PAUL H. ZIEHL, Ph.D., P.E.

University of South Carolina
Department of Civil and Environmental Engineering
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EDUCATION

- 2000 - Ph.D., Civil Engineering, University of Texas at Austin
- 1997 - M.S., Civil Engineering, University of Texas at Austin
- 1991 - B.S., Architectural Engineering, California Polytechnic State University, San Luis Obispo

EXPERIENCE

- 2013 - present: Professor, Civil and Environmental Engineering, U. South Carolina
- 2008 - 2012: Associate Professor, Civil and Environmental Engineering, U. South Carolina
- 2004 - 2008: Assistant Professor, Civil and Environmental Engineering, U. South Carolina
- 2001 - 2004: Assistant Professor, Civil and Environmental Engineering, Tulane University
- 2001: Bridge Engineer Assistant, Texas Department of Transportation, Austin, Texas
- 1994 - 2000: Graduate Research/Teaching Assistant, Phil M. Ferguson Structural Engineering Laboratory, University of Texas at Austin
- 1989 - 1994: Engineering Assistant, Armentrout, Roebuck and Company, Athens, Georgia

HONORS AND AWARDS

- 2011: Research Progress Award – University of South Carolina, College of Engineering and Computing
- 2007: Southeastern Section New Faculty Research Award, First Place – American Society of Engineering Education
- 2007: Certificate of Appreciation - ASTM Committee E-07 on Nondestructive Testing
- 2004: ASCE Teacher of the Year Award - Department of Civil and Environmental Engineering, Tulane University
- 2002, 2004: Award of Excellence - Advisor for PCI Big Beam, Prestressed Concrete Institute
- 1999 - 2000: Harold Dalrymple Endowed Presidential Scholarship - Department of Civil Engineering, The University of Texas at Austin
- 1998 - 1999: John Focht Endowed Presidential Scholarship – Department of Civil Engineering, The University of Texas at Austin
- 1998 - 1999: University Tuition Fellowship - Department of Civil Engineering, The University of Texas at Austin

RESEARCH INTERESTS

- Structural Health Monitoring and Assessment
- Optimized and Innovative Materials for Infrastructure
- Nondestructive Evaluation
- Seismic Design and Rehabilitation
- Structural Prognosis
- In-Situ Evaluation and Load Testing
- Accelerated Construction

COURSES TAUGHT

- Composite Materials for Civil Applications (Graduate)
- Composite Materials (Graduate)
- Advanced Mechanics of Materials (Graduate)
- Prestressed Concrete Analysis and Design (Graduate)
- Advanced Reinforced Concrete (Graduate)
- Reinforced Concrete Analysis and Design (Undergraduate)
- Mechanics of Solids (Undergraduate)

REGISTERED PROFESSIONAL ENGINEER

- South Carolina (active)
- Louisiana, Georgia, and Texas (inactive)

SCIENTIFIC AND PROFESSIONAL SOCIETIES

- American Concrete Institute (ACI)
- American Society of Mechanical Engineers (ASME)
- American Society of Civil Engineers (ASCE)
- Precast/Prestressed Concrete Institute (PCI)
- Sigma Xi, Chi Epsilon, Phi Kappa Phi

POST-DOCTORAL RESEARCH SUPERVISION

- Jianguo Yu (Research Assistant Professor): 2009 – 2013
- Boris Zarate (Post-Doctoral Researcher, co-supervisor): 2009 – 2012
- Mohamed ElBatanouny (Post-Doctoral Researcher): 2012 – present
- Aaron Larosche (Post-Doctoral Researcher): 2012 - 2013

GRADUATE STUDENT SUPERVISION

COMPLETED

Ph.D.

- Mozahid Hossain: 2013, *Probability of Detection Based on Acoustic Emission Associated with Fatigue Crack Extension in Steel Bridge Material*
- Mohamed ElBatanouny: 2012, *Implementation of Acoustic Emission as a Non-Destructive Testing and Evaluation Method for Concrete Structures.*
- Aaron Larosche: 2012, *Behavior of Prestressed Pile to Bent Cap Connections and Evaluation with Acoustic Emission*
- Francisco Barrios: 2010, *Acoustic Emission and CLT Method for Integrity Evaluation of Normal Weight and Lightweight SCC Girders*
- Shawn Carey: 2008, *Damage Detection and Characterization in CFRP Composites Using Acoustic Emission and Acousto-Ultrasonics*
- Zhiwei Liu: 2007, *Evaluation of Reinforced Concrete Beams using Cyclic Load Test, Acoustic Emission, and Acousto-Ultrasonics*
- Yizhuo Chen: 2007, *Optimization of Hybrid FRP/RC Bridge Beam System*

M.S.

- Matthew Jones: 2013, *Structural Health Monitoring of Concrete Systems*
- Clark Baer: 2013, *Investigation of Longitudinal Joints between Precast Prestressed Deck Bulb Tee Girders Using Latex Modified Concrete*

- Aditya Apalla; 2013, *Assessing Corrosion Damage in Post-Tensioned Concrete Structures using Acoustic Emission and a Preliminary Investigation of Biopolymer Doped Cement Mortar for use in Structural Restoration*
- Marwa Abdelrahman; 2013, *Assessment of Damage in Concrete Structures Using Acoustic Emission*
- Bradley Mustain: 2012, *Finite Element Analysis of the Connection Behavior of Precast Prestressed Piles to Cast-in-Place Bent Caps*
- Jese Mangual: 2011, *Assessing Corrosion Damage in Prestressed Concrete with Acoustic Emission*
- Aaron Larosche: 2011, *The Connection Behavior of Precast Prestressed Piles to Cast-In-Place Bent Caps*
- Mohamed ElBatanouny: 2010, *Effect of Confinement on Prestressed Pile to CIP Bentcap Connections in Seismic Regions*
- Shawn Sweigart: 2010, *Seismic Performance of Prestressed Concrete Piles in CIP Reinforced Concrete Pile Caps*
- Joel Fuziol: 2009*, Numerical Simulation of Pile to Pile-Cap Connections Subjected to Seismic Forces*
- Alexander Colmorgan: 2008, *Performance of AASHTO Type III Bridge Girders Made with Self-Consolidating Concrete (co-advisor)*
- Robert Howard: 2007, *Characterization and Benefits of Self-Consolidating Concrete for Use in Prestressed Bridge Girders (co-advisor)*
- Francisco Barrios: 2006, *Effects of Temperature on the Nondestructive Evaluation of Fiberglass Tensile Specimens*
- Adam Ridge: 2004, *Nondestructive Techniques for Field Evaluation of FRP Strengthened Reinforced Concrete Bridge Beams*
- Chris Tanner: 2004, *Evaluation of the Fatigue Behavior of High Performance Concrete Bulb-Tee Girders*
- Thomas Cole: 2003, *Finite Element Modeling and Experimental Verification of Fiber-Reinforced Polymer Honeycomb Sandwich Flat Slab Bridges*

IN PROGRESS

Ph.D.

- Rafal Anay, expected 2018
- Lateef Assi, expected 2016
- Jese Mangual, expected 2014
- Marwa Abdelrahman, expected 2014
- Nima Zohadi (co-advisor), expected 2014

M.S.

- None

UNDERGRADUATE STUDENT SUPERVISION

U. SOUTH CAROLINA

- Frank Baker: research assistant, 2012 - 2013
- Michael Miller: research assistant, 2010 - 2012
- Seth Franklin: research assistant, 2010 – 2012
- Grace Beaty: research assistant, 2010 - 2012
- Tripp Swicord: research assistant, 2010 - 2011
- Christopher Roof: research assistant, 2010

- Ken Hora: research assistant, 2010
- Daniel Learn: research assistant, 2010
- Michael Miller: research assistant, 2010 - 2011
- Richard Kirby: research assistant, 2010
- Stacey Johnson: research assistant, 2009
- William McIntosh: research assistant, 2009 - 2010
- Johnavan Legette: research assistant, 2009
- Zachary Johnson: research assistant, 2009
- David Boyer: research assistant, 2009
- Dennis Johnisee: research assistant, 2008
- Daniel Learn: research assistant, 2008
- Billy Estrada: research assistant, 2008
- David Dickinson: research assistant, 2008
- Zachary Smith: research assistant, 2008
- Michael Woolington: research assistant, 2007
- Shawn Sweigart: research assistant, 2007 - 2008
- Jese Manguel: research assistant, 2007
- David Harris: research assistant, 2006
- Alex Colmorgan: special topics course, 2006
- Alex Colmorgan: research assistant, 2005
- Jessica Hall: research assistant, 2005

TULANE UNIVERSITY

- Jennifer Snape: Senior Honors Thesis, 2004
- David Birrcher: Senior Honors Thesis, 2004
- William Bane: Senior Honors Thesis, 2003
- Jason Constantino: LS-LAMP program, 2003
- Terrell Green: LS-LAMP program, 2003

JOURNAL PUBLICATIONS

1. *ElBatanouny, M., **Ziehl, P.**,* Larosche, A., *Mangual, J., Matta, F., and Nanni, A., (2014), "Condition Assessment of Prestressed Concrete Beams via Acoustic Emission Monitoring", *Construction and Building Materials* (*in press*).

2. *Larosche, A., Cukrov, M., Sanders, D., and **Ziehl, P.**, (2014), "Prestressed Pile to Bent Cap Connections: Seismic Performance of Full Scale 3-Pile Specimen", *ASCE Journal of Bridge Engineering (in press).*

3. *ElBatanouny, M., *Mangual, J., **Ziehl, P.,** and Matta, F., (2014), "Early Corrosion Detection in Prestressed Concrete Girders using Acoustic Emission", *ASCE Journal of Materials in Civil Engineering*, *(in press).*

4. *Abdelrahman, M., *ElBatanouny, M., and **Ziehl, P.**, (2014), "Acoustic Emission Based Damage Assessment Method for Prestressed Concrete Structures", *Engineering Structures, Vol. 60, pp. 258 – 264.*

5. ***ElBatanouny, M., Larosche, A., Mazzoleni, P., **Ziehl, P.,** Matta, F., and Zappa, E., (2014), "Identification of Cracking Mechanisms in Scaled FRP Reinforced Concrete Beams using Acoustic Emission", *Journal of Experimental Mechanics*, Vol. 54, Issue 1, pp. 69-82.

6. Aich, N., **Apalla, A., Saleh, N., and **Ziehl, P.,** (2013), "Triboluminescence for Distributed Damage Assessment in Cement Based Materials", *Journal of Intelligent Material Systems and Structures*, Volume 24, No 14, September 2013.

7. *Mangual, J., *ElBatanouny, M.K., **Ziehl, P.**, and Matta, F. (2013). "Corrosion Damage Quantification of Prestressing Strands Using Acoustic Emission", *ASCE Journal of Materials in Civil Engineering*, Vol. 25, No. 9, pp. 1326-1334.

8. Zarate, B., Caicedo, J., and **Ziehl, P.,** (2013), "Development and Implementation of a Cyber Infrastructure Framework for Research in Nondestructive Evaluation Using Acoustic Emission Data", *ASCE Journal of Computing in Civil Engineering (in press).*

9. *Larosche, A., **Ziehl, P.,** *ElBatanouny, M., and Caicedo, J., (2013), "Plain Pile Embedment for Exterior Bent Cap Connections in Seismic Regions", *ASCE Journal of Bridge Engineering (in press).*

.

10. Yu, J., **Ziehl, P.,** Matta, F., and Pollock, A., (2013), "Acoustic Emission Detection of Fatigue Cracks in Welded Cruciform Joints", *Journal of Constructional Steel Research*, Vol. 86, pp. 85-91.

11. Xu, J., Barnes, R., and **Ziehl, P.**, (2013), "Evaluation of Prestressed Concrete Beams Based on Acoustic Emission Parameters", *Materials Evaluation*, Vol. 71, No. 2, pp: 176 –185.

12. *Mangual, J., *ElBatanouny, M., **Ziehl, P.,** and Matta, F., (2013), "Acoustic Emission Based Characterization of Corrosion Damage in Cracked Concrete with Prestressing Strand," *ACI Materials Journal*, Vol. 110, No. 1, pp. 1-10.

13. Aich, N., Zohhadi, N., Khan, I., Matta, F., **Ziehl, P.**, and Saleh, N. B., (2012), "Applied TEM Approach for Micro/Nanostructural Characterization of Carbon Nanotube Reinforced Cementitious Composites", *Journal of Research Updates in Polymer Science*, Vol. 1, No. 1, pp. 14-23.

14. *ElBatanouny, M. and **Ziehl, P.**, (2012), "Determining Slipping Stress of Prestressing Strands in Confined Sections", *ACI Structural Journal,* Vol. 109, No. 06, Nov-Dec. 2012, p. 1-10.

15. Yu, J., and **Ziehl, P.,** (2012), "Stable and Unstable Fatigue Prediction for A572 Structural Steel using Acoustic Emission", *Journal of Constructional Steel Research*, Vol. 77, October 2012, pp. 173-179.

16. Zarate, B., Caicedo, J., Yu, P., and **Ziehl, P.,** (2012) "Probabilistic Prognosis of Fatigue Crack Growth Using Acoustic Emission Data", *ASCE Journal of Engineering Mechanics*, Vol. 138, Issue 9, September 2012, pp. 1101-1111.

17. Zarate, B., Caicedo, J., Yu, J., and **Ziehl, P.,** (2012), "Deterministic and Probabilistic Fatigue Life Prognosis in Stage II Using Acoustic Emission Data", *Journal of Constructional Steel Research*, Volume 76, September 2012, pp. 68-74.

18. Zárate, B., Caicedo, J., Yu, J., and **Ziehl, P.,** (2012), "Bayesian Model Updating and Prognosis of Fatigue Crack Growth", *Engineering Structures*, Volume 45, Issue 12, December 2012, Pages 53-61.

19. *Barrios, F., and **Ziehl, P.**, (2012), "Cyclic Load Testing for Integrity Evaluation of Prestressed Concrete Girders", *ACI Structural Journal*, Vol. 109, No. 5, September-October 2012, p. 615-623.

20. *ElBatanouny, M., **Ziehl, P.**, *Larosche, A., Mays, T., and Caicedo, J., (2012), “Effect of Confining Stress on the Slip of Prestressing Strands in CIP Bent Caps”, *ACI Structural Journal*, Vol. 109, No. 4, July-August 2012, p. 487-496.

21. Yu, L., Momeni, S., Godinez, V., Giurgiutiu, V., **Ziehl, P.**, and Yu, J., (2012), “Dual Mode Sensing with Low Profile Piezoelectric Thin Wafer Sensors for Steel Bridge Crack Detection and Diagnosis”, *Journal of Advances in Civil Engineering*, Vol. 2012, Article ID 402179, 10 pp., doi:10.1155/2012/402179.

22. *Barrios, F., and **Ziehl, P.,** (2011), “Effect of Loading Pattern on the Acoustic Emission Evaluation of Prestressed Concrete Girders”, *Journal of Acoustic Emission*, Vol. 29, p. 42-56.

23. Yu, J., **Ziehl, P.**, Zarate, B., and Caicedo, J., (2011), “Prediction of Fatigue Crack Growth in Steel Bridge Components using Acoustic Emission”, *Journal of Constructional Steel Research*, Vol. 67, No. 11, pp. 1254-1260.

24. **Ziehl, P.**, Engelhardt, M., Fowler, T., Ulloa, F., Medlock, R., and Schell, E., (2009), “Design and Live Load Evaluation of a Hybrid FRP/RC Bridge Superstructure System”, *ASCE Journal of Bridge Engineering*, Vol. 14, No. 5, pp. 309-318.

25. Ramirez, G., **Ziehl, P.**, and Fowler, T., (2009), "Effect of Temperature on Acoustic Emission Evaluation of FRP Vessels Subjected to Fluid Pressure", *ASME Journal of Pressure Vessel Technology*, Vol. 131, No. 9, pp. 1-1-6.

26. *Liu, Z. and **Ziehl, P.**, (2009), “Evaluation of RC Beam Specimens with AE and CLT Criteria”, *ACI Structural Journal*, Vol. 106, No. 3, pp. 1-12.

27. Ramirez, G., **Ziehl, P.**, and Fowler, T., (2009), "Nondestructive Evaluation of Full Scale FRP Bridge Beams Prior to Construction", *ASNT Journal of Research in Nondestructive Evaluation*, Volume 20, No. 1, pp. 32-50.

28. *Chen, Y., **Ziehl, P.**, and Harrison, K., (2009), “Experimental Characterization and Optimization of Hybrid FRP/RC Bridge Superstructure System”, *ASCE Journal of Bridge Engineering*, Vol. 14, No. 1, pp. 1-10.

29. Grimson, J., Commander, B., and **Ziehl, P**., (2008), “Superload Evaluation of the Bonnet Carre’ Spillway Bridge”, *ASCE Journal of Performance of Constructed Facilities*, Volume 22, No. 4, pp. 253-263.

30. Galati, N., Nanni, A., Tumialan, G., and **Ziehl, P.**, (2008), "In-Situ Evaluation of Two RC Slab Systems – Part I: Load Determination and Loading Procedure ", *ASCE Journal of Performance of Constructed Facilities*, Volume 22, No. 4, pp. 207-216.

31. **Ziehl, P.**, Galati, N., Tumialan, G., and Nanni, A., (2008), "In-Situ Evaluation of Two RC Slab Systems – Part II: Evaluation Criteria", *ASCE Journal of Performance of Constructed Facilities*, Volume 22, No. 4, pp. 217-227.

32. Amponsah, I., Harrison, K., Rizos, D., and **Ziehl, P.** (2008), “Estimating Net Changes in Life-Cycle Emissions from Adoption of Emerging Civil Infrastructure Technologies”, *Journal of Air and Waste Management Association,* Volume 58, pp. 55-64.

33. *Chen, Y., **Ziehl, P.**, Ramirez, G., and Fowler, T., (2007), “Effect of Temperature on the Acoustic Emission Evaluation of FRP Vessels (Tensile Tests)”, *ASME Journal of Pressure Vessel Technology*, Vol. 129, Issue 3, pp. 516-524.

34. Felkel, J., Rizos, D., and **Ziehl, P**., (2007), "Structural Performance and Design Evaluation of HPS 70W Bridge Girders", *Journal of Constructional Steel Research*, Volume 63, Issue 7, pp. 909-921.

35. **Ridge, A., and **Ziehl, P.**, (2006), "Nondestructive Evaluation of Strengthened RC Beams: Cyclic Load Test and Acoustic Emission Methods", *ACI Structural Journal*, Volume 103, Issue 6, pp. 832-841.

36. **Cole, T., Lopez, M., and **Ziehl, P.**, (2006), "Fatigue Behavior and Nondestructive Evaluation of FRP Honeycomb Bridge Specimen", *ASCE Journal of Bridge Engineering*, Volume 11, Issue 4, pp. 420-429.

37. **Ziehl, P.**, Cloyd, J. and Kreger, M., (2004), "Investigation of Minimum Longitudinal Reinforcement Requirements for Concrete Columns using Present Day Construction Materials", *ACI Structural Journal*, Vol. 101, Issue 2, pp. 165-175.

38. Ulloa, F., Medlock, R., **Ziehl, P.**, and Fowler, T., (2004), "A Hybrid FRP Bridge for Texas", *Concrete International*, Volume 26, Issue 5, pp. 38-43.

39. Ramirez, G., **Ziehl, P.**, and Fowler, T., (2004), "Nondestructive Evaluation of FRP Design Criteria with Primary Consideration to Fatigue Loading", *ASME Journal of Pressure Vessel Technology*, Volume 126, Issue 2, pp. 216-228.

