Natassia Brenkus, Ph.D.

brenkus.4@osu.edu (352) 870-7251

Teaching and Mentorship

CE4350 –Reinforced Concrete Design

- *61 students*
- *SEI cumulative* ***mean=4.4, SD=0.5*** *(20 of 61 reporting)*
- *Peer-reviewed by M. Hagenberger on October 3, 2017.*

CE5880 – Structures Graduate Student Seminar

- *16 students*
- *SEI cumulative* ***mean=4.6, SD=0.5*** *(9 of 16 reporting)*

Advisor to

- *Ph.D. – Madiha Ammari – Started Jan. 2018. Anticipated graduation Dec. 2020.*
- *M.S. – