

Rashmi Ranjan Pattnaik, Ph.D, P.E

Professor and PI of Material Testing Centre,
Department of Agricultural Structure Civil & Environmental Engineering
CAET, OUAT, Bhubaneswar



Education:

- Ph.D. (Civil) from Glenn Department of Civil Engineering, Clemson University, USA, 2006
- M.E.(Civil) from Birla Institute of Technology, Pilani, Rajasthan, India, 1990
- B.Sc Engg (Civil), Orissa University of Agriculture and Technology, Bhubaneswar, India, 1988

Experience:

Working in OUAT Bhubaneswar since 1991 in different capacities in teaching, research and extensional work of the department.

Abroad Research Experience:

- Executed a sponsored research project as a GRA on “Evaluation of Rapid Set Patching Materials for PCC Applications”, Report Number FHWA-SC-07-07 (2008), U.S. Department of Transportation Federal Highway Administration. Repository URL <https://rosap.ntl.bts.gov/view/dot/39487>

Externally Funded Projects as PI/ schemes:

- Department of Science and Technology, Government of India, New Delhi, three-year research project on “Investigation of durability of concrete repair”, in collaboration with The Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, 2015-18
- Directorate of Horticulture, Govt. of Odisha, for “Strengthening of Material Testing center” for material testing of protected cultivation structures and development of structural design guidelines for polyhouse and shade net for the Govt. of Odisha for the year 2015-16.

Other important assignments:

- Director of Physical Plant from Mar’17 to Jun’17
- Member, Technical Committee on University Civil Constructional work, OUAT.
- Member, Technical Committee on Protective Cultivation structures, Directorate of Horticulture, Govt. Of Odisha, Bhubaneswar

Teaching Courses:

- Engineering Mechanics (U.G)
- Strength of Materials (U.G)
- Theory of Structures (U.G)
- Soil Mechanics (U.G)
- Similitude in Engineering (P.G & Ph.D)
- Experimental Stress Analysis (P.G & Ph.D)

Students guided:

Co-Guide for 4 students in Ph.D and 7 students of M. Tech.

Present research interests:

- Durability of Concrete repair
- Repair and rehabilitation of concrete structures
- Structural health monitoring using sensors

Honours and Awards:

- “Brij Mohan Lal Memorial Prize”, The Institution of Engineers (India) for the research paper titled “Investigation on Flexure Test of Composite Beam of Repair Materials and Substrate Concrete for Durable Repair”, Dec’2015
- Professional Engineer (PE) Registration, South Carolina Board of Engineers & Surveyors, USA, 2008.
- 6 awards in 5 consecutive years for best technical paper presentation in Annual Technical Session of Orissa Engineering Congress and Institution of Engineers (India), from year 1995 to 1999
- Secured 98.27 percentile in GATE exam and recipient of OUAT Merit Scholarship for UG study

Selected International trainings/ visits:

- Ph.D. study from Glenn Department of Civil Engineering, Clemson University, USA, 2006
- Research paper presentation on “Analysis of Slant Shear Bond Strength of Repair Materials Using Experimental and Finite Element Methods”, Transportation Research Board (TRB), TRB 96th Annual Meeting, January, 2007 at Washington DC, USA.
- Research paper presentation on “Investigation into Compatibility of Repair Materials with Bridge Deck Concrete,” ACI Spring Convention, at Charlotte, North Carolina, USA, March 2006

Thesis Published:

Title “Investigation into Compatibility between Repair Material and Substrate Concrete Using Experimental and Finite Element Methods”

Publisher Clemson University, 2006

Length 167 pages

Repository URL https://tigerprints.clemson.edu/all_dissertations/7

Selected research publications:

