



**PRATIK P. BHATT, Ph.D.**  
**SR. STAFF CONSULTANT**

[ppbhatt@engsys.com](mailto:ppbhatt@engsys.com)

Dr. Pratik Bhatt is a Senior Staff Consultant at Engineering Systems Inc. (ESi). He specializes in advanced structural analysis and forensic examination of structures compromised by natural or manmade hazards. His work focuses on detailed scientific investigation, thorough field inspection, and uncovering root-cause of failures in a wide range of structural systems. As a forensic structural engineer, Dr. Bhatt has experience in application of international building codes (IBC, ASCE, ACI, AISC, & ASTM) to design effective repair and retrofit solutions for compromised structures, using traditional and composite materials.

Dr. Bhatt has a strong background in engineering mechanics, strength of materials, and nonlinear finite element based computational modeling which is complemented by his proficiency in industry-standard software and programming languages. In addition to his analytical background, Dr. Bhatt has extensive experience in utilizing state-of-the-art laboratory equipment as well as developing and executing cutting-edge testing techniques for characterizing behavior of structures and materials under extreme conditions, such as fire and blasts. He also has expertise in implementing artificial intelligence (AI) and machine learning (ML) for developing tools for predicting fire resistance of concrete structures. Dr. Bhatt has published several articles in peer-reviewed scientific journals, conferences, and books from his doctoral research which was aimed at developing a fundamental understanding of the thermo-mechanical response of fiber-reinforced polymer (FRP)-strengthened concrete flexural members under fire exposure.

At ESi, Dr. Bhatt leverages his comprehensive expertise in forensic analysis, computational modeling, and AI/ML innovations to address a broad spectrum of structural engineering challenges including damaged structures or failure of mechanical systems or components. Dr. Bhatt is passionate about implementing AI/ML for tackling structural engineering challenges and developing innovative solutions. He is committed to developing multi-hazard resistant structures and novel material applications for infrastructure resilience, making him a crucial resource for clients looking for cutting-edge and dependable engineering solutions.

**Areas of Specialization**

Advanced Structural Analysis  
Computational Modeling  
Damage Assessment  
Data Analysis and Visualization  
Design of Steel and Concrete Structures  
Engineering & Failure Analysis  
Experimental Analysis

Machine Learning and Artificial Intelligence  
Programming in Fortran, Matlab, Python  
Repair and Renovation Design  
Structural Fire Engineering  
Structural Strengthening using Polymer Composites

## **Education**

Ph.D., Civil Engineering, Michigan State University, 2021

M.S. (R), Civil Engineering (Structural), Indian Institute of Technology (IIT) Delhi, 2014

B.E., Civil Engineering, Maharaja Sayajirao University of Baroda, 2010

## **Professional Affiliations**

Member, American Society of Civil Engineers (ASCE)

Member American Concrete Institute (ACI)

## **Training and Certification**

OSHA 30 Hour General Industry Outreach

OSHA Confined Space Certification - National OSHA Foundation

## **Honors/Awards**

Department of Civil and Environmental Engineering Dissertation Completion Fellowship, 2020

Indo-US Science and Technology Forum (IUSSTF) Fellowship for Advancement of Structural Fire Engineering Research in India, 2014

GATE Fellowship from Government of India, 2011-2013

3 gold medals for Outstanding Academic Performance in B.E. Civil, 2010

## **Positions Held**

Engineering Systems, Inc., Aurora, Illinois

Sr. Staff Consultant, 2024 - Present

Walter P Moore, Kansas City, Missouri

Structural Forensic Engineer Diagnostics Group, 2022 - 2024

Michigan State University, East Lansing, Michigan

Teaching and Research Assistant, 2014 - 2021

Indian Institute of Technology (IIT) Delhi, New Delhi, India

Research Assistant, 2011 - 2014

Linde Engineering India Pvt. Ltd., Vadodara, India

Structural Design Engineer, 2010

## Technical Publications & Presentations

### Refereed Journal Papers:

- Bhatt P. P.**, and Kodur, V. K. R. (2023). "Methodologies for Evaluating FRP-Concrete Interfacial Bond Strength at Elevated Temperatures." *Fiber Reinforced Polymeric Materials and Sustainable Structures*, 19-31.
- Kodur, V. K. R., Venkatachari, S., **Bhatt, P. P.**, Matsagar, V., and Singh, S. B. (2023). "Fire Resistance Evaluation of Concrete Beams and Slabs Incorporating Natural Fiber-Reinforced Polymers." *Polymers*, 15 (3), 755.
- Kodur, V. K. R., and **Bhatt, P. P.** (2022). "Fire hazard in Tunnels: Review, Assessment, and Mitigation strategies." *The Indian Concrete Journal*, Special Issue, 96(3), 13-25.
- Bhatt, P. P.**, and Sharma, N. (2021). "Deep Neural Network to Predict Fire Resistance of FRP-Strengthened Beams." *The Concrete Industry in the Era of Artificial Intelligence*, SP-350, *American Concrete Institute*, 69-80.
- Bhatt, P. P.**, Kodur, V. K. R., Shakya, A. M., Alkrdaji, T. (2020). "Performance of Insulated FRP-strengthened Concrete Flexural Members under Fire Conditions." *Frontiers of Structural and Civil Engineering*, 15, 177-193.
- Kodur, V. K. R., **Bhatt, P. P.**, and Naser M. Z. (2019). "High Temperature Properties of Fiber Reinforced Polymers and Fire Insulation for Fire Resistance Modeling of Strengthened Concrete Structures." *Composites Part B: Engineering*, 175, <https://doi.org/10.1016/j.compositesb.2019.107104>.
- Bhatt, P. P.**, Kodur, V. K. R., and Matsagar, V. (2019). "Numerical Approach to Evaluate Elevated Temperature Behavior of Steel Fiber Reinforced Concrete Columns." *The Indian Concrete Journal Special Issue*, 93(8), 8-15.
- Kodur, V. K. R., and **Bhatt, P. P.** (2018). "A Numerical Approach for Modeling Response of Fiber Reinforced Polymer Strengthened Concrete Slabs Exposed to Fire", *Composite Structures*, 187, 226-240.
- Kodur, V. K. R., **Bhatt, P. P.**, Soroushian, P., and Arablouei, A. (2016). "Temperature and Stress Development in Ultra-High-Performance Concrete during Curing." *Construction and Building Materials*, 122, 63-71.

### Refereed Conference Papers in Proceedings:

- Bhatt, P. P.**, Kodur, V. K. R., Hawileh, R., Al-Nuaimi, N., and Abdalla, J. (2019). "Effect of Temperature Induced Bond Degradation on Fire Performance of FRP-Strengthened Concrete Beams." *7<sup>th</sup> International Colloquium on Performance, Protection & Strengthening of Structures Under Extreme Loading & Events (PROTECT 2019)*, Sep. 16-17, Whistler, Canada
- Bhatt, P. P.**, Kodur, V. K. R., Shakya, A. M., Alkrdaji, T. (2019). "Fire Resistance of Insulated FRP-Strengthened Concrete Flexural Members." *9<sup>th</sup> International Conference on Concrete Under Severe*

*Conditions - Environment & Loading (CONSEC 2019)*, Jun. 5-7, Unisinos University, Porto Alegre/RS, Brazil.

**Bhatt, P. P.**, Kodur, V. K. R., Hawileh, R., Al-Nuaimi, N., and Abdalla, J. (2018). "Numerical Model for Fire Resistance Evaluation of Steel Reinforced Polymer Strengthened Concrete Beams." *The 10<sup>th</sup> International Conference on Structures in Fire (SiF 2018)*, Jun. 6-8, FireSERT, Ulster University, Belfast, UK.

Kodur, V. K. R., and **Bhatt, P. P.** (2016). "Strategies for Mitigating Fire Hazard in Tunnel Structures." *The 6<sup>th</sup> International Workshop on Structural Life Management of Power Structures*, KEPCO-RI, Daejeon, Korea 1-12.

Kodur, V. K. R., **Bhatt, P. P.**, and Matsagar, V. (2016). "Numerical Study on Steel Fiber Reinforced Concrete Columns Subjected to Fire." *9<sup>th</sup> International Conference on Structures in Fire (SiF 2016)*, Jun. 8-10, Princeton University, Princeton, NJ, USA.

Kodur, V. K. R., Naser, M., **Bhatt P. P.** (2015). "Emerging Construction Materials for Energy Installations." Proceedings of CAETS Convocation on Pathways to Sustainability, Oct. 13-14, Delhi, India.

**Bhatt, P.**, Matsagar, V. A., and Nagpal, A. K. (2014). "Reinforced Concrete Portal Frame Subjected to Fire." National Conference on Fire Research and Engineering, Mar. 2-3, IIT Roorkee, Uttarakhand, India.

#### **Book Chapters and Thesis:**

**Bhatt, P. P.** (2021). "Fire Performance of FRP-Strengthened Concrete Flexural Members." Ph.D. Thesis, Department of Civil & Environmental Engineering, Michigan State University, East Lansing, MI.

Kodur V.K.R., Naser M., and **Bhatt, P. P.** (2017). "Emerging Construction Materials for Energy Infrastructure." *Energy Engineering*, Springer, Singapore, 113-122.

**Bhatt, P. P.** (2014). "Fire Performance of Steel Fiber Reinforced Concrete Portals." MS(R) Thesis, Department of Civil Engineering, Indian Institute of Technology (IIT) Delhi, New Delhi, India.

#### **Presentations and Seminars:**

**Bhatt, P. P.** (2021) "Fire Performance of FRP-Strengthened Concrete Flexural Members." Thornton Tomasetti, Nov. 19, New York, NY, USA

**Bhatt, P. P.** (2021) "Fire Performance of FRP-Strengthened Concrete Beams." Gilsanz Murray Steficek Engineers and Architects, May 27, New York, NY, USA

**Bhatt, P. P.** (2020) "Thermo-Mechanical Response of FRP-Strengthened RC Structures under Fire Conditions." Nuclear Science Engineering Seminar, Massachusetts Institute of Technology, Jul. 27, Cambridge, MA, USA.

**Bhatt, P. P.** (2017) "Fire Performance of Concrete Slabs Strengthened with Fiber Reinforced Polymers." ACI Spring 2017 "The Concrete Convention" Mar. 26-27, Detroit Renaissance Center, Detroit, MI, USA.