

Brief Profile

Shailendra Kumar

(Ph.D. IIT Kharagpur)

Professor

Civil Engineering Department, Institute of Technology
Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, C.G.– 495009

Phone: 07752-260429, Mobile: 09806846850, Fax: 07752-260007

Email: shailendrakmr@yahoo.co.in

Research Interests/Expertise: Fracture Mechanics of Concrete, Soft Computing Applications to R.C. Structures, Fibre-reinforced Concrete, Alternate Construction Materials.

Educational Qualifications:

- Ph.D. in Structural (Civil) Engineering completed in 2010 from Indian Institute of Technology, Kharagpur, W.B. – 721 302, India.
- M.E. in Structural (Civil) Engineering completed in 1996 with 81.70% of marks from National Institute of Technology, Rourkela, Orissa – 769 008, India.
- B.Sc. (Engg.) in Civil Engineering completed in 1993 with 75.81% of marks from National Institute of Technology, Jamshedpur, Jharkhand – 831 014.
- Intermediate of Science (Math) completed in 1987 with 71.89% of marks from B.I.E.C., Patna, Bihar, India.
- 10th (Matric) Board completed in 1985 with 66.89% of marks from B.S.E.B., Patna, Bihar, India.

Distinctions Achieved:

- Invited as Member-cum-Secretary in the proposal for a new RILEM Technical Committee (created in 2011) TC TDK for “Testing methods for determination of double-K criterion for crack propagation in concrete”.
- My Ph.D. work was nominated for Innovative Students Project Award – 2010 by Indian National Academy of Engineering (INAE).
- Received Indian National Group of the IABSE medal award for the best paper entitled “Shear Strength of Reinforced Fibrous Concrete Beams Without Web Reinforcement” published in journal the Bridge and Structural Engineer, 2000,30(3),17-29.

Research Publications:

- International Journal: **15** (including **one** communicated)
- National Journals: **09**
- International/National Conferences/Seminars: **20**

Book Authored: 01

- Kumar S. and Barai S.V. (2011). Concrete Fracture Models and Applications. ISBN 9783642167638 (Hard Cover), *Springer*.

Research Guidance:

Masters Level: 02

Doctoral Level: 01 (in progress)

Testing & Consultancy Undertaken: 30, **Participation in Seminar/Symposium/Workshop:** 09

Participation in Short Term Courses: 15 weeks.

Research Publications

International Journal:

1. Kumar S. and Barai S.V. (2013). Numerical characterization of fracture parameters for crack propagation in concrete. *Computers and Concrete An International Journal* (Communicated).
2. Kumar S. and Barai S.V. (2012). Predicting the Flexural Strength of Steel Fiber Reinforced Concrete Beams using Artificial Neural Networks. *Journal of Engineering Science & Management Education, Bhopal, India* 5(IV): 639-647.
3. Kumar S. and Barai S.V. (2012). Effect of loading condition, specimen geometry, size-effect and softening function on double- K fracture parameters of concrete. *Sadhana-Academy Proceedings in Engineering Science* 37 (Part 1): 3–15.
4. Kumar S. and Pandey S.R. (2012). Determination of Double- K fracture parameters of concrete using split-tension cube test. *Computers and Concrete An International Journal* 9(2): 81-97
5. Kumar S. and Barai S.V. (2012). Size-effect of fracture parameters in concrete: a comparative study. *Computers and Concrete An International Journal* 9(1): 1-19.
6. Kumar S. and Barai S.V. (2010). Determining the Double- K fracture parameters for three-point bending notched concrete beams using weight function. *Fatigue and Fracture of Engineering Materials and Structures* 33(10): 645-660.
7. Kumar S. and Barai S.V. (2010). Size-effect prediction from the double- K fracture model for notched concrete beam. *International Journal of Damage Mechanics* 9: 473-497.
8. Kumar S. and Barai S.V. (2010). Neural networks modeling of shear strength of SFRC corbels without stirrups. *Applied Soft Computing Journal* 10: 135-148.
9. Kumar S. and Barai S.V. (2009). Effect of softening function on the cohesive crack fracture parameters of concrete CT specimen. *Sadhana-Academy Proceedings in Engineering Science* 36(6): 987-1015.
10. Kumar S. and Barai S.V. (2009). Influence of loading condition and size-effect on the K_R -curve based on the cohesive stress in concrete. *International Journal of Fracture* 156:103-110.
11. Kumar S. and Barai S.V. (2009). Equivalence between stress intensity factor and energy approach based fracture parameters of concrete. *Engineering Fracture Mechanics* 76: 1357-1372.
12. Kumar S. and Barai S.V. (2009). Weight function approach for determining crack extension resistance based on the cohesive stress distribution in concrete. *Engineering Fracture Mechanics* 76: 1131-1148.
13. Kumar S. and Barai S.V. (2009). Determining double- K fracture parameters of concrete for compact tension and wedge splitting tests using weight function. *Engineering Fracture Mechanics* 76: 935-948.
14. Kumar S. and Barai S.V. (2008). Influence of specimen geometry and size-effect on the K_R -curve based on the cohesive stress in concrete. *International Journal of Fracture* 152: 127-148.
15. Kumar S. and Barai S.V. (2008). Influence of specimen geometry on determination of double- K fracture parameters of concrete: A comparative study. *International Journal of Fracture* 149: 47-66.

National Journal:

1. Kumar S. and Barai S.V. (2008). Cohesive crack model for the study of nonlinear fracture behaviour of concrete. *Journal of Institution of Engineers (India)*, CV 89 (Nov.):7-15.
2. Kumar S. and Yadav N.K. (2008). Predicting shear strength of reinforced concrete beams with stirrups using neural networks. *Journal of Institution of Engineers (India)*, CV 89 (May): 1-7.
3. Kumar S. (2006). Application of ANN for predicting the shear strength of RC beams without web reinforcement. *Journal of Structural Engineering, SERC, Chennai* 33 (4): 339-348.
4. Kumar S (2006). Flexural strength of reinforced concrete beams with and without fibers. *Journal of Structural Engineering, SERC, Chennai* 32 (6): 455-467.

5. Kumar S. (2005). Modelling steel stress at shear failure of reinforced concrete beams without web reinforcement. *Journal of the Indian National Group of the International Association for Bridge and Structural Engineering, The Bridge and Structural Engineer*, New Delhi 35(4): 1-15.
6. Kumar S. (2004). Flexural analysis of reinforced concrete beams with steel fibers. *Journal of the Indian National Group of the International Association for Bridge and Structural Engineering, The Bridge and Structural Engineer*, New Delhi 34(3): 13-27.
7. Kumar S. (2004). Shear strength of reinforced steel fibrous concrete corbels without shear reinforcement. *Journal of Institution of Engineers (India)*, CV 85 (Nov.): 202-212.
8. Choudhary A.K, Kumar S. and Verma, B.P. (2004). Pressure moulded blocks with lateritic soils. *Journal of Institution of Engineers (India)*, CV 85 (Nov.): 159-162.
9. Paswan K., Kumar S. and S.P. Ray (2000). Shear strength of reinforced fibrous concrete beams without web reinforcement. *Journal of the Indian National Group of the International Association for Bridge and Structural Engineering, The Bridge and Structural Engineer*, New Delhi, 30 (3): 17-29.

Publications in International Conferences/Seminars:

1. Kumar S. and Barai S.V. (2009). Effect of kink-point in bilinear softening on load-displacement response of pre-cracked concrete beam. Proc. of the *International Conference on Advances in Concrete, Structural and Geotechnical Engineering (ACSGE 2009)*, October 25-27, 2009, Civil Engineering Group, Birla Institute of Technology & Science, Pilani, India, pp. 162 (in Abstract Proc.).
2. Kumar S. and Barai S.V. (2008). Influence of specimen geometry on double-*K* fracture parameters of concrete. Proc. of the *Interquadrennial Conference of International Congress on Fracture 2008 (IQCIF 2008)*, August 3-7, 2008, Indian Institute of Science, Bangalore, India, pp. 82-84.
3. Kumar S. and Barai S.V. (2008). Prediction of double-*K* fracture parameters for notched concrete beams. Proc. of the *The Eleventh East Asia-Pacific Conference on Structural Engineering and Construction (EASEC-11)*, Nov. 19-20, 2008, Taipei International Convention Centre, National Taiwan University, Taipei, Taiwan, pp. 498-499.
4. Kumar S. and Barai S.V. (2008). Influence of softening function on concrete fracture using cohesive crack model. Proc. of the International Union of Theoretical And Applied Mechanics, *22nd International Congress of Theoretical and Applied Mechanics (ICTAM 2008)*, August 24-29, 2008, Adelaide, Australia, CD-ROM proceedings ISBN 978-0-9805142-1-6, pp. 51.
5. Kumar S. and Barai S.V. (2007). Numerical simulation on concrete fracture and size effect using cohesive crack model. Proc. of the *International conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM-2007)*, Department of Aerospace Engineering, I.I.T., Kharagpur Dec. 27-29, 2007, pp. 348-350 & ICTACEM-2007/152/1-13.
6. Kumar S. and Choudhary A.K. (2008). Use of hollow concrete blocks in low cost construction. Proc. *7th International Congress Concrete: Construction's Sustainable Option* Dundee, Scotland 8-10 July 2008.

