

## CURRICULUM VITAE

### **KEERTHI V. THALAKKAL**

Doctoral Research Scholar

Prime Minister's Fellowship for Doctoral Research ([PMFDR](#))

Department of Civil Engineering

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### **EDUCATION**

- **Ph. D. in Civil Engineering (Building Materials)** April 2021 - Present  
Indian Institute of Technology Madras, Chennai, Tamil Nadu, India  
Topic: “Electrochemical testing and modeling of galvanic cathodic protection systems in reinforced concrete”  
Thesis submission: May 2026  
CGPA: 9.25/10
- **M. Tech. in Structural Engineering** August 2020  
National Institute of Technology Karnataka, Surathkal, Karnataka, India  
Project title: “Strengthening of reinforced concrete rectangular beam by using glass fiber reinforced polymer sheets”  
First Class with Distinction, CGPA: 9.49/10
- **B. Tech. in Civil Engineering** July 2017  
Government College of Engineering Kannur, Kannur University, Kerala  
Project title: “Evaluation of durability and strength properties of soil using Biopolymers”  
First Class with 75.48% marks

### **RESEARCH INTERESTS**

- Corrosion assessment techniques in reinforced concrete structures
- Repair and rehabilitation of concrete structures
- Electrochemical modelling of cathodic protection systems

### **ACADEMIC AND PROFESSIONAL ACHIEVEMENTS**

#### **Fellowships, Grants, and Scholarships**

- **Office of Global Engagement (OGE) Travel Grant**, IIT Madras, for attending the 79th RILEM Annual Week and ICONS 2025 conference, Vietnam (August 2025)
- **International Immersion Experience (IIE) Award** from the Office of Global Engagement, IIT Madras, for the exchange program at Oregon State University, USA (October 2024 - January 2025)
- **AMPP EMERG India scholarship (2023)**, awarded by the Association for Materials Protection and Performance (AMPP) through the EMERG Student Outreach Program

- **RILEM PhD travel grant (2023)**, for participation in the 77<sup>th</sup> RILEM Annual Week and ISSSI -2023, Vancouver, Canada (September 2023)
- **Prime Minister’s Fellowship for Doctoral Research (PMFDR)**, Anusandhan National Research Foundation (ANRF), implemented in partnership with SERB–FICCI and industrial partner Structural Specialities & Projects (India) Pvt. Ltd, (September 2022 – August 2026)

### Awards and Recognitions

- **Special recognition for the YRS award** for the paper titled “Electrochemical studies towards non-destructive testing of galvanic cathodic protection systems in reinforced concrete” at the Young Researchers’ Symposium, IIT Madras, India (January 2026)
- **Best paper award** for the paper titled “Towards development of a new criterion for performance assessment of galvanic cathodic protection systems in reinforced concrete” presented at the 2<sup>nd</sup> International Conference on Condition Assessment, Rehabilitation & Retrofitting of Structures, Roorkee, India (December 2025)
- **Best poster award** for the poster titled “Development of a new criterion for performance assessment of galvanic cathodic protection systems in reinforced concrete” presented at the 79th RILEM Annual Week and ICONS 2025, Hanoi, Vietnam, (August 2025)
- **Best Poster Award** for the poster titled “Performance assessment of galvanic anode cathodic protection systems in reinforced concrete structures” presented at the CORCON 2022, NACE/AMPP, Udaipur, India (September 2022)
- Qualified the Graduate Aptitude Test in Engineering (GATE) with a score of 677/1000 (2018)
- Recipient of the Merit-cum-Means Scholarship (2008–2012)

## PUBLICATIONS

### Journal Articles

1. **Keerthi V. Thalakkal**, Naveen Krishnan, and Radhakrishna G. Pillai. A novel method for non-destructive assessment of galvanic cathodic protection systems in reinforced concrete. (*In review, J. of Building Engineering, Elsevier on April 9, 2025; IF: 7.4*)
2. **Keerthi V. Thalakkal**, Burkan Isgor, and Radhakrishna G. Pillai. Modelling of galvanic cathodic protection for steel reinforced concrete: effects of resistivity of concrete, configuration of corrosion cells, and ageing of anodes. (*In review, Corrosion Science, Elsevier on May 20, 2026; IF: 8.5*)
3. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Electrochemical characterization of steel and zinc in cementitious systems. (*Corrosion Science, to be submitted by May 28, 2026*)
4. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Framework for the non-destructive testing of galvanic cathodic protection systems in reinforced concrete structures. (*Materials and Structures, to be submitted by June 10, 2026*)
5. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Electrochemical response from steel bars in concrete and zinc pieces in encapsulating mortar – Laboratory and field data. (*Research Data and Reports, TLC2@IIT Madras, to be submitted by June 15, 2026*)
6. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Performance of galvanic cathodic protection systems in concrete structures – Challenges and way forward. (*to be submitted*)

7. Vimal Mohan, **Keerthi V. Thalakkal**, and Radhakrishna G. Pillai. Influence of coating characteristics on the chloride Threshold of galvanized rebars. (*to be submitted*)

### **Conference papers and presentations**

1. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Invited speaker-GRS
2. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Towards development of a new criterion for performance assessment of galvanic cathodic protection systems in reinforced concrete. *Proceedings of the 2nd International Conference on Condition Assessment, Rehabilitation & Retrofitting of Structures*, Roorkee, India (December 11-13, 2025)
3. Arvinth Raj R., **Keerthi V. Thalakkal**, and Radhakrishna G. Pillai. Performance of embedded galvanic anodes in rehabilitation of corroded RC elements – A case study. *Proceedings of the 2nd International Conference on Condition Assessment, Rehabilitation & Retrofitting of Structures*, Roorkee, India (December 11-13, 2025)
4. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Electrochemical parameters and modeling of galvanic cathodic protection systems in reinforced concrete. Poster presentation at the American Concrete Institute Convention, Philadelphia, USA (November 3- 6, 2024)
5. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Evaluation of input parameters for the electrochemical modelling of cathodic protection systems in reinforced concrete. *10<sup>th</sup> International Conference on Concrete under Severe Conditions – Environment and Loading (CONSEC24)*, Chennai, India, (September 25-27, 2024) <https://consec24.com/assets/images/CONSEC24-Proceedings-Final.pdf>
6. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Evaluation of input parameters for the electrochemical modelling of cathodic protection systems in reinforced concrete. *Proceedings of the 78th RILEM Annual Week and RILEM Conference on Sustainable Materials and Structures: Meeting the major challenges of the 21<sup>st</sup> century – SMS 2024*, Toulouse, France (August 25-30, 2024)
7. **Keerthi V. Thalakkal** and Radhakrishna G. Pillai. Evaluation of performance assessment criterion for galvanic anodes in steel cementitious systems. *Proceedings of the International Conference on Condition Assessment, Rehabilitation & Retrofitting of Structures*, Hyderabad (December 10-13, 2023)
8. **Keerthi V. Thalakkal**, Naveen Krishnan, and Radhakrishna G. Pillai. Evaluation of performance assessment criterion for galvanic anodes in steel cementitious systems. *Proceedings of the 77th RILEM Annual Week and 1st Interdisciplinary Symposium on Smart & Sustainable Infrastructures (ISSSI -2023)*, Vancouver, Canada (September 04-08, 2023)
9. Vimal Mohan, Rithuparna R, **Keerthi V. Thalakkal**, Radhakrishna G. Pillai, P. Srinivasan. Microstructural studies on coating of galvanized reinforcement. *Proceedings of the 77th RILEM Annual Week and 1st Interdisciplinary Symposium on Smart & Sustainable Infrastructures (ISSSI -2023)*, Vancouver, Canada (September 04-08, 2023)
10. **Keerthi V. Thalakkal**, Naveen Krishnan, and Radhakrishna G. Pillai. Performance assessment of galvanic anode cathodic protection systems in reinforced concrete structures. *Proceedings of the International Conference on Concrete Repair, Rehabilitation, and Retrofitting (ICCRRR)*, Cape Town, South Africa (October 3-5, 2022)

## PROJECTS INVOLVED

### Ongoing projects

- i. Electrical/electrochemical modelling for non-destructive testing of cathodic protection systems in reinforced concrete structures, sponsored by the **Department of Science and Technology**.
- ii. Performance of galvanic cathodic protection systems in Supreme Chambers building in Andheri (west), Mumbai, carried out for **Structural Specialities & Projects (I) Pvt. Ltd.**. Actively involved in the installation of galvanic anodes and monitoring boxes, and also in the continuous monitoring of galvanic anodes.
- iii. Performance assessment of the galvanic cathodic protection systems installed in the DLF NTH Apartment Complex, Kolkata, sponsored by **DLF Limited, Gurugram, Haryana**. Actively involved in field measurements, data analysis, and preparation of recommendations.

### Completed projects

- i. Condition assessment of the Industrial Development Bank of India (IDBI), Chennai, including recommendations for corrosion protection and strengthening of the building.
- ii. Condition assessment of the NBCC Green View Project located at Sector 37D, Gurugram, with recommendations for repair using cathodic protection systems.
- iii. Condition assessment of the Jetty in L&T's Kattupalli Port, Tamil Nadu, including visual inspection and preparation of recommendations.
- iv. Condition assessment of Rohini Court, Delhi, including visual inspection and preparation of recommendations.

## EXPERIENCES

### Graduate Teaching Assistant (April 2021 – present)

- Delivered a lecture on “Conservation of a 100-Year-Old Steel-Reinforced Lime Concrete System in a Class-I Heritage Building Using Galvanic Anode Cathodic Protection” under CE5120 – Maintenance and Rehabilitation of Constructed Facilities.
- Delivered a lecture on “Dowel bars in rigid Pavements: application, challenges, and corrosion mitigation” under CE5215 - Concrete Pavement Technology
- Delivered a lecture on “Fusion-bonded epoxy-coated rebars in reinforced concrete structures” under CE2330 - Civil Engineering Materials and Construction
- HTRA assistance in course material and short quizzes for CE2330 – Civil Engineering Materials and Construction Jan-May 2024
- CE3410 – Construction materials lab July-Nov 2023
- CE5090 – Construction materials lab Jan-May 2023
- HTRA assistance in course material, assignment questions, and short quizzes for MRCF (Maintenance and Rehabilitation of Constructed Facilities) July-Nov 2022
- CE3060 – Basic design of reinforced concrete structures July-Nov 2022
- CE2330 – Civil Engineering Materials and Construction April-May 2021

## **Project Associate (September 2020 – March 2021)**

Indian Institute of Technology Madras, Chennai

### **i. Performance evaluation of commercially available corrosion-inhibiting admixtures in arresting corrosion**

The project aims to evaluate the effectiveness and functionality of different corrosion inhibitors for inhibiting the corrosion of TMT steel embedded in OPC and PPC concretes. I have done short-term experiments (screening tests) such as ASTM G180 and ASTM G31 to check the performance of corrosion-inhibiting admixtures. It was found that some of the inhibitors were effective in enhancing the service life of concrete structures.

### **ii. Performance evaluation of Galvanized and Plasma-coated steel reinforcement bars**

The project aimed to evaluate the corrosion and mechanical characteristics of bare (B), galvanized (G), and plasma-coated (P) steel rebars. I have done the following experiments for this project, such as i) the quality of uncoated steel rebars was assessed using TM (Tempered martensite) ring test, ii) the accelerated chloride threshold test is employed to assess the corrosion initiation in the three different steel rebars embedded in the mortar, iii) Pull out specimens were cast to evaluate the effect of corrosion on bond strength behaviour of B, G and P bars, iv) Salt spray test were done on all the rebars, localized corrosion was observed on the ribs of coated rebars where scratches were visible, and v) the microstructural characterization were done to determine the coating thickness and intermetallic phases in G and P rebar. It was found to have a discontinuous TM ring in larger diameter bars, and the chloride threshold of G rebar was higher compared to B and P rebars. Also, intermetallic corrosion was observed in G rebar.

### **iii. Electrochemical repair of the corroded weather shade of the 105-year-old Rashtrapati Bhavan building in Delhi**

The project aims to arrest the corrosion in the heavily corroding weather shades of the Rashtrapati Bhavan (The President's house) in Delhi, India. I have monitored the installation of sacrificial hybrid-galvanic anodes and the casting of the weather shade using fiber and steel-reinforced lightweight concrete. The installed CP system is planned to be assessed using a monitoring box at an interval, and the amount of depolarisation shift induced in the concrete will be recorded to evaluate the performance of the galvanic anodes.

### **iv. Service life of tunnel with rock bolt for the structure with national importance**

This project aims to predict the service life and suggest the type of steel and concrete to achieve 200+ years. To simulate a rock-like surrounding to the rock bolt, a frame of concrete was prepared using micro concrete, and the rock bolt assembly was placed inside.

### **v. Estimation of chloride threshold for prestressing steels, QST bars embedded in OPC, Fly ash, and LC3**

### **vi. Corrosion monitoring of ASTM G109 and lollipop specimens using an accelerated corrosion test**

## **PROFESSIONAL MEMBERSHIPS AND ACTIVITIES**

- Association for Materials Protection and Performance (AMPP)  
*Member since December 2021 (membership no: 11458756)*
  - Volunteer, CORCON 2022 – 28th International Conference & Expo on Corrosion, held in Udaipur during September 19–22, 2022
  - Secretary, AMPP Chennai Student Chapter (2024–2025)

- RILEM, International Union of Laboratories and Experts in Construction Materials, Systems, and Structures  
*Member since May 2021 (Membership no: 40052)*
  - Key organizer for CONSEC 2024 conference held at IIT Madras during Sep 25-27, 2024, sponsored by RILEM
  - Reviewer for papers submitted to the RILEM Annual Week Conferences 2023 and 2024

## **ACADEMIC OUTREACH AND TRAINING PROGRAMS**

1. Delivered a talk at University of Toronto, Canada, on “Electrical/electrochemical modelling and experimentation for the performance assessment of concrete-steel-anode systems” on September 11, 2023
2. Delivered a talk at Sapienza University of Rome, Italy, on “Non-destructive evaluation of galvanic cathodic protection of concrete structures” on February 12, 2026
3. Demonstrated and facilitated the hands-on training to 30 participants (including research scholars, academicians, and industry participants) during the two-day workshop on ‘Electrochemical Corrosion Techniques: Theory and Hands-on Training’, held at BSAR Crescent Institute of Science and Technology, organized by NIGIS-SZ, India during March 2023

## **SEMINAR/WORKSHOP**

- Organized and attended the 5<sup>th</sup> International Workshop on ‘Technologies for Low-carbon & Lean Construction’, held at Indian Institute of Technology Madras during January 28-30, 2026
- Volunteered for the Institute Open House event organized by Indian Institute of Technology Madras during March 2-3, 2024
- Organized and attended the 3<sup>rd</sup> International Workshop on ‘Technologies for Low-carbon & Lean Construction’ at Indian Institute of Technology Madras during January 28-31, 2024
- Attended the Global Initiative of Academic Networks (GIAN) Course on “Corrosion Prevention and Control: Importance in the era of sustainable development” at Indian Institute of Technology Madras during April 2023
- Attended a two-day workshop on “Electrochemical Corrosion Techniques: Theory and Hands-on training” organized by BSAR Crescent Institute of Science and Technology in association with AMPP India Section NACE International Gateway India Section (NIGIS) - South Zone during March 2023
- Organized and attended the 6<sup>th</sup> one-day Seminar on Corrosion Control in Concrete Structures (C3S) at Indian Institute of Technology Madras during January 2023
- Organized and attended the 2-Day International Workshop on ‘Advances in Technologies for Low Carbon & Lean Construction’ on December 10-11, 2021.
- Attended a 5<sup>th</sup> one-day seminar on Corrosion Control in Concrete Structures (C3S), organized by NACE International Gateway India Section - South Zone (NIGIS-SZ) and ICI - Chennai Centre on December 4, 2021
- Attended a RILEM Course on Steel corrosion, theory, prevention, and repair during 2022
- Volunteered for a one-week for the Faculty Development Program on “Fiber Reinforced Concrete and its Applications”, organized by the Department of Civil Engineering, National Institute of Technology Karnataka.

## PEER REVIEW ACTIVITIES

- Journal of Materials in Civil Engineering (JMCE) – 2 papers reviewed
- Cement and Concrete Composites (CCC) – 2 papers reviewed
- Corrosion – 1 paper reviewed
- Corrosion Science – 1 paper reviewed

## INTERNSHIPS & IN-PLANT TRAINING

### Summer Internship Programme

June 2019

At STUP Consultants Pvt. Ltd.

- Topic: Analysis, Design, and detailing of Hostel building

### Industrial Training

April 2016

Uralungal Labour Contract Co-operative (ULCC) Society Ltd., Kozhikode

- Topic: Performed structural analysis of the M.DIT Polytechnic College, GHSS Karaparamba, and cross-sectional design of pavement at Puthiyangadi

### Industrial Visits

- Steel Manufacturing facility (ARS)
- Recycled plant
- Cheruthoni & Idukki Arch Dam
- Kannur International Airport
- Malabar Cements in Kanjikode

## EXTRA-CURRICULAR ACTIVITIES

- Student member of the Indian Concrete Institute (ICI) during 2014-2017 under the ICI GCEK student chapter
- Developed a working model of the 'PANAMA CANAL' for YUKTI 2016 Tech fest
- Secured an A Grade in the Atlas-Making competition at the State Social Science Fair (2009)
- Volunteer, National Service Scheme (NSS), during 2013 - 2016
- Student volunteer for the Junior Red Cross during 2008 - 2010
- Participated in the group dance event at YUKTI 2016
- Secured first prize in the drawing competition conducted as part of Wildlife Week Celebrations (2011)