

## Deepak Kumar Kamde

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### Educational Qualification

Degree	Institution	Year of Passing
Ph. D.	Indian Institute of Technology Madras (IIT Madras), Chennai, Tamil Nadu	Pursuing
M. Tech. in Structural Engineering	Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, Gujarat	2014
B. E. in Civil Engineering	Shri Ramdeobaba College of Engineering and Management (SRCOEM), Nagpur, Maharashtra	2012

### AWARDS AND ACHIEVEMENTS

1. **NACE Foundation India Scholarship** for the year 2019.
2. **NACE Graduate Student Book Store Award** for the year 2019.
3. **President of NACE Gateway India Section (NIGIS) – South Zone Student Section** from May 2018 - present.
4. Received the **Best Paper Award** for presenting the ‘Effect of exposure to UV on the performance of fusion-bonded-epoxy (FBE) coated steel rebars’, CORCON, an International conference & Expo, Mumbai, September 2019
5. Received the **Best Oral Presentation Award** for presenting ‘Electrochemical response and Service life estimation of RC structure with FBEC rebars,’ CORSYM, an International Corrosion Prevention Symposium for Research Scholars, Organized by NIGIS, Chennai, March 2018.
6. Served as **Convener of CORSYM 2018, an International Corrosion Prevention Symposium for Research Scholars** organized by NIGIS

### PATENT

**Title:** Assessment of Galvanic Anode Performance (GAP) for cathodic protection of reinforced concrete structures, **Inventors** – Radhakrishna G. Pillai and **Deepak Kumar Kamde**, Application date: September 19, 2019, Application No. 201941037729 (Application Awaiting Examination).

### PUBLICATIONS

#### Journals (Published):

- 2 **Deepak K. Kamde**, and Radhakrishna G. Pillai (2020) “Service life of concrete structures with steel rebars coated with cement-polymer-composites”, **Construction and Building Materials**, 237, pp 1-11, <https://doi.org/10.1016/j.conbuildmat.2019.117616>.

1. **Deepak K. Kamde**, Kondraivendhan B., and Desai S. (2015) “Service life prediction model for reinforced concrete structures under chloride ingress”, **Journal of Advances in Structural Engineering**, Springer's Publication, DOI: 10.1007/978-81-322-2187-6\_145

#### **Journals (submitted/to be submitted within about a month):**

- \* **Deepak K. Kamde**, and Radhakrishna G. Pillai “Effect of ultraviolet exposure on corrosion performance and service life of Fusion-Bonded-Epoxy (FBE) coated steel rebars”, **Corrosion**, NACE (Submitted, May 2020)
- \* Manu Harilal, **Deepak K. Kamde**, Sudha Uthaman, Rani P. George, Radhakrishna G. Pillai, John Philip, Albert, S.K., “Use of nanoparticles, fly ash and corrosion inhibitors to enhance the corrosion resistance of concrete structures.”, **Cement Concrete Research**, Elsevier (Submitted, April 2020)
- \* **Deepak K. Kamde**, and Radhakrishna G. Pillai “Development of test method to assess the reinforced concrete structures with coated steel rebars.”, **Materials and Corrosion**, Wiley publication
- \* **Deepak K. Kamde**, and Radhakrishna G. Pillai “Significant bond loss due to negligible corrosion of Cement-Polymer-Composite (CPC) coated steel rebars embedded in concrete”, **Materials and Structures**, Springer
- \* **Deepak K. Kamde**, Naveen Krishnan, Radhakrishna G. Pillai, George Sergi, Karthikeyan M. Dhruvesh Shah, Rajendran V., “12-year performance of cathodic protection systems in reinforced concrete slabs and life-cycle cost benefits.”, **Construction and Building Materials (CBM)**, Elsevier

#### **International Conferences**

- 20 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Corrosion and bond performance of coated steel rebars in concrete.”, CORROSION 2020, NACE, Houston, USA, June 2020 (Accepted)
- 19 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Effect of exposure to UV on the performance of fusion-bonded-epoxy (FBE) coated steel rebars.”, CORCON 2019, NACE, Mumbai, Sept 23 – Sept 26, 2019 (**Best Paper Award**)
- 18 **Deepak K. Kamde**, Naveen Krishnan, Radhakrishna G. Pillai, George Sergi, Dhruvesh Shah, Rajendran V., “8-year performance of cathodic protection systems in reinforced concrete slabs and life-cycle cost benefits.”, RILEM Spring Convention, Rovinj, Croatia, April 2019
- 17 **Deepak K. Kamde**, Dubey A., Lavangia R., Ram K., and Radhakrishna G. Pillai “Effect of replacement level of GGBFS and microslag on diffusion coefficients of concrete.”, 3rd R. N. Raikar Memorial International Conference, Mumbai, India, December 2018
- 16 Krishan N., **Deepak K. Kamde**, and Radhakrishna G. Pillai “Cost-benefit analysis of reinforced concrete repair with and without sacrificial anodes.”, 3rd R. N. Raikar Memorial International Conference, Mumbai, India, December 2018 (only presentation)
- 15 Dhanya B. S., Varghese A. I., Rudhan A., Ajayan A., Malavika S., **Deepak K. Kamde** “Effect of surface preparation on the corrosion resistance of cement polymer composite coated steel reinforcement”, 3rd R. N. Raikar Memorial International Conference, Mumbai, India, December 2018