40. **Ziehl, P**. and Fowler, T., (2003), "Fiber Reinforced Polymer Vessel Design with a Damage Approach", *Journal of Composite Structures*, Volume 61, Issue 4, pp. 395-411.

41. **Ziehl, P.** (2003), "Superload Moves Safely over Bonnet Carre' Spillway in Louisiana", *PCI Journal*, Volume 48, Issue 5, p. 125.

42. Roebuck, D., and **Ziehl, P.**, (1995), "Structural Inspection and Rehabilitation of an Historic Timber Roof Support System", *Technical Journal of the National Academy of Building Inspection Engineers*, Volume 2, Issue 1, pp. 22-45.

**PhD advisee, **MS advisee*

JOURNAL PUBLICATIONS IN REVIEW / IN REVISION

1. Aich, N., Kim, E., *ElBatanouny, M.K., Plazas-Tuttle, J., Yang, J., **Ziehl, P.,** and Saleh, N., "Detection of Crack Formation and Stress Distribution for Carbon Fiber Reinforced Polymer Specimens through Triboluminescent-Based Imaging", *Journal of Intelligent Material Systems and Structures (in review, submitted February 2014).*

2. **Appalla, A., *ElBatanouny, M., Velez, W., and **Ziehl, P.,** "Assessing Corrosion Damage in Post-Tensioned Concrete Structures Using Acoustic Emission", *ASCE Journal of Materials in Civil Engineering (in review, submitted January 2014).*

3. Velez, W., Matta, F., and **Ziehl, P**., "Electrochemical Characterization of Early Corrosion in Prestressed Concrete Exposed to Salt Water", *Journal of Corrosion Science* (*in revision*).

4. *ElBatanouny, M., Nanni, A., **Ziehl, P**., and Matta, F., "Condition Assessment of Prestressed Concrete Beams using Load Tests", *ACI Structural Journal (in revision).*

5. *Larosche, A., **Ziehl, P**., *Mangual, J., and *ElBatanouny, M., "Damage Evaluation of Prestressed Pile to Bent Cap Connections with Acoustic Emission", *Engineering Structures (in review, submitted August 2013)*.

6. *Barrios, F. and **Ziehl, P.**, "A Global Integrity Parameter with AE for Load Testing of Prestressed Girders", *ACI Structural Journal (in revision).*

7. Lingyu Yu, L., Tian, Z., **Ziehl, P**., and *ElBatanouny, M., "Dual Mode Sensing with Piezoelectric Sensors for In-Situ Decommissioning of Nuclear Structures", *Journal of Smart Materials Research* (*in revision*).

**PhD advisee, **MS advisee*

SPECIAL PUBLICATIONS

- **Tanner, C. and **Ziehl, P.**, (2005) "An Evaluation of the Fatigue Behavior of High Performance Concrete Bulb-Tee Girders", *Seventh International Symposium on Utilization of High-Strength/High Performance Concrete, Special Publication-228,* June 20-24, Washington, D.C.

- **Ziehl, P.** and Fowler, T., (2001), "Development of a Damage Based Design Criterion for Fiber Reinforced Vessels", *ASME Pressure Vessels and Piping Special Publication*, Vol. 429, p. 93-99.

**PhD advisee, ** MS Advisee*

BOOK

- **Ziehl, P.** and Caicedo, J., (editors), (2012), "Inspection, Testing, and Monitoring of Buildings and Bridges", ICC press (ISBN-13: 9781609831981), 170 p. *(invited).*

BOOK CHAPTERS

- *Vélez, W., *ElBatanouny, M., Matta, F., and **Ziehl, P.,** (2014), "Acoustic Emission Corrosion Monitoring of Prestressed Concrete Bridge Members," *ACI SP-XXX – Advanced Materials and Sensors Towards Smart Concrete Bridges: Concept, Performance, Evaluation, and Repair*, Y. Kim (Ed.), CD-ROM #SP-XXX–X, 9 p. *(in press).*

- Washer, G. and **Ziehl, P.**, (2013), *The International Handbook of FRP Composites in Civil Engineering*, edited by M. Zoghi., "Chapter 39: Nondestructive Evaluation Methods for Composite Materials: Acoustic Methods", *CRC* press, print ISBN: 978-0-8493-2013-2; ebook ISBN: 978-1-4200-0374-1

- Matta, F., Mazzoleni, P., Zappa, E., Sutton, M., *ElBatanouny, M., *Larosche, A. and **Ziehl, P.**, (2012), "Shear Strength of FRP Reinforced Concrete Beams without Stirrups: Verification of Fracture Mechanics Formulation", *ACI SP-286 – A Fracture Approach for FRP-Concrete Structures*, M. Lopez and C. Carloni (Eds.), CD-ROM #SP-286–6, 13 p.

- **Ziehl, P.**, and Pollock, A., (2012), "Acoustic Emission", *Chapter 1: Acoustic Emission for Civil Infrastructure*, Intech (ISBN 979-953-307-372-8).

- Matta, F., **Ziehl, P**., Galati, N., and Nanni, A., (2012), "Inspection, Testing, and Monitoring of Buildings and Bridges", *Chapter 10: Research and Development of Structural Assessment Methods*, ICC press (ISBN-13: 9781609831981).

- Yu, L. and **Ziehl, P.**, (2014), "Intelligent Materials and Structural Health Monitoring: Materials, Devices, and Analysis", *John Wiley and Sons (chapter in review).*

NATIONAL AND INTERNATIONAL CONFERENCE PROCEEDINGS

1. *ElBatanouny, M. and **Ziehl, P.,** (2014), "Acoustic Emission Corrosion Monitoring of Prestressed Concrete Bridges", PCI Convention and National Bridge Conference, Washington, D.C..September 6–9.

2. *ElBatanouny, M., **Jones, M., and **Ziehl, P.,** (2014), "Assessment of Alkali-Silica-Reaction using Acoustic Emission", *2014 International Congress on Advances in Nuclear Power Plants (ICAPP)*, Charlotte, North Carolina, April 6-9.

3. Yu, L., Tian, Z., **Ziehl, P.,** and *ElBatanouny, M., (2014), "Dual Mode Sensing for Continuous Crack Monitoring on Grout Nuclear In-Situ Decommissioning Structures", *2014 International Congress on Advances in Nuclear Power Plants (ICAPP)*, Charlotte, North Carolina, April 6-9.

4. Austin, R., Forsyth, D., Yu, J., *ElBatanouny, M., and **Ziehl, P.,** (2013), "Damage Evaluation for High Temperature CFRP Components Using Acoustic Emission Monitoring", *40th Annual Review of Progress in Quantitative Nondestructive Evaluation (QNDE Conference)*, Baltimore, Maryland, July 21-26.

5. *Vélez, W., Matta, F. and **Ziehl, P.,** (2013), "Acoustic Emission Characterization of Early Corrosion in Prestressed Concrete Exposed to Saltwater", *ICOSSAR 2013*, New York, June 16 – 20.

6. Tian, Z., Yu, L., *ElBatanouny, M., **Ziehl, P.**, and Zhao, L., (2013), "A Dual Mode Imaging Array for Damage Detection in Grout Structures", *SPIE Smart Structures/NDE Conference*, San Diego, California, March 10-14.

7. *Vélez, W., Matta, F., and **Ziehl, P.,** (2013), "Early Corrosion Monitoring of Prestressed Concrete Piles Using Acoustic Emission", *SPIE Smart Structures/NDE Conference*, San Diego, March 14 – 18.

8. *Hossain, M., **Ziehl, P.,** and Yu, J., (2012), "Source Characterization of Acoustic Emission during Fatigue Crack growth in Steel Bridge Material", *NDE/NDT for Highways and Bridges: Structural Materials Technology (SMT) Topical Conference*, Aug 21-24, NY.

9. *ElBatanouny, M., *Larosche, A., **Ziehl, P.,** and Yu, L., (2012) "Wireless Monitoring of in Situ Decommissioning of Nuclear Structures using Acoustic Emission", *8th International Conference on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies 2012 (NPIC & HMIT)*, San Diego, CA, July 22-26.

10. *ElBatanouny, M., *Mangual, J., *Larosche, A., Barrios, F., **Ziehl, P.,** and Matta, F., (2012), "Acoustic Emission and Cyclic Load Test Criteria Development for Prestressed Girders", *Structural Faults and Repair*, July 3-5, Edinburgh, Scotland, UK.

11. *Hossain, M., Yu, J., **Ziehl, P.,** Zarate, B., Caicedo, J., and Matta, F. (2012), "Investigation of the Acoustic Emission Source Mechanism of a Steel Bridge Material", *Proceedings of Review of Progress in QNDE,* Denver, Colorado, July 15 - 20.

12. *ElBatanouny, M., *Mangual, J., *Vélez, W., **Ziehl, P**. and Matta, F., (2012), "Implementations of Acoustic Emission Sensing for Detecting Corrosion in Prestressed Concrete", *Proc. 5th European Conference on Structural Control (EACS 2012),* June 18-20, Genoa, Italy.

13. *Hossain, M., Yu, J., and **Ziehl, P.**, (2012), "Source Mechanisms of Acoustic Emission during Fatigue Crack Growth in Steel Bridge Components" *Proc. 5th European Conference on Structural Control (EACS 2012)*, June 18-20, Genoa, Italy.

14. *Barrios, F., and **Ziehl, P.,** (2012), "Modelacion Numerica de Pruebas de Carga Ciclica Para la Evaluacion de Dano en Vigas de Concreto Presforzado".

15. *ElBatanouny, M., *Mangual, J., Vélez, W., **Ziehl, P.**, and Matta, F., (2012), "Implementations of Acoustic Emission Sensing for Detecting Corrosion in Prestressed Concrete," *Proc. 5th European Conference on Structural Control (EACS 2012)*, June 18-20, Genoa, Italy.

