-CI
Status: **Completed.**

Membership of Professional Societies:

1. RILEM, Grade: Member
2. The Indian Society for Technical Education (ISTE), Grade: Life Member

3. The Institution of Engineers (India), Grade: Member
4. Indian Society of Earthquake Technology (ISET), Grade: Life Member
5. Indian Concrete Institute, Grade: Life Member

Reviewer of Journals and Project Proposals:

- Acted as reviewers for many Journals and Project Proposals of SERB, DST, and Mitacs.

Outreach Activities Organized:

- **Development of Cement Technology for Sustainable Infrastructure**, during 22nd -24th February, 2019, at Indian Institute of Technology (Indian School of Mines), Dhanbad, as **Coordinator**.
- **Advances in Structural and Geotechnical Engineering (ASGE)**, during 5th-9th June, 2018, at Indian Institute of Technology (Indian School of Mines), Dhanbad, as **Coordinator**.
- **Advances in Civil Engineering (ACE)**, during 6th-8th April, 2018, at Indian Institute of Technology (Indian School of Mines), Dhanbad, as **Coordinator**.
- **Sustainable Infrastructure**, during 8th-10th January, 2016 at Indian Institute of Technology (Indian School of Mines), Dhanbad, as one of the Coordinators.

Administrative Responsibilities:

- **Member, Project Monitoring Committee (projects executed by WAPCOS Ltd. and CPWD)**, from April, 2025 to till date.
- **Chairman, Project Monitoring Committee (projects executed by WAPCOS Ltd.)**, from October, 2024 to March, 2025.
- **Chief Warden, Emerald Hostel**, from July, 2023 to June 2024.
- **Warden, Emerald Hostel**, from July, 2021 to June 2023.
- **Convener, DPGC, Dept. of Civil Engineering**, from October, 2020 to October, 2022.
- **Member, Institution's Innovation Council (IIC) 3.0**, from October, 2020 to September, 2022.
- **Member, Dean's Advisory Council (Academic)**, from September, 2019 to August, 2021.
- **Coordinator M. Tech. in Structural Engineering**, from July, 2017 to October, 2020.
- **FIC, Concrete Laboratory**, from July, 2017 to July, 2021.