- 14 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Effect of Corrosion Level on Bond Performance of Cement Polymer Composite (CPC) Coated Rebar.”, ICCRRR (International Conference on Concrete Repair, Rehabilitation, and Retrofitting), Cape Town, South Africa, November 2018
- 13 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Performance assessment of sacrificial anodes for cathodic protection of reinforced concrete structures”, ICCRRR, Cape Town, South Africa, November 2018
- 12 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Development of short-term test method to assess the performance of sacrificial anode for cathodic protection of concrete structures.”, CORCON 2018, NACE, Jaipur, Sept 30 – Oct 3, 2018.
- 11 Zameel D. V., Naveen K., **Deepak K. Kamde**, and Radhakrishna G. Pillai “Effect of concrete resistivity on performance of SACP anodes.”, CORCON 2018, NACE, Jaipur, Sept 30 – Oct 3, 2018. (only presentation)
- 10 Joseline D., **Deepak K. Kamde**, Rengaraju S., and Radhakrishna G. Pillai, “Residual Service Life Estimation and its Importance for Pretensioned Concrete (PTC) Bridges in Coastal Cities.”, Sixth International Conference on the Durability of Concrete Structures (ICDCS), University of Leeds, Leeds, United Kingdom
- 9 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Electrochemical response and service life estimation of Reinforced Concrete Structures with FBEC rebars.”, CORSYM 2018, IIT Madras, NACE, Chennai, March 2018. (**Best Presentation Award**)
- 8 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Short-term test methods to evaluated chloride threshold of CPC coated rebars.”, CORCON 2017, NACE, Mumbai, Sept 2017.
- 7 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Corrosion performance of Fusion Bonded Epoxy Coated steel rebars.”, ICACMS 2017, RILEM, Chennai, Sept 2017.
- 6 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Effect of surface preparation on the performance of Cement Polymer Composite (CPC) coatings for steel in concrete structures.”, CORROSION 2017, NACE, New Orleans, USA, March 2017.
- 5 **Deepak K. Kamde**, and Radhakrishna G. Pillai “Effect of surface treatment on the performance of Cement Polymer Composite (CPC) coatings for steel in concrete structures.”, CORCON 2016, NACE, Delhi, Sept 2016.
- 4 **Deepak K. Kamde**, Kondraivendhan B, and Satish N. D. “Service life Prediction model for reinforced concrete structures under chloride ingress.”, 13th biannual Structural Engineering convention 2014, Indian Institute of Technology, Delhi, Dec 2014.
- 3 **Deepak K. Kamde**, and Hulagabali A., “Comparative Study for the Design of single span bridge using AASTHO LRFD and Indian Standard Method.” International Conference on Advances in Engineering and Technology, Nagpur, Maharashtra, India, 2014.
- 2 **Deepak K. Kamde**, Hulagabali A., and Sharan Basava P, “Three-Dimensional Steady State Finite Difference Flow Model- A Case Study.”, International Conference on Emerging Trends in Civil and Mechanical Engineering, Siliguri, West Bengal, India, 2013.
- 1 **Deepak K. Kamde**, and Hulagabali A. “Comparative study for the design of single span bridge using AASHTO LRFD and Indian Standard Method”, IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684, ISSN: 2320-334X PP 40-44.

## PROFESSIONAL MEMBERSHIPS

1. NACE International (Student member since November 2015 - 930208)
  - i. Organised a National level story writing competition ‘**Corrosion in Public (CiP)**’ during January 2020
  - ii. One of the key **organisers** for national level one-day symposium on ‘Interpretation of Electrochemical Response from New-age-steel-cementitious Systems (**ERNS**)’ during January 2020
  - iii. Serving as **President** of NACE gateway India Section-South Zone (NIGIS-SZ) Student Section from September 2018 to present
  - iv. Organised a national level seminar C3S during June 2019
  - v. Served as **Convener** for an international symposium on corrosion prevention and control - CORSYM 2018.
  - vi. **Technical Editor** for proceedings of CORSYM 2018.
  - vii. Key volunteer for running the technical session during CORCON 2018 (with more than 200 presentations and 600 participants), held at Jaipur, Rajasthan, during September-October 2018.
  - viii. Key volunteer in organizing various international and national NACE events like CORCON 2015/2016/2017/2018, C3S 2016/2017/2018, CORROSION 2017.
  - ix. Reviewed the conference papers of CORCON 2016 & 2017
  - x. Volunteered for running the technical session and a mini-camp for 55 high school students during CORROSION 2017, New Orleans, USA.
2. ICI (Indian Concrete Institute) (Lifetime member – 11316)
  - i. Key organiser for one day seminar on corrosion performance of PT structures held at IIT Madras during May 2019
  - ii. Key organizer of a workshop on ‘Cathodic protection – past, present, and future’ during October. 2018
  - iii. Key organizer of an international workshop on ‘Corrosion Control in Concrete Structures’ in 2016, 2017, and 2019.
3. RILEM (Student member since 2017 – 34304)
  - i. Key member in organizing the International Conference in Advances in Construction Materials, and Systems (ICACMS) 2017.
  - ii. Key organiser of 2<sup>nd</sup> international workshop on Corrosion Control of Concrete Structures 2017

## OTHER PROJECTS INVOLVED

1. Present work
  - i. ‘Assessment, prevention, and protection of RC structure with coated rebars’, sponsored by the **Department of Science and Technology**.
  - ii. ‘Evaluation of Sacrificial Anode Cathodic Protection (SACP) systems for reinforced concrete applications’, sponsored by **Vector Corrosion Technologies, Canada and India**
  - iii. Service life prediction and suggestion of type of steel and concrete to achieve 200 + years’ service life of tunnel with rock bolt for the structure with national importance
  - iv. ‘Performance evaluation of commercially available inhibitors on corrosion resistance of steel concrete systems’, sponsored by Chemical Industries
  - v. Working in a joint research project with **Vector Corrosion Technologies Canada and India** for the long-term assessment of performance of reinforced concrete slab exposed to natural chloride environment (Mumbai)
  - vi. Service life extension of a RC residential apartment with 675 flats using sacrificial anodes, located in Kolkata, India

- vii. Corrosion assessment and health monitoring, and corrosion mitigation for extension of service life of Chajjas made of lime mortar, at Rashtrapati Bhavan (President's home), Delhi
2. Past work
    - i. Condition assessment of the office building of Industrial Development Bank of India (IDBI), Chennai was done. I was actively involved in taking corrosion measurements and prepared preparing recommendation for corrosion protection and strengthening of reinforced of office building.
    - ii. Involved in projects for repair of various reinforced concrete structures using cathodic protection systems.
    - iii. Inter laboratory research project with Rajiv Gandhi Institute of Technology Kottayam on corrosion performance of CPC coated steel rebars.

## **OUTREACH PROGRAM**

1. Delivered a talk 'Concerns about some of the reinforcing steel rebars used in reinforcing steel rebars in concrete construction in India' for a workshop on Corrosion of reinforced concrete structures and it's the effect on service life of RC structures, held at CSIR, SERC Chennai, during November 28 - 29, 2019
2. Delivered a talk 'Corrosion assessment of CPC and FBE coated steel embedded in concrete structures' for a 21-day long workshop on NDT techniques for concrete structures held at CSIR, SERC Chennai, during July 2019
3. Delivered a talk 'Corrosion performance of CPC coated steel embedded in concrete structures – a case study' in a one-day seminar on Corrosion Control in Concrete Structures organised by NIGIS South Zone and IIT Madras held at IIT Madras Chennai, during June 2019
4. Delivered a talk on demonstration of working principle of cathodic protection in concrete structures in a National workshop on 'Cathodic protection for concrete structures' held at Indian Institute of Technology Bombay (IIT B) during October 2018.
5. Delivered a talk on 'Corrosion mechanism and service life estimation of RC structures with coated rebars', during the one-day workshop 'Quality Concrete Construction', organised by Indian Concrete Institute and METCON TMT Bars, in Kochi on May 25, 2018.
6. Demonstrated and facilitated the hands-on training to 50 participants (including research scholars, academicians, and industry participants) for the two-day workshop on 'Electrochemical Corrosion Techniques: Theory and Hands-on Training', held at BSAR Crescent Institute of Science and Technology, organised by NIGIS-SZ, during March 2018.
7. Delivered a talk on 'Chloride induced corrosion and service life estimation of RC structures with coated rebars', during CEA Fest - International level annual technical program, organised by Dept. of Civil Engineering, Indian Institute of Technology Madras (IIT Madras), Chennai, during January 2018.