16. Yu, J., **Ziehl, P**., and Pollock, A., (2012), "Signal identification in Acoustic Emission Monitoring of Fatigue Cracking in Steel Bridges", *SPIE Smart Structures/NDE, Symposium No. SSN09*, March 11-15, San Diego, California.

17. Zarate, B., Caicedo, J., and **Ziehl, P.**, (2012), "Uncertainty Quantification of Acoustic Emission Filtering Techniques", *SPIE Smart Structures/NDE*, March 11-15, San Diego, California.

18. *ElBatanouny, M., *Mangual, J., Vélez, W., **Ziehl, P.**, Matta, F., and Gonzalez-Nunez, M., (2012), "Determining Corrosion Intensity in Prestressed Concrete with Acoustic Emission", *SPIE Smart Structures/NDE*, March 11-15, San Diego, California.

19. *Mangual, J., *ElBatanouny, M., Vélez, W., **Ziehl, P.**, Matta, F., and Gonzalez-Nunez, M., (2012), "Monitoring Corrosion in Prestressed Concrete Beams using Acoustic Emission Technique", *SPIE Smart Structures/NDE*, March 11-15, San Diego, California.

20. Vélez, W., Matta, F., *ElBatanouny, M., and **Ziehl, P.**, (2012), "Acoustic Emission Monitoring of Corrosion In Prestressed Concrete Piles in Marine Environment", *Corrosion 2012, National Association of Corrosion Engineers (NACE International),* March 11-15, Salt Lake City, Utah.

21. Matta, F., Saleh, N., Zohadi, N., Aich, N., and **Ziehl, P.**, (2012), "Graphene Nanoreinforcement for Damage Tolerant Cement-Based Composites", *4th International Symposium on Nanotechnology in Construction, (NICOM4)*, Crete, Greece.

22. *ElBatanouny, M., *Mangual, J., **Ziehl, P.**, and Matta, F., (2011), "Corrosion Intensity Classification in Prestressed Concrete using Acoustic Emission Technique", *Proc. American Society for Nondestructive Testing (ASNT) Fall Conference and Quality Testing Show 2011*, October 24-29, Palm Springs, California.

23. Yu, J., and **Ziehl, P.**, (2011), "Fatigue Evaluation and Prognosis for Steel Bridges with Remote Acoustic Emission Monitoring", *Proceedings of the 8th International Workshop on Structural Health Monitoring*, Stanford University, Stanford, California.

24. Austin, R., and **Ziehl, P**., (2011), "High Temperature Health Monitoring of Organic Matrix Composites for Aircraft Engine Applications", *Proceedings of the 8th International Workshop on Structural Health Monitoring*, Stanford University, Stanford, California.

25. Zarate, B., Caicedo, J., **Ziehl, P.,** and Yu, J., (2011), "Filtering of Acoustic Emission Data using ARMA Models", *Engineering Mechanics Institute Conference (EMI2011),* Northeastern University, Boston, MA, June 2-4, 2011.

26. Fernandez, M., Caicedo, J., **Ziehl, P**., and *Larosche, A., (2011), "The Effect of Structural Stiffness Degradation in Modal Characteristics", *Engineering Mechanics Institute Conference (EMI2011),* Northeastern University, Boston, Massachusetts, June 2-4, 2011.

27. **Ziehl, P.** and Barrios, F., (2011), "Acoustic Emission Evaluation Criteria for Load Testing of Prestressed Concrete Bridge Girders", *53rd Meeting of the Acoustic Emission Working Group (AEWG-53)*, Denver, Colorado.

28. *Mangual, J., *ElBatanouny, M., Vélez, W., **Ziehl, P.**, Matta, F., and Gonzalez-Nunez, M., (2011), "Assessment of Corrosion Rate in Prestressed Concrete with Acoustic Emission", *Proc. SPIE 7981 – Smart Structures/NDE, M. Tomizuka (Ed.), SPIE, Paper #7981-53, 12 p.,* March 6-10, San Diego, California.

29. Yu, P., **Ziehl, P.**, Pollock, A., (2011), "Nondestructive Evaluation and Prognosis of Fatigue Cracking in Steel Bridges", *SPIE Smart Structures/NDE*, March 6-11, San Diego, California.

30. Gonzalez-Nunez, M., Nanni, A., **Ziehl, P.**, and Matta, F., (2011) "Overview of NIST TIP: Detection of Active Corrosion in RC and PS Concrete", *Proc. SPIE 7983 – Smart Structures/NDE, H.F. Wu (Ed.), SPIE, Paper #7983-85, 12 p*., March 6-10, San Diego, California.

31. Zarate, B., Caicedo, J., **Ziehl, P**., and Yu, J., (2011), "Model Updating and Prognosis of Acoustic Emission Data in Compact Test Specimens under Cyclic Loading", *SPIE Smart Structures/NDE*, March 6-11, San Diego, California.

32. *Larosche, A., *Mangual, J., and **Ziehl, P.**, (2011), "Damage Detection in Prestressed Pile to Bent Cap Connections", *SPIE Smart Structures/NDE*, March 6-11, San Diego, California.

33. Godinez-Azcuaga, V., Inman, D., **Ziehl, P.**, Giurgiutiu, V., and Nanni, A., (2011), "Recent Advances in the Development of a Self-Powered Wireless Sensor Network for Structural Health Prognosis", *SPIE Smart Structures/NDE*, Proc. SPIE 7983, 798325; doi:10.1117/12.880249, March 6-11, San Diego, California.

34. Yu, J. and **Ziehl, P.**, (2011),"Remote Detection of Stage II to Stage III Cracking in Steel Girder Material", *ASNT 20th Annual Research Symposium and Spring Conference*, March 21-25, San Francisco, California (*abstract only*).

35. Yu, J. and **Ziehl, P.**, (2011), "Determination of Critical Level of Fatigue Cracking in Steel Bridge Materials with Acoustic Emission", *ASCE Structures Congress*, April 14-16, Las Vegas, Nevada.

36. *ElBatanouny, M., *Mangual, J., **Ziehl, P.**, and Matta, F., (2010), "Detecting Corrosion of Steel Prestressing Strands Using Acoustic Emission," *Proc. Annual Conference of the Prognostics and Health Management Society, PHM Society, Paper #34, 8 p*., October 10-14, Portland, Oregon.

37. *Larosche, A., **Sweigart, S., Mays, T., Caicedo, J., and **Ziehl, P.**, (2010), "Behavior of Pile to Pile-Cap Connections Subject to Seismic Forces", *2010 FHWA Bridge Engineering Conference – Highways for LIFE and Accelerated Bridge Construction*, April 8 and 9, Orlando, Florida.

38. Yu, J., **Ziehl, P.**, Zarate, B., Caicedo, J., Yu, L., Giurgiutiu, V., Metrovich, B., and Matta, F., (2010), "Quantification of Fatigue Cracking in CT Specimens with Passive and Active Piezoelectric Sensing," *Proc. SPIE 7649 – Smart Structures/NDE, P.J. Shull, A.A. Diaz and H.F. Wu (Eds.), SPIE, CD-ROM #76490R, 12 p.,* March 7-11, San Diego, California,

39. Yu, L., Giurgiutiu, V., **Ziehl, P.**, Ozevin, D., and Pollock, P., (2010), “Steel bridge fatigue crack detection with piezoelectric wafer active sensors”, *Proceedings of the SPIE*, Vol. 7647, pp. 7647-70.

40. *Barrios, F., **Ziehl, P.**, Rizos, D., and Amado, B., (2010), “Investigation and recommendations related to Lightweight SCC for prestressed bridge girders”, *2010 Concrete Bridge Conference - Achieving Safe, Smart, and Sustainable Bridges*, February 24-26, Phoenix, Arizona.

41. Zárate, B., Caicedo, J., Giurgiutiu, V., Yu, L., and **Ziehl, P.**, (2010), “Bayesian Finite Element Model Updating for Crack Growth”, *Proceedings of IMAC XXVIII: A Conference and Exposition on Structural Dynamics*, February 1-4, 2010, Jacksonville, Florida.

42. Matta, F., **Ziehl, P.**, Ozevin, D., Inman, D., Giancaspro, J., Metrovich, B., Nanni, A., Caicedo, J., Gassman, S., Giurgiutiu, V., Huynh, N., Yu., L., Zarate, B., Godinez, V., Gostautas, R., Momeni, S., and Priya, S., (2009), “Self Powered Wireless Sensor Network for Structural Bridge Health Prognosis: a 5-year Research and Development Project for Infrastructure Sustainability,” *Proc. 7th International Workshop on Structural Health Monitoring (IWSHM-7)*, F.-K. Chang (Ed.), DEStech Publications, Vol. 2, 1747-1754, September 9-11, Stanford University, Stanford, California.

43. Yu, L, Giurgiutiu, V., **Ziehl, P.**, and Ozevin, D., (2009), “Piezoelectric Based Sensing in Wireless Steel Bridge Health Monitoring”, *Proceedings of the SPIE, Volume 7294*, pp. 72941D-72941D-10.

44. **Ziehl, P.**, (2008), "Applications of Acoustic Emission Evaluation for Civil Infrastructure," *SPIE Smart Structures and Materials and Nondestructive Evaluation and Health Monitoring*, March 9-13, San Diego, California, 9 pp.

45. *Chen, Y., **Ziehl, P.**, Fowler, T., and Engelhardt, M., (2007), “Design Methodology and Ultimate Capacity of a Hybrid FRP/RC Bridge System”, *Proceedings of the Polymer Composites Conference IV (PCC IV)*, March 20-22, Morgantown, West Virginia.

46. **Cole, T., Lopez, M., and **Ziehl, P.,** (2006),“Nondestructive Evaluation of Fatigue Damage to Full-Scale FRP Honeycomb Bridge Specimen”, *2006 NDE Conference on Civil Engineering, the 7th Structural Materials Technology (SMT) and the 6th International Symposium on NDT in Civil Engineering*, August 14-18, St. Louis, Missouri (abstract only).