Publications in National Conferences/Seminars:

7. Kumar S. and Barai S.V. (2008). Fracture behavior of concrete compact tension specimen using cohesive crack model. Proc. of the *Sixth Structural Engineering Convention (SEC-2008)*, December 18-20, 2008, Structural Engineering Research Centre, Taramani, Chennai, India, pp. 953-962.
8. Kumar S. and Barai S.V. (2008). Fracture properties of concrete from cohesive crack model and size effect model. Proc. of the *Conference on Challenges and Applications of Mathematical*

Modeling Techniques in Building Science and Technology (CAM2TBST), Feb. 7-8, 2008, CBRI, Roorkee, India, pp. 84-91.

9. Choudhary A.K., Kumar S. and Verma B.P. (2006). Pressure moulded cement stabilised mud blocks for low cost construction. Proc. of *National Conference on Application of Recycled & Marginal Materials in Construction (ARMICON 2006)*, Deptt. of Civil Engg., M.S. Ramaiah Institute of Technology, Bangalore, 19-20, May, 2006.
10. Kumar S., Choudhary A.K. and Verma B.P. (2006). Prediction of splitting tensile strength of recycled aggregate concrete. Proc. of *National Conference on Application of Recycled & Marginal Materials in Construction (ARMICON 2006)*, Deptt. of Civil Engg., M.S. Ramaiah Institute of Technology, Bangalore, 19-20, May, 2006.
11. Kumar S. and Srivastava A.K.L. (2004). An introduction of ANN and its application to civil engineering problem. Proc. *National Conference on Mathematical Modeling and Analysis (NCMMA 04)*, Oct. 8-9, 2004, at Mathematics group, BITS, Pilani – 333 031.
12. Kumar S., Jha S. K. and Verma B.P. (2000). Best fit equations for concrete mix design. Proc. *National Seminar on High Performance Concrete Composites*, Dec. 28-29, 2000, ICFRC, Chennai, pp.: HPC 4-1-HPC 4-14.
13. Choudhary A.K., Kumar S., Prasad B.K. and Ray S.P. (2000). Tensile strength of steel fibre reinforced concrete using brick aggregates. Proc. *Advances in Concrete Technology*, (ACC-2000), 21-22 Sept. 2000, Thapar Institute of Engineering and Technology.
14. Choudhary A.K., Kumar S. and Verma B.P. (2000). Workability and strength characteristics of fibre reinforced slag aggregate concrete. Proc. *Advances in Concrete Technology (ACC-2000)*, 21-22 Sept. 2000, Thapar Institute of Engineering and Technology, Patiala.
15. Kumar S., Choudhary A.K. and Verma B.P. (2000). An analytical method for proportioning of aggregates and mix design of slag aggregate concrete. Proc. *National Seminar on Advances in Cement & Concrete*, (ACC-2000), 10-11 March 2000, B.I.E.T., Jhansi., pp: 92-101.
16. Kumar S., Choudhary A.K. and Verma B.P. (1999). Workability and strength characteristics of slag aggregate concrete-An experimental investigation. Proc. *National Seminar on Recent Trends In Concrete Technology*, May 7-8, 1999, K.I.T., Coimbatore, pp.: 1-13.
17. Choudhary A.K., Kumar S., and Ray S.P. (1999). Environmental effect of curing on strength of concrete. Proc. *National Seminar on Construction Management for Sustainable Infrastructure Development (CMSID-99)*, 3-4 April, 1999, M.I.T.S., Gwalior.
18. Verma B.P., Choudhary A.K. and Kumar S. (1997). Housing in earthquake prone areas. Proc. *Eco Friendly Building Materials & Construction*, 24-26th Sept. 1997, The Institution of Engineers (India), Portblair, pp. 17-25.
19. Kumar S., Choudhary A.K. and Verma B.P. (1997). Workability and strength characteristics of blast furnace slag concrete - An experimental investigation. Proc. *National Conference on Cost Effective Materials and Techniques for Mass Housing*, June 27-28, 1997, J.N.T.U., Anantpur, pp. 81-91.
20. Verma, B.P., Choudhary, A.K. and Kumar S. (1996). An experimental investigation on blast furnace-slag concrete. Proc. *National Seminar on Advances in Low & no Waste Technology*, Dec. 6-7, 1996, Jamshedpur, pp IS.41-IS.49.

Membership of Professional Societies

- Life membership of The Indian Society for Technical Education (LM39732)
- Life membership of The Institution of Engineers (India) (AM091173-1).
- Life membership of The Indian Society for Rock Mechanics and Tunnelling Technology (LM1647).
- Senior Member of International Union of Laboratories and Experts in Construction Materials, System and Structures (RILEM 19755-2012).