

Matthew C. Reichenbach

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Education

University of Texas at Austin, Austin, TX 2017 – 2020
Doctor of Philosophy (PhD) in Structural Engineering

Dissertation: “Experimental and Analytical Evaluation of Cross-Frame Fatigue Behavior in Steel I-Girder Bridges”

Academic Advisors: Dr. Todd Helwig, Dr. Michael Engelhardt

University of Texas at Austin, Austin, TX 2010 – 2012
Master of Science (MS) in Structural Engineering

Thesis: “Evaluating Vehicular-Induced Vibrations of Typical Highway Bridges for Energy Harvesting Applications”

Academic Advisors: Dr. Sharon Wood, Dr. Todd Helwig

Lafayette College, Easton, PA 2006 – 2010
Bachelor of Science (BS) in Civil Engineering, Summa Cum Laude

Teaching Experience

Drexel University, Philadelphia, PA 2021 – Present
Assistant Teaching Professor

- KEEN Fellow
- National Student Steel Bridge Competition (SSBC) Adviser
- *Courses Taught:*
 - ENGR 113 (First-Year Engineering Design)
 - CIVE 302 (Structural Analysis I)
 - CIVE 400 (Structural Analysis II)
 - CIVE 375 (Structural Material Behavior)
 - CIVE 402 (Structural Design II – Reinforced Concrete Design)

University of Texas at Austin, Austin, TX 2020 – 2021
Lecturer

- *Courses Taught:* CE 362N/397 (Advanced Steel Design)

Research Experience

Ferguson Structural Engineering Laboratory, Austin, TX 2017 – 2021
Postdoctoral Fellow, Graduate Research Assistant

- **NCHRP Project 12-113 | Proposed Modification to AASHTO Cross-Frame Analysis and Design**
 - *Research objective:* Improve AASHTO LRFD guidelines related to the design and analysis of cross-frame members in steel I-girder bridges through field instrumentation and analytical parametric studies

- **NCHRP Project 12-113 Extension | Evaluation of Structural Tee Sections for Use in Cross-Frames**
 - *Research objective:* Investigate the use of structural tee sections (WTs) for use in cross-frame systems
- **Simplified Design Procedures for Estimating the Lateral-Torsional Buckling Resistance of Singly-Symmetric and Nonprismatic Beams**
 - *Research objective:* Improve design solutions for buckling behavior of singly-symmetric and/or nonprismatic steel beams based on an ongoing effort of a subcommittee of AASHTO T14 (Steel Bridge Committee)
- **TxDOT Project 0-7093 | Development of Refined Design Methods for Lean-On Bracing**
 - *Research objective:* Improve design guidelines that facilitate the widespread use of lean-on bracing applications in Texas bridges
- **TxDOT Project 0-7012 | Development of Non-Fracture Critical Steel Box Straddle Caps**
 - *Research objective:* Experimentally evaluate fabrication details that allow steel straddle box caps to be classified as internally redundant, thereby removing the fracture-critical designation
- **Experimental Evaluation of AASHTO Strut-and-Tie Procedures for Varying Levels of Crack Control Reinforcement**
 - *Research objective:* Evaluate the strength and serviceability of deep RC beams with varying shear-span-to-depth ratios and crack control reinforcement

Ferguson Structural Engineering Laboratory, Austin, TX
Graduate Research Assistant

2010 – 2012

- **NIST-TIP Project 080024 | Development of Rapid, Reliable, and Economical Methods for Inspection and Monitoring of Highway Bridges**
 - *Research objective:* Develop a robust wireless monitoring system for evaluating the “health” of fracture-critical highway bridges to supplement biennial, hands-on inspections

Professional Experience

Hardesty & Hanover, Annapolis, MD
Structural Engineer

2013 – 2017

The Harman Group, King of Prussia, PA
Design Engineer

2012 – 2013

Publications

Peer Reviewed Journal Publications

1. Reichenbach, M., White, J., Park, S., Helwig, T., & Engelhardt, M. (2021). Experimental Investigation of Cross-Frames in Composite Steel I-Girder Bridges. *Journal of Structural Engineering*. [In Preparation]
2. Reichenbach, M., Helwig, T., & Engelhardt, M. (2021). Refined Design Methodology for the Lateral-Torsional Buckling of Singly-Symmetric I-Girders with Stepped Flanges. *Journal of Structural Engineering*. [In Preparation]
3. Reichenbach, M., Battistini, A., Helwig, T., & Engelhardt, M. (2021). Experimental Evaluation

of Typical Cross-Frame Details. *Journal of Bridge Engineering*. [In Preparation]

4. Reichenbach, M., Liu, Y., Helwig, T., & Engelhardt, M. (2020). Lateral-Torsional Buckling of Singly-Symmetric I-Girders with Stepped Flanges. *Journal of Structural Engineering*. [Extended Length Paper]
5. Liang, C., Reichenbach, M., Helwig, T., Engelhardt, M., & Yura, J. (2021). Effects of Shear on the Lateral Torsional Buckling of Doubly Symmetric I-Beams. *Journal of Structural Engineering*. [Under Review]

Research Reports

1. Reichenbach, M., White, J., Park, S., Zecchin, E., Moore, M., Liu, Y., Liang, C., Kovesdi, B., Helwig, T., Engelhardt, M., Connor, R., & Grubb, M. (2020). Proposed Modifications to AASHTO Cross-Frame Analysis and Design, NCHRP Report 962. Austin, TX: University of Texas at Austin.

Conference Proceedings

1. Reichenbach, M., White, J., & Helwig, T. (2021). Design and Behavior of Cross Frames in Straight and Curved Steel I-Girder Bridges. *Conference Proceedings of the World Steel Bridge Symposium Virtual Conference*: American Institute of Steel Construction. [Presentation Only]
2. Reichenbach, M., Helwig, T., & Engelhardt, M. (2020). Simplified Solutions for Estimating the Lateral-Torsional Buckling Resistance of Nonprismatic Girders. *Conference Proceedings of the Structural Stability Research Council Conference*. Atlanta, GA: Structural Stability Research Council.
3. Reichenbach, M., Helwig, T., & Engelhardt, M. (2020). Investigation of Analysis Methods for Load-Induced Fatigue Design of Cross-Frame Systems. *Conference Proceedings of the World Steel Bridge Symposium Conference*. Atlanta, GA: American Institute of Steel Construction. [Presentation Only; Cancelled due to COVID-19]
4. Reichenbach, M., Liu, Y., Helwig, T., & Engelhardt, M. (2019). Moment Gradient Factors for Singly-Symmetric I-Sections. *Conference Proceedings of the Structural Stability Research Council Conference*. St. Louis, MO: Structural Stability Research Council.
5. Reichenbach, M., Fasl, J., Samaras, V., Wood, S., Helwig, T., & Lindenberg, R. (2012). Evaluating Vehicular-Induced Bridge Vibrations for Energy Harvesting Applications. *Proceedings of SPIE Conference - Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security, SPIE 8347*. San Diego, CA: SPIE.
6. Liu, Y., Reichenbach, M., & Helwig, T. (2019). Torsional Brace Strength Requirements for Steel I-Girders. *Conference Proceedings of the Structural Stability Research Council Conference*. St. Louis, MO: Structural Stability Research Council.
7. Fasl, J., Samaras, V., Reichenbach, M., Helwig, T., Wood, S., Potter, D., & Lindenberg, R. (2013). Probabilistic Method for Estimating Remaining Fatigue Life in Steel Bridges. *Proceedings of Civil Structural Health Monitoring, CSHM-4*. Berlin, Germany.
8. Samaras, V., Fasl, J., Reichenbach, M., Wood, S., & Helwig, T. (2012). Long-Term Gage Reliability for Structural Health Monitoring of Steel Bridges. *Proceedings of SPIE Conference - Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security, SPIE 8347*. San Diego, CA: SPIE.

9. Fasl, J., Samaras, V., Reichenbach, M., Helwig, T., & Wood, S. (2012). Development of a Wireless Strain Node and the Software to Monitor Fracture-Critical Bridges. *Proceedings of SPIE Conference - Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security, SPIE 8347*. San Diego, CA: SPIE.

PhD Dissertation

1. Reichenbach, M. (2020). *Experimental and Analytical Evaluation of Cross-Frame Fatigue Behavior in Steel I-Girder Bridges*. Austin, TX: University of Texas at Austin. [Delayed Publication to 2022]

MS Thesis

1. Reichenbach, M. (2012). *Evaluating Vehicular-Induced Vibrations of Typical Highway Bridges for Energy Harvesting Applications*. Austin, TX: University of Texas at Austin.

Other Publications

1. Rao, A., Reichenbach, M., & Marcic, D. (2015, October). Structural Modeling & Evaluation of Vertical Lift Highway Bridge in Canada. *Structures Magazine*, 34-37.

Professional Registration

Professional Engineering License, Maryland #4822 2015 - Present

Professional Affiliations

Structural Stability Research Council (SSRC) 2018 – Present
Student Member

American Institute of Steel Construction (AISC) 2018 – Present
Student Member

Service Activities

J. Neils Thompson Golf Tournament, Ferguson Structural Engineering Laboratory 2018 – Present
Co-Director

Building 24 Committee, Ferguson Structural Engineering Laboratory 2018 – 2019
Co-Leader

Honors and Awards

KEEN Fellowship, Drexel College of Engineering 2021 – 2022

Friends of Alec Graduate Student Fellowship, UT Austin CAEE Department 2018

Class of 1913 Award Winner, Lafayette College 2010

2010 Carroll Phillips Bassett Prize, Lafayette College CE Department 2010

Academic All-American Soccer Team, ESPN the Magazine/CoSIDA 2008

Member of Lafayette College Division I Men's Soccer Team 2006 – 2010