47. McDad, P., Medlock, R., Fowler, T., and **Ziehl, P.**, (2004), “Structural Health Monitoring of an Efficient Hybrid FRP/Reinforced Concrete Bridge System”, *Proceedings of the Second International Workshop on Structural Health Monitoring of Innovative Civil Engineering Structures*, Winnipeg, Manitoba, Canada.

48. **Ziehl, P.**, Ulloa, F., McDad, P., Medlock, R., (2004), “FRP/Concrete Hybrid Bridge, San Patricio County, Texas”, *Proceedings of the 11th International Conference on Composites/Nano Engineering*, Hilton Head, South Carolina.

49. Fowler, T., Ativitavas, N., Ramirez, G., and **Ziehl, P.**, (2004), “Damage Based Design Criterion for ASME Section X Code Vessels”, *Proceedings of the 11th International Conference on Composites/Nano Engineering*, Hilton Head, South Carolina.

50. **Ziehl, P.** (2003), “Evaluation of Fatigue Life of Large Scale FRP Honeycomb Specimen with Acoustic Emission”, *Proceedings of the ASNT 12th Annual Research Symposium (abstract only)*, Orlando, Florida.

51. **Ziehl, P.** and ***Green, T., (2003), “An Experimental Study of Accumulating Damage in Fiber Reinforced Polymer Specimens”, *Proceedings of the Annual Technical Conference for the Plastics Industry*, Nashville, Tennessee.

52. **Ziehl, P**. and Fowler, T., (2002), “Fiber Reinforced Polymer Vessel Design with a Damage Approach”, *Proceedings of the ASME World Congress and Exposition*, New Orleans, Louisiana.

53. Ulloa, F., Fowler, T., **Ziehl, P.**, and Medlock, R., (2001), “FM 3284 FRP Bridge – Background and Design”, *Proceedings of the 16th American Society for Composites Conference,* Blacksburg, Virginia.

54. **Ziehl, P.** and Fowler, T., (2001), “Development of a Damage Based Design Criterion for Fiber Reinforced Vessels”, *Proceedings of the ASME Pressure Vessels and Piping Conference,* Atlanta, Georgia.

55. Ulloa, F. and **Ziehl, P.**, (2000), “Acoustic Emission Monitoring of Fiber Reinforced Beams with Composite Slabs”, *Proceedings of the ASNT 9th Annual Research Symposium*, Birmingham, Alabama.

56. **Ziehl, P.** and Fowler, T., (1999), “Use of Acoustic Emission to Determine Damage Initiation of Fiber Reinforced Polymers”, *Proceedings of the Sixth International Conference on Composites Engineering,* Orlando, Florida.

57. **Ziehl, P.** and Fowler, T., (1998), “Recommended Procedure for Determination of Design Strain in FRP Specimens”, *Proceedings of the Sixth International Symposium on Acoustic Emission from Composite Materials,* San Antonio, Texas.

**PhD advisee, **MS advisee, ***Undergraduate advisee*

NATIONAL AND INTERNATIONAL CODES, REPORTS, AND STANDARDS

- ACI 437-13: Code Requirements for Load Testing of Existing Concrete Structures and Commentary, (2014), *ACI provisional standard (primary chapter author).*

- Chapter 4: Evaluation of Concrete Structures (2013): *Task Group on Repair of Reinforced Concrete of Existing Nuclear Power Plants, Nuclear Energy Standards Coordination Collaborative (NESCC)* (*primary chapter author*).

- Chapter 5: Loading Protocol (2013): *Code Requirements and Commentary for Load Testing of Existing Concrete Structures, Reported by ACI Committee 437 (primary chapter author, approved for publication).*

- Development of a Remote Monitoring Sensor Network for In-Situ Decommissioned Structures (2010): *Panel Report for the Department of Energy, SRNL-RP-2010-01666 (contributing author).*

- Article RD-13 (2007): “Test Method for Determining Damage Based Design Criterion for Fiber Reinforced Polymer Vessels”, *American Society of Mechanical Engineers Boiler and Pressure Vessel Code; Section X: Fiber-Reinforced Plastic Pressure Vessels,* New York, New York *(primary author).*

- ACI 437.1R-07 (2007): “Load Tests of Concrete Structures: Methods, Magnitude, Protocols, and Acceptance Criteria”, *American Concrete Institute*, Farmington Hills, Michigan *(contributing author).*

- ASTM E2478-06 (2006): “Standard Practice for Determining Damage-Based Design Criteria for Fiberglass Reinforced Plastic (FRP) Materials using Acoustic Emission American Society for Testing of Materials”, *American Society of Testing and Materials*, West Conshohoken, Pennsylvania *(primary author).*

MAJOR RESEARCH REPORTS

1. **Ziehl, P.,** and *ElBatanouny, M., (2013), “Innovative Structural Health Monitoring (SHM) System Capable of Detecting, Localizing, and Characterizing Damage in Composite Aircraft Structures”, *Submitted to the U.S. Navy, N122-110, Phase I*, Final Report, 11 pp.

2. **Ziehl, P.,** Yu, J., and *ElBatanouny, M., (2013), “Built-In Damage State Detection and Localization Capabilities for Composite Engine Structures,” *Submitted to the U.S. Air Force, AF093-179*, *Phase II*, Final report.

3. **Ziehl, P.,** Yu, L., *ElBatanouny, M., and *Larosche, A., (2012), “Sensor System Phase Two Test Report: In-Situ Decommissioning Sensor Network, Meso-Scale Test Bed”, *prepared for DOE/SRNL, Final Report – Phase II*, 25 pp.

4. **Ziehl, P.,** Caicedo, J., Rizos, D., Mays, T., *Larosche, A., *ElBatanouny, M., and **Mustain, B., (2012), “Behavior of Pile to Bent Cap Connections Subject to Seismic Forces”, *South Carolina DOT Research Project 672 Final Report*, 293 pp.

5. **Ziehl, P.,** Caicedo, J., Rizos, D., Mays, T., *Larosche, A., and *ElBatanouny, M., (2011), “Testing of Connections between Prestressed Concrete Piles and Precast Concrete Bent Caps”, *Final report submitted to FHWA/SCDOT,* 79 pp.

6. **Ziehl, P.** and Yu, L., *ElBatanouny, M., and *Larosche, A., (2011), “Sensor System Phase One Test Report: In-Situ Decommissioning Sensor Network, Meso-Scale Test Bed”, *prepared for DOE/SRNL, Final Report – Phase I*, 13 pp.

7. **Ziehl, P.** and Yu, L., (2011), “Sensor System Implementation Plan: In-Situ Decommissioning Sensor Network, Meso-Scale Test Bed”, *prepared for DOE/SRNL*, 16 pp.

8. **Ziehl, P.,** (2010), “AF093-179 Built-In Damage State Detection and Localization Capabilities for Composite Engine Structures – Phase I”, *prepared for Texas Research International/U.S. Air Force*, 15 pp.

9. **Ziehl, P.**, Rizos, D., Caicedo, J., **Colmorgan, A., **Howard, R., and *Barrios, F., (2010), “Investigation of the Performance and Benefits of Self-Consolidating Concrete for Prestressed Bridge Girders”, *Final Report submitted to the South Carolina Department of Transportation,* 212 pp.

10. **Ziehl, P.**, Rizos, D., Caicedo, J., *Barrios, F., Howard, R., and **Colmorgan, A., (2009), “Investigation of the Performance and Benefits of Lightweight SCC Prestressed Concrete Bridge Girders and SCC Materials”, *Final Report submitted to the South Carolina Department of Transportation,* 182 pp.

11. Gopu, V. and **Ziehl, P.**, (2008), "Strengthening of Bridge Beams using Fiber Reinforced Polymers (FRP), Volume I: Literature Review and Selection of Strengthening Methods", *Final Report submitted to the Louisiana Transportation Research Center*, 49 pp.

12. Gopu, V., **Ziehl, P.**, and Bridge Diagnostics, Inc., (2008), "Strengthening of Bridge Beams using Fiber Reinforced Polymers (FRP), Volume II: "Design of Strengthening Systems and Load Test Results", *Final Report submitted to the Louisiana Transportation Research Center*, 55 pp.

13. **Ziehl, P.**, Rizos, D., *Liu, Z., and *Barrios, F., (2007), "GFRP Treadways for Bridging Small Gaps - Final Report", *prepared for the Army Engineer Research and Development Center*, 51 pp.

14. **Ziehl, P.**, Engelhardt, M., Schell, E., (2007), "Field Monitoring of the San Patricio County FRP Bridge - Final Report", (with assistance by T. J. Fowler), *prepared for the Texas Department of Transportation*, 142 pp.

15. **Ziehl, P.**, and Galati, N., (2007), "CLT and AE Methods of In-Situ Load Testing: Comparison and Development of Evaluation Criteria", *prepared for the ACI Concrete Research Council, CRC proposal no. 2006-42*, 40 pp.

16. **Ziehl, P.**, (2007), "SBIR Phase I: Damage Identification Algorithms for Composite Structures", *prepared for Texas Research International/U.S. Air Force*, 36 pp.

17. **Ziehl, P.,** (2006), "Health Monitoring for Condition Based Maintenance - Phase II, Army SBIR", *prepared for Texas Research International/U.S. Army,* 113 pp.

18. Rizos, D., **Ziehl, P.**, and Harrison, K., (2006), "Vanadium Steel Non-Standard (not a standard military bridge set) Fixed Bridge Case Study – Report on Phase I" (in collaboration with Stanton, T., and Morris, C.), *submitted to the Advanced Technology Institute*, 47 pp.

19. Xu, J., **Ziehl, P.**, and Barnes, R., (2005), "I-565 Bridge Monitoring – Technical Memorandum No. 2", *prepared for the Alabama Department of Transportation, Montgomery, Alabama by the Auburn University Highway Research Center*, 22 pp.