## **EXPERIENCES**

### **▪ Teaching**

*Assistant Professor at RK University, Rajkot, Gujarat, (June 2014 to September 2015)*

- i. *Undertaken courses for UG and PG courses*
  - a. *Structural Analysis I, II, and III (UG)*
  - b. *Concrete Technology (UG)*
  - c. *Advanced Structural Analysis (M. Tech.)*
- ii. *Modified syllabus for Structural analysis II, III, and Advanced structural Analysis.*
- iii. *In-charge of various administrative posts and responsibilities.*
- iv. *Guided two under-graduate project groups and one M. Tech. student for their academic projects*

*Graduate Teaching Assistant (January 2016 to present)*

- i. *Teaching assistant for 'Maintenance and Rehabilitation of Constructed Facilities' during June – December 2018*
- ii. *Teaching assistant for the material testing lab for the graduate course during January-July 2017 and January-July 2018*
- iii. *Teaching assistant for QEEE (Quality Enhancement in Engineering Education) for the course on Durability of Concrete*
- iv. *Teaching assistant for material testing lab for the undergraduate course during July-November 2016 and July-November 2017.*

### **▪ Research**

*Project Associate at IIT Madras, Chennai (September 2015 to December 2015).*

- i. *Estimation of residual service life of a reinforced concrete bridge with Cement Polymer Composite coated steel rebars. The rebars were coated on as received steel rebar with possible rust layer on the steel surface. This work quantified the effect of such practices on chloride threshold and corrosion free service life of RC structure with inadequately CPC coated steel rebars.*
- ii. *Estimation of chloride threshold for steel-concrete interface for the concrete mixed with various inhibitors*
- iii. *Chloride threshold estimation for pre-stressing steel, QST, and CTD bars embedded in OPC and PPC mortar*
- iv. *Corrosion performance of QST steel embedded in OPC, PPC, and LC3 using ASTM G 109 and Impressed current corrosion technique*

## **CERTIFICATION PROGRAMMES**

1. *Attended CPD course on Repair and Rehabilitation of Concrete Structures, held at University of Cape Town, during November 12 -16, 2018*
2. *Attended 1<sup>st</sup> global meet on Cathodic Protection during January 23 -24, 2018, organised by NIGIS, held at Delhi, India*
3. *Organised and attended the 2<sup>nd</sup> 'Corrosion Control in Concrete Structures (C3S)' (International workshop as a part of RILEM 2017 week)*
4. *Organised and attended the workshop on 'Textile Reinforced Concrete' (International workshop as a part of RILEM 2017 week)*
5. *Organised and attended 1<sup>st</sup> workshop on 'Corrosion Control in Concrete Structures (C3S)' during Aug 2016 held at IITM, Chennai, India.*

6. Attended Gian course on ‘Advanced Design of Bridge and Construction’ during June 2016 held at IITM, Chennai, India.
7. Attended a short-term course on ‘Advanced Concrete Technology (ACT)’ organised by IITM and secured ‘A’ grade, held at Chennai during Dec 2015.
8. Attended a workshop on ‘Recent Advances in Civil Engineering Material’ organised by SVNIT Surat during September 30 – October 02, 2014.
9. Attended International workshop on ‘Emerging Trends in Earthquake Engineering and Structural Dynamics’ organised by IIT Delhi during 20-21st December 2014.
10. Participated in A Short-Term Training Program On ‘Structural Diagnosis, Repair and Retrofitting of RCC Structures’ (Under TEQIP-II) from 24th to 28th June’ 2013 held in SVNIT, Surat, India.
11. Attended a workshop on “Introduction to Fundamentals of SAP”, ‘STADD’, and ‘FEM using MATLAB’ held in SVNIT, Surat, India.
12. Actively participated in various professional bodies activities as the organiser of national and international level events.

### **INTERNSHIPS:**

1. 45 days (December 1, 2017 to January 15, 2018) fully funded winter internship by JASSO at **Nagaoka University of Technology at Nagaoka, Niigata, JAPAN.**
2. 45 days of the Vacation Training with **Gujarat Maritime Board (GMB), Dahej, Gujarat, India** during May – June 2011.
3. 45 days summer training at **Madhusudan Agrawal Constructions** at Bilaspur, Chhattisgarh, during June 2011 for the construction work of G+2 commercial building.

### **EXTRA - CURRICULAR ACTIVITIES**

- Volunteer for teaching students at government schools in rural areas of Tamil Nadu under One Lab–One School.
- Key organizer for ‘Construct’ (National level competition to construct the lightest bridge with maximum load-carrying capacity) at SRCOEM., in Technovision 2011.
- Head of Publicity committee for organising Pratisruti 2010, a national level Cultural program, conducted annually by the SRCOEM, Nagpur, India.
- Runner up in National level Jawaharlal Nehru National Science Exhibition held at KV Jabalpur in June 2005.
- Participated in High-Altitude Trekking Programme held in Himachal Pradesh in May 2004.
- 1<sup>st</sup> runner up as Best Student of Chhindwara district for the year 2002, organised by Rotary Club and ACC Cements.

### **References**

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