- Nayak, D. R., **Pattnaik, R. R.** Panda, B. C. (2022) Study on relative shrinkage of cement-based micro-concrete for durable concrete repair, *Cleaner Engineering and Technology, Companion journal to Journal of Cleaner production*, Elsevier, <https://doi.org/10.1016/j.clet.2022.100444>
- Nayak, D. R., **Pattnaik, R. R.** Panda, B. C. (2022) Effect of shrinkage on slant shear and flexure bond strength of cement based micro-concrete for durable concrete repair. *Journal of Building Pathology and Rehabilitation*, Springer, doi.org/10.1007/s41024-021-00161-y
- Sahu, I, Rayaguru,K, **Pattnaik, R. R.**, Dash, S.K. (2021). Effect of Conditioning Methods on Mechanical Properties of Raw Bael Fruit, *Asian Journal of Dairy and Food Research*, DOI: 10.18805/ajdfr, Article Id: DR-1788.
- Dash, B.S., Swain, S.K., Behera, D., **Pattnaik, R.R.** and Dash, A.K. (2021). Status of Combine Harvested Paddy Straw Management and Economics of Pulse Sowing in Eastern India. *Biological Forum – An International Journal*, 13(3a): 214-220.
- Prerana P. Jena, A. K. Goel, S. K. Swain, **R. R. Pattnaik** and Behera, D. 2021. Effect of Grain Moisture Content on Rupture Force of Paddy. *Int.J.Curr.Microbiol.App.Sci.* 10(02): 346-351. [doi: https://doi.org/10.20546/ijemas.2021.1002.040](https://doi.org/10.20546/ijemas.2021.1002.040)
- Prerana P. Jena, A.K. Goel, S.K. Swain, **R.R. Pattnaik** and D. Behera. 2021, Effect of Moisture Content and Loading Rate on Grain Detachment and Rupture Force of Paddy, *Biological Forum – An International Journal* 13(2): 175-183(2021)
- Nayak, D., **Pattnaik, R. R.**, Bhoi, K. C., & Panda, B. C. (2019). Investigation into Material Strength and Direction of Applied Forces to Assess Bonding Behaviour of Micro-concrete. *Journal of The Institution of Engineers (India): Series A*, 100(1), 75-82.

- Bhoi, K. C., & **Pattnaik, R. R.** (2018). Investigation into low density fly ash aggregate in micro-concrete for lightweight concrete repair. *Journal of Building Pathology and Rehabilitation*, 3(1), 10.
- **Pattnaik, R.R.** "Investigation on effect of drying shrinkage of repair materials on composite beam of repair materials and substrate concrete for durable repair", *J. Inst. Eng. India Ser. A*, (2017) 98: 85.
- Nayak, D.R, Bhoi, K.C., **Pattnaik, R.R.**, Panda, B.C "Investigation on strength and drying shrinkage of cement mortar prepared from different types of cement and different grades of sand collected from the river Mahanadi", *International Conference on Recent Advances in Mechanics and Materials (ICRAMM-2016)*, December, 2016
- **Pattnaik, R.R.** and Rangaraju, P.R. "Investigation of Slant Shear Bond Strength for selection of repair materials", *The Indian Concrete Journal*, November 2015, Vol. 89, Issue 11, pp. 38-46.
- **Pattnaik, R.R.**, Martha, R., Mohabhoj, D P and Sahu, S K,"Investigation on a new test method for determination of true bond strength of repair material for a durable concrete repair", *ICI-ACECON-2015*, Vol-II, pp
- Swain, S.K, Mohapatra, A.K, Dash, A.K and **Pattnaik, R.R.**, "Development and evaluation of a pneumatic wheel small bullock cart for small and marginal farmer of Odisha", *Journal of Extension Education, OUAT*, Vol.20, No.1, Jan.-June 2015
- **Pattnaik, R.R.** and Rangaraju, P.R. "Relationship between properties and compatibility of repair materials with substrate concrete", *The Indian Concrete Journal*, December 2014, Vol. 88, Issue 12, pp. 20-31.
- **Pattnaik, Rashmi R.**, and Prasada Rao Rangaraju. "Investigation on Flexure Test of Composite Beam of Repair Materials and Substrate Concrete for Durable Repair." *Springer Journal of The Institution of Engineers (India): Series A* 95.4 (2014): 203-209.
- **Pattnaik, Rashmi Ranjan**, and Prasada Rao Rangaraju. "Analysis of compatibility between repair material and substrate concrete using simple beam with third point loading." *Journal of Materials in Civil Engineering* 19.12 (2007): 1060-1069.
- **Pattnaik, Rashmi Ranjan**, and Prasada Rao Rangaraju. "Analysis of Slant Shear Bond Strength of Repair Materials Using Experimental and Finite Element Methods." *Transportation Research Board 86th Annual Meeting*. No. 07-3171. 2007.
- **Pattnaik, R.R** and Rangaraju, P.R, "Investigation into Compatibility of Repair Materials with Bridge Deck Concrete," *ACI Spring Convention*, Charlotte, North Carolina, USA, 2006
- **Pattnaik, R.R.**, "High Performance Concrete – a cost saving in Concreting", Published in 40th *Annual Technical Session of Institution of Engineers (India)*, Orissa State Center, Bhubaneswar, January 17, 1999
- **Pattnaik, R.R.**, and Patra, T.C, "Computer Aided Design of RCC Column under Axial Load & Biaxial Bending, " published in 44th *Annual Technical session of Orissa Engineering Congress*, Bhubaneswar, January 18, 1999
- **Pattnaik, R.R.**, Patra, T.C, and Roy, G.P, "P.C. Based mix design for normal concrete", Published in 40th *Annual session of Orissa Engineering Congress*, Bhubaneswar, January 23, 1995

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