20. **Ziehl, P.** and *Chen, Y., (2005), "Effect of Temperature on the Nondestructive Evaluation of FRP Vessels: Tensile Testing of Coupons", *Final Report, prepared for NSF/UT Arlington*, 16 pp.

21. **Ziehl, P.** and Rizos, D., (2005), "Flexural Retrofit of Bridges Using CFRP Systems - Guidelines for Implementation", *prepared for the South Carolina Department of Transportation, Columbia, South Carolina*, 21 pp.

22. Rizos, D., **Ziehl, P**., Petrou, M., Harries, K., Aidoo, J., and Parlor, D., (2005), "Flexural Retrofit of Bridges Using CFRP Systems – Volume II: Bridge Slabs", *prepared for the South Carolina Department of Transportation, Columbia, South Carolina*, 173 pp.

23. Rizos, D., **Ziehl, P**., Petrou, M., Harries, K., Aidoo, J., and Quattlebaum, J., (2005), "Flexural Retrofit of Bridges Using CFRP Systems – Volume I: Bridge Girders", *prepared for the South Carolina Department of Transportation, Columbia, South Carolina*, 250 pp.

24. **Ziehl, P.**, Engelhardt, M., and Schell, E., (2005), "San Patricio County FRP Bridge – Monitoring Phase One (May 19, 20, and 21, 2004)", *prepared for the Texas Department of Transportation, Austin, Texas*, 54 pp.

25. **Ziehl, P.**, Engelhardt, M., and Schell, E., (2005), "San Patricio County FRP Bridge – Monitoring Phase Two (March 3 and 4, 2005)", *prepared for the Texas Department of Transportation, Austin, Texas*, 34 pp.

26. **Ziehl, P.**, (2004), "Health Monitoring for Condition Based Maintenance – Option Phase, Army SBIR", *prepared for Texas Research International/U.S. Army.*

27. ***Birrcher, D., and **Ziehl, P.**, (2004), “An Acoustic Emission Evaluation of Optimized Prestressed Concrete Beams”, Final Report, *prepared for the Louisiana Transportation Research Center, LTRC Project No. 04-1TU*, 45 pp.

28. **Ziehl, P.**, Lamanna, A., Myers, J., and Nanni, A., (2004), “Strengthening of Bridge Beams Using Fiber Reinforced Polymers”, *Interim Report, prepared for the Louisiana Transportation Research Center, LTRC Project No. 03-4ST*, 57 pp.

29. **Ziehl, P.** (2003), “Health Monitoring for Condition Based Maintenance - Phase I”, *prepared for Texas Research International/U.S. Army.*

30. **Ziehl, P.** and ***Bane, W., (2003), “Nondestructive Evaluation of Fiber Reinforced Polymer Bridges and Decks”, *prepared for the Louisiana Transportation Research Center, State Project No. 736-99-1137, LTRC Project No. 03-1TUL, Report No. FHWA/LA 03/376*.

31. **Ziehl, P**. and Lamanna, A., (2003), “Monitoring of the Bonnet Carre' Spillway Bridge during Extreme Overload”, *prepared for the Louisiana Transportation Research Center, State Project No. 736-99-1146, LTRC Project No. 03-6ST, Report No. FHWA/LA 03/378.*

32. **Ziehl, P.** and **Cole, T., (2002), “Finite Element Modeling of FRP Bridge, Troupsburg, New York”, *prepared for the New York Department of Transportation*.

33. **Ziehl, P.,** Cloyd, J., and Kreger, M., (1999), “Evaluation of Minimum Longitudinal Reinforcement Requirements for Reinforced Concrete Columns”, *Engineering Research Report 1473-S, Center for Transportation Research, Bureau of Engineering Research, The University of Texas at Austin*.

34. **Ziehl, P.** (1997), “Evaluation of Acoustic Waveguide”, *prepared for the National Institute of Standards and Technology*.

**PhD advisee, **MS advisee, ***Undergraduate advisee*

INVITED PRESENTATIONS

1. **Ziehl, P**., Caicedo, J., Pollock, A., Yu, J., Zarate, B., Hossain, M., Ospina, G., and Matta, F. (2013), “Prognostics of Fatigue Crack Behavior with Acoustic Emission An overview of NIST TIP at the University of South Carolina”, Acoustic Emission Working Group (AEWG)-54, Princeton, NJ, May 21-22.

2. *Barrios, F., **Ziehl, P.**, Rizos, D., and Amado, B., (2010), “Investigation and Recommendations Related to Lightweight SCC for Prestressed Bridge Girders”, *2010 Concrete Bridge Conference - Achieving Safe, Smart, and Sustainable Bridges*, February 24-26, Phoenix, Arizona.

3. **Ziehl, P.** (2009), “Update on Selected SCDOT Research Projects at U. South Carolina”, *12th Annual SCDOT/ACEC-SC Fall Meeting*, Columbia, South Carolina.

4. **Ziehl, P.**, (2007), “Evaluation of Existing Structures through Load Testing”, *ASCE South Carolina Section, Annual Fall Seminar*, September 14, Columbia, South Carolina.

5. **Ziehl, P.**, Rizos, D., and Caicedo, J., (2007), “Investigation of the Performance and Benefits of SCC for Prestressed Girders”, *Joint Meeting of the Precast/Prestressed Concrete Institute (PCI) and the South Carolina Department of Transportation (SCDOT)*, June 20, Columbia, South Carolina.

6. *Chen, Y., **Ziehl, P.**, Fowler, T., and Engelhardt, M., (2007), "Design Methodology and Ultimate Capacity of a Hybrid FRP/RC Bridge System", *Polymer Composites Conference IV (PCC IV)*, March 20-22, Morgantown, West Virginia.

7. **Ziehl, P.**, Galati, N., and Tumialan, G., (2006), "CLT and AE Methods of In-Situ Load Testing: Comparison and Development of Evaluation Criteria", *presented to ACI Committee 437: Strength Evaluation of Existing Concrete Buildings,* November 6, Denver, Colorado.

8. **Ziehl, P.**, (2006), "Nondestructive Evaluation of Structural Systems", *Commercializing USC Engineering Technologies: Putting USC Discoveries into the Marketplace,* November 3, Columbia, South Carolina.

9. Rizos, D., **Ziehl, P.**, and Howard, R. (2006), "Investigation of Self-Consolidating Concrete for Prestressed Bridge Girders in South Carolina", *ACPA 4th Annual South Carolina "Count on Concrete" Conference,* October 4, Columbia, South Carolina.

10. Caicedo, J., Rizos, D., and **Ziehl, P.**, (2006), "Long Term Bridge Monitoring: Overview and Research Possibilities", *presented to SCDOT*, November 8, Columbia, South Carolina.

11. **Ziehl, P.**, (2006), "Structural Health Monitoring of an Efficient Hybrid FRP/Reinforced Concrete Bridge System", *presented to ACI Committee 440-J: Stay-in-Place Forms*, ACI Spring Convention, March 27.

12. **Cole, T., Lopez, M., and **Ziehl, P.**, (2006), "Nondestructive Evaluation of Fatigue Damage to Full-Scale FRP Honeycomb Bridge Specimen", *2006 NDE Conference on Civil Engineering, the 7th Structural Materials Technology (SMT) and the 6th International Symposium on NDT in Civil Engineering*, August 14-18, St. Louis, Missouri.

13. *Chen, Y., and **Ziehl, P.**, (2005), "Effect of Temperature on the Nondestructive Evaluation of FRP Vessels (Tensile Specimens)", *presented to DUPONT and DOW Chemical,* December 15, Houston, TX.

14. Rizos, D., **Ziehl, P.**, Caicedo, J., *Howard, R., *Liu, Z., (2005), "Investigation of Self-Consolidating Concrete for Prestressed Bridge Girders using South Carolina Materials", *presented at the Workshop on Self-Consolidating Concrete sponsored by Georgia/Carolinas PCI*, December 1, Charlotte, NC.

15. **Ziehl, P.** (2004), "Nondestructive Assessment of FRP Strengthened Concrete Beams", *National Academy of Building Inspection Engineers, Fourteenth Annual Meeting,* New Orleans, Louisiana.

16. **Ziehl, P.**, (2002), "Recent Applications of Fiber Reinforced Polymers for the Transportation Infrastructure", *Louisiana Transportation Research Conference*, Baton Rouge, Louisiana.

17. **Ziehl, P.** (2001), "Fiber Reinforced Polymers for Improvements to the Transportation Infrastructure", *Tulane Engineering Forum*, New Orleans, Louisiana.

**PhD advisee, **MS advisee*

ADDITIONAL PRESENTATIONS

1. Fasl, J., *****ElBatanouny, M., Larosche, C., Jones, M., and **Ziehl, P**., (2014), 'Using Acoustic Emission to Detect ASR Growth", *ACI Spring Convention*, Reno, Nevada, March 23 - 27.

2. *Abdelrahman, M., *ElBatanouny, M., and **Ziehl, P.,** (2014), "Acoustic Emission Damage Assessment and Pattern Recognition Analysis for Prestressed Concrete Structures", *ASNT 23rd Research Symposium*, Minneapolis, MN, March 24-27.

3. Larosche, C., **Ziehl, P.,** and West, J., (2014), "Using Acoustic Emission to Detect ASR Growth", *ACI Strategic Development Council*, Atlanta, Georgia, February 21.

4. Tian, Z., Yu, L., *ElBatanouny, M., and Ziehl, P., (2013), "Dual Mode Sensing on Grout Structures with Piezoelectric Sensors", *9th International Workshop on Structural Health Monitoring 2013*, Stanford University, Stanford, CA, September 10-12.

5. *ElBatanouny, M., **Ziehl, P.,** Aich, N., *Zohhadi, N., Saleh, N., and Matta, F., (2013), "Recent Developments Towards Creating Sustainable Infrastructures", *InnoVenture 2013 Conference*, Greenville, SC, May 8-9.

6. Vélez, W., *ElBatanouny, M., *Mangual, J., Matta, F., and **Ziehl, P.,** (2013), "Corrosion Monitoring of Prestressed Concrete Bridges Using Acoustic Emission", *ACI Spring Convention*, Minneapolis, April 14 –18.

7. *ElBatanouny, M., Di Benedetti, M., **Ziehl, P.,** and Nanni, A., (2013), "Condition Assessment of Concrete Members. Load Testing Procedure and Results", *ACI Spring Convention*, Minneapolis, MN, April 14-18.

8. *ElBatanouny, M., *Larosche, A., **Ziehl, P.,** and Yu, L., (2013), "Wireless Monitoring of in Situ Decommissioning of Nuclear Structures using Acoustic Emission", *ACI Spring Convention*, Minneapolis, MN, April 14-18.

9. *ElBatanouny, M., *Mangual, J., and Ziehl, P., (2012), "Damage Classification during Cyclic Load Test of Prestressed Concrete Girders using Acoustic Emission", *ACI Fall Convention 2012*, Toronto, ON, Canada. October, 2012.

10. *Larosche, A., Ziehl, P., (2012), "Damage Evaluation of Prestressed Piles Connected to CIP Bent Caps Using Acoustic Emission". *ACI Fall Convention 2012*, Toronto, ON, Canada. October, 2012.

11. *ElBatanouny, M., *Mangual, J., *Vélez, W., Ziehl, P. and Matta, F., (2012), "Early Detection of Steel Corrosion in Concrete Using Acoustic Emission", *NACE Eastern Area Conference 2012*, Princeton Junction, New Jersey, October 7-12, 2012.

12. *Larosche, A., *Mangual, J., *ElBatanouny, M.K., *Velez, W., Ziehl, P., Matta, F., (2012), "Evaluation of Prestressed Concrete Structures using Acoustic Emission: An overview of NIST TIP at the University of South Carolina", *AEWG Conference*, Princeton, NJ. May 2012.

13. Liu, A., **Ziehl, P.**, and *Larosche, A., (2011), "The Connection Behavior of Precast Prestressed Piles to Precast Bent Caps", *American Council of Engineering Companies (ACEC), 14th Annual Meeting and Trade Show, (October 26, 2011),* Columbia, South Carolina.

14. Ramirez, G., **Ziehl, P.**, and Fowler, T.**,** (2010), "Hybrid FRP/Concrete Bridges – Design and Nondestructive Evaluation", *ACI Fall Convention (October 24-29, 2010),* Pittsburgh, Pennsylvania*.*

15. Ozevin, D., Inman, D., Nanni, A., and **Ziehl, P.**, (2010), "Overview of 5-Year NIST Technology Innovation Program: *Self-Powered Wireless Sensor Network for Structural Health Prognostics", TRB 89th Annual Meeting (January 10-14, 2010).*

16. *Larosche, A., **Sweigart, S., Mays, T., Caicedo, J., and **Ziehl, P.**, (2010), "Behavior of Pile to Pile-Cap Connections Subject to Seismic Forces", *2010 FHWA Bridge Engineering Conference – Highways for LIFE and Accelerated Bridge Construction*, April 8 and 9, Orlando, Florida.

17. Yu, P., **Ziehl, P.**, Zarate, B., Caicedo, J., Yu, L., Giurgiutiu, V., Metrovich, B., and Matta, F., (2010), "Quantification of Fatigue Cracking in CT Specimens with Passive and Active Piezo-Electric Sensing", *Proceedings of the SPIE*, March, San Diego, California.

18. Zárate, B., Caicedo, J., Giurgiutiu, V., Yu, L., **Ziehl, P.**, (2010), "Bayesian Finite Element Model Updating for Crack Growth", *Proceedings of IMAC XXVIII: A Conference and Exposition on Structural Dynamics*, February 1-4, 2010, Jacksonville, Florida.

19. Suma, A., Ferraro, R., Metrovich, B., Matta, F., Nanni, A., and **Ziehl, P.**, (2009), "Nondestructive Evaluation and Acoustic Emission Monitoring of RC Slab Bridge Exposed to Marine Environment", ACI Fall Convention, *Session: Current Trends in Structural Health Monitoring Systems of Concrete Structures, Part I,* New Orleans, Louisiana.

20. **Ziehl, P.** (2007), "Acoustic Emission - Civil Applications", *presented to Physical Acoustics Corporation*, January 19, Princeton Junction, New Jersey.

21. **Ziehl, P.**, Galati, N., and Tumialan, G., (2006), "CLT and AE Methods of In-Situ Load Testing: Comparison and Development of Evaluation Criteria", *presented to ACI Concrete Research Council,* November 8, Denver, Colorado.

22. Tumialan, J.., Kelly, D., Galati, N., **Ziehl, P.**, and Nanni, A., (2006), "Load Testing of Post-Tensioned Concrete Garage Slabs", *American Concrete Institute Fall Convention*, November 9, Denver, Colorado.

23. **Tanner, C., and **Ziehl, P.**, (2005), "An Evaluation of the Fatigue Behavior of High Performance Concrete Bulb-Tee Girders", *American Concrete Institute Fall Convention*, November 6-10, New Orleans, Louisiana *(not given due to Hurricane Katrina).*

24. Grimson, J., Fu, J., and **Ziehl, P.**, (2005), "Load Testing and Analysis of Three Superloads on the Bonnet Carre' Overpass (Louisiana)", *American Concrete Institute Fall Convention*, November 6-10, Kansas City, Kansas.

25. Fowler, T., McDad, P., Medlock, R., Ulloa, F., and **Ziehl, P.**, (2004), "FRP/Concrete Hybrid Bridge, San Patricio County, Texas", *The Acoustic Emission Working Group, AEWG-47*, Penn State University, Pennsylvania.

26. Fowler, T., Ativitavas, N., Ramirez, G., and **Ziehl, P.**, (2004), "Damage Based Design Criterion for ASME Section X Code Vessels", *The Acoustic Emission Working Group, AEWG-47*, Penn State University, Pennsylvania.

27. Felkel, J., Rizos, D., **Ziehl, P.**, Caicedo, J., and Schuch, G., (2004), "Structural Evaluation and Fatigue Performance of HPS 70W Bridge Girders", *FHWA Steel Bridge Conference*, San Antonio, Texas.

28. **Ziehl, P.**, and **Ridge, A., (2004), "Nondestructive Assessment of FRP Strengthened Concrete Beams", *American Concrete Institute Fall Convention*, San Francisco, California.

29. **Ziehl, P.** (2004), "Appropriateness of Knockdown Factors for the Design of Glass Fiber Reinforced Polymer Structural Components", *American Concrete Institute Spring Convention,* Washington, D.C.

30. **Ziehl, P.** (2004), “Structural Health Monitoring of the Bonnet Carre' Spillway Bridge during Extreme Overload”, *Louisiana Transportation Research Conference*, Baton Rouge, Louisiana.

31. ***Constantino, J., and **Ziehl, P.**, (2003), “Development of an Accept/Reject Criterion for Fiber Reinforced Polymer Ring Specimens”, *Louisiana Alliance for Minority Participation - Research Symposium*, New Orleans, Louisiana.

32. **Ziehl, P.**, (2003), “Finite Element Modeling and Experimental Investigation of a Full-Scale FRP Honeycomb Bridge Specimen”, *ASCE Civil Engineering Conference*, Baton Rouge, Louisiana.

33. **Cole, T. and **Ziehl, P.**, (2002), “Finite Element Modeling of an FRP Honeycomb Bridge with a Representative Volume Element Approach”, *ASCE/ACI Louisiana Civil Engineering Conference*, New Orleans, Louisiana.

34. ***Green, T. and **Ziehl, P.**, (2002), “An Experimental Study of Accumulating Damage in Fiber Reinforced Polymer Specimens”, *Louisiana Alliance for Minority Participation - Research Symposium*, New Orleans, Louisiana.

**PhD advisee, **MS advisee, ***Undergraduate advisee*

MEDIA PUBLICATIONS

- Hildebrandt, P., (2009), “Research that’s Paving the Way for Better, Safer Bridges and Work Environments”, *Concrete Construction.*

- Williams, J., (2008), “The Ongoing Evolution of FRP Bridges”, *Public Roads*, September/October, Vol. 72, No. 2 (cover and article).

RESEARCH GRANTS

1. “N122-110 Innovative Structural Health Monitoring (SHM) System Capable of Detecting, Localizing, and Characterizing Damage in Composite Aircraft Structures”, PI, November 2012 – March 2013, U.S. Navy, $22,000.

2. “Self-Powered Wireless Sensor Network for Structural Bridge Health Prognosis”, PI (U. South Carolina), February 2009 - January 2014, NIST, $1,974,000 (U. South Carolina amount; joint venture with Mistras, U. Miami, and Virginia Tech).

3. “Distributed Sensing for the Nuclear Infrastructure”, PI, May 2012 – August 2013, ASPIRE I – Track III, U. South Carolina, $13,414.

4. “Investigation of the Performance and Benefits of Deck Tee Bridge Girders for Accelerated Construction”, PI, December 2012 – November 2016, FHWA/SCDOT, $199,979.

5. “AF093-179 Built-In Damage State Detection and Localization Capabilities for Composite Engine Structures (Phase II)”, PI, January 2012 - June 2013, USAF/TRI, $129,998.

6. “In-Situ Monitoring of Precast Approach Slabs”, PI, July 2012 – December 2014, FHWA/SCDOT, $26,000.

7. “In-Situ Decommissioning Sensor Network, Meso-scale Test Bed”, PI, July 2011 - December 2011, DOE, $60,000.

8. “AF093-179 Built-In Damage State Detection and Localization Capabilities for Composite Engine Structures (Phase I)”, PI, August 2010 - December 2010, USAF/TRI, $22,938.

9. “Innovative Bridge Research and Design Project: Connections between Prestressed Concrete Piles and Precast Concrete Bent Caps”, PI, March 2010 - May 2011, FHWA/SCDOT, $150,000.

10. “Testing of T&TD Brackets”, PI, February 2010 - June 2010, Force Protection, $30,000.

11. “AF073-119: Inspection of Subsurface Flaws around Fasteners on Aircraft”, PI, June 2009 - September 2009, USAF/TRI, $20,000.

12. “Investigation of Spliced Concrete Pile Connections”, PI, December 2007 - December 2008, Sun Piledriving Equipment, LLC, $115,500.

13. “Behavior of Pile to Pile-Cap Connections Subjected to Seismic Forces”, PI, January 2008 - July 2011, FHWA/SCDOT, $491,000.

14. “Damage Identification Algorithms for Composite Structures”, PI, October 2006 - January 2007, USAF/TRI, $20,000.

15. “Sensor Fusion Approach to Structural Health Assessment”, PI, April 2006 - June 2007, University of South Carolina (USC) Research and Productive Scholarship Program, $18,000.

16. “CLT and AE Methods of In-Situ Load Testing: Comparison and Development of Evaluation Criteria”, PI, January, 2006 - March, 2007, ACI Concrete Research Council, $9,550.

17. “Concept Study – Bridging Small Gaps with Treadways”, PI, March 2006 - February 2007, US Army, $49,994.

18. “Nanocomposite Concrete Research: Graduate Student Support”, PI, March 2006 - March 2007, USC College of Engineering and Computing (CEC), $21,000.

19. “Request for Enhancement of Facilities for Competitiveness in Federally Funded Research”, PI, USC-Vice-President for Research/CEC, February 2005 - June 2006, $98,238.

20. “Investigation of the Performance and Benefits of Self Consolidating Concrete”, co-PI, May 2005 - September 2009, FHWA/SCDOT, $245,000.

21. “Investigation of the Performance and Benefits and Development of Guidelines for the Acceptance of Lightweight Self-Consolidating Concrete”, PI (February 2007 – July 2009), co-PI (September 2005 - January 2007), September 2005 – July 2009, SCDOT, $199,489.

22. “Vanadium Steel Non-Standard (not a standard military bridge set) Fixed Bridge Case Study – Phase I, II & III”, co-PI, July 2006 – June 2008, US Army/ATI (in collaboration with US Army Corps of Engineers – Engineer Research Development Center [ERDC]), Total amount = $1,283,519.
    - *Phase I: July 2005 – June 2006 (USC budget $165,000)*
    - *Phase II: July 2006 – June 2007 (USC budget $101,000)*
    - *Phase III: August 2007 - July 2008 (USC budget $120,000)*

23. “Structural Evaluation and Monitoring of a HPS 70W Steel Bridge”, co-PI, March 2003-May 2007, FHWA-IBRC program (in collaboration with SCDOT), $172,806 (assumed in 2004).

24. “Bridge Rehabilitation Using CFRP Materials”, co-PI, SCDOT, $80,000, January 2001 – April 2005 (assumed in 2004, total amount = $506,755)

25. “Optimization of High Performance Prestressed Concrete Girders”, PI, November 2003, the Louisiana Transportation Research Center (LTRC), $5,000.

26. “Repair of Cracked Prestressed Concrete Girders”, PI, September 2004–December 2008, FHWA/Auburn University, $25,000.

27. “Nondestructive Evaluation of Fiber Reinforced Polymer Vessels Designed to Act at Elevated Temperature”, PI, September 2003 - December 2004, NSF/U. Kansas, $16,893.

28. “Health Monitoring for Condition Based Assessment – Phase II SBIR”, PI, September 2004-August 2005, U.S. Army/TRI, $77,250.

29. “Strengthening of Bridge Beams using Fiber Reinforced Polymers”, PI, July 2003 - June 2005, LTRC, $199,911.

30. “Health Monitoring for Condition Based Assessment – Option Phase”, PI, November 2003 - April 2004, US Army/TRI, $6,000.

31. “Health Monitoring for Condition Based Assessment – Phase I SBIR”, PI, March 2003 - August 2003, US Army/TRI, $14,000.

32. “Monitoring of the Bonnet Carre’ Spillway Bridge during Extreme Overload”, PI, November 2002 - March 2004, LTRC, $7,636.

33. “Nondestructive Evaluation of Fiber Reinforced Polymer Bridges and Decks”, PI, July 2002 - December 2002, LTRC, $5,000.

34. “Fatigue and Shear Behavior of HPC Bulb-Tee Girders”, co-PI, June 2002 - July 2003, LTRC, $354,496.

35. “Finite Element Modeling and Nondestructive Evaluation of a Modular Fiber Reinforced Polymer Bridge System”, PI, January 2002 - July 2002, NYSDOT/KSCI, $25,689 (includes test specimen).

Additional Funding:

- “Structural Health Monitoring of the San Patricio County FRP Bridge”, Investigator, November 2003 - August 2006, TxDOT/UT Austin, $60,000 (total amount).

- “Acoustic Emission Evaluation of FRP Bridge Beams”, Investigator, January 2003 - December 2004, TxDOT/UT Austin, $9,072.

- “Fabrication and Quality Control of San Patricio FRP Bridge”, Investigator, September 2002, FHWA, $800 (travel).

ADDITIONAL RESEARCH INVOLVEMENT

- Investigator for the Tulane Institute for Macromolecular Engineering and Science (TIMES), sponsored by NASA, 2003.

- Investigator for the Tulane Research Institute for Security Engineering (RISE), sponsored by the Missile Defense Administration (MDA), 2003.

- Lead designer for an innovative hybrid FRP/reinforced concrete bridge (30 foot span, completed 2003) and consultant for a similar design (50 foot span, completed 2007). Both projects sponsored by the Federal Highway Administration.

INVENTION DISCLOSURES AND PATENT APPLICATIONS

- USCRF No. TBD (2014), *invention disclosure*
- USCRF No. 01039 (2013), *provisional patent*
- USCRF No. 00921 (2011), *invention disclosure*
- USCRF No. 00922 (2011), *patent application*
- USCRF No. 00923 (2011), *invention disclosure*
- USCRF No. 00924 (2011), *invention disclosure*
- USCRF No. 00833 (2010), *patent application*
- USCRF No. 00879 (2010), *invention disclosure*

INSTITUTIONAL SERVICE

U. SOUTH CAROLINA

- 2013 – present: *Member*, University Committee on Tenure and Promotion
- 2013 – present: *Chairman*, Department Committee on Tenure and Promotion
- 2013: *Reviewer*, National Science Foundation
- 2013: *External Advisor*, Gilbert Middle School robotics team
- 2013: *Reviewer*, Nuclear Energy University Cooperative (NEUP) program
- 2012: *Seminar Coordinator and Lecturer*, "Fundamentals of Reinforced Concrete Design of Hydraulic Structures", *ASDSO*, Phoenix, Arizona, and Columbus, Ohio.
- 2011: *Seminar Coordinator and Lecturer*, "Fundamentals of Reinforced Concrete Design of Hydraulic Structures", *ASDSO*, Baltimore, Maryland, and Columbia, South Carolina.
- 2009 - 2011: *Faculty Senator*
- 2009 - present: *Director*, Structures Laboratory
- 2004 - 2012: *Member*, Graduate Studies Committee
- 2008 - present: *Faculty Advisor*, Concrete Canoe Team
- 2008: *Faculty Advisor*, PCI Big Beam Team
- 2008: *Outside Reviewer,* Tenure and Promotion
- 2007: *Judge*, South Carolina Junior Academy of Science, SCAS/SCJAS Annual Meeting
- 2007: *Coordinator*, SCDOT Resident Engineer Academy (Materials Module)
- 2006: *Judge*, South Carolina Junior Academy of Science, SCAS/SCJAS Annual Meeting
- 2006: *Coordinator*, SCDOT Resident Engineer Academy (Materials Module)
- 2005 - 2013: *Undergraduate Research Advisor*: approx. five undergraduate students each year
- 2005 - present: *Mentor,* Alfred P. Sloan Foundation Scholarship Program (recruitment and retention related to under-represented PhD candidates)
- 2004 - present: *Member*, Faculty Search Committees (8 committees)
- 2004 - present: *Reviewer*, ACI, ASCE and other journals (twelve reviews per year)

TULANE UNIVERSITY

- 2001 - 2004: *Member*, Graduate Studies Committee
- 2002 - 2004: *Faculty Advisor*, ASCE Concrete Canoe Team
- 2004: *Faculty Advisor*, PCI Big Beam Team
- 2002: *Faculty Advisor*, PCI Big Beam Team

- 2001 - 2004: *Member,* Faculty Search Committees (six committees)
- 2002 - 2004: *Reviewer*, ACI, ASCE and other journals (six reviews per year)
- 2002 - 2004: *Reviewer and Panelist,* NSF and other agencies
- 2002 - 2004: *Member*, University Committee on Computing
- 2002 - 2003: *Mentor*, LS-LAMP (Louisiana Alliance for Minority Participation) Summer Internship

PROFESSIONAL SERVICE

- 2014: *Chairman*, ACI Committee 437: Strength Evaluation of Existing Concrete Structures
- 2011: *Member,* Task Group on Repair of Reinforced Concrete of Existing Nuclear Power Plants
- 2008 - 2010: *Chairman,* ACI Committee 335: Composite and Hybrid Structures
- 2010: *Panelist*, Remote Monitoring of Decommissioned Structures, U.S. Department of Energy
- 2004 - present: *Member*, TRB Subcommittee: Nondestructive Evaluation of Structures
- 2002 - present: *Voting Member*, ASME Section X: Fiber Reinforced Plastic Pressure Vessels
- 2002 - 2013: *Voting Member,* ACI Committee 437: Strength Evaluation of Existing Structures
- 2002 - 2013: *Voting Member*, ACI Committee 440-L: Durability of FRP Reinforcement
- 2002 - 2012: *Voting Member,* ACI Committee 335: Composite and Hybrid Structures
- 2003: *Vice-Chairman*, Louisiana ASCE Structures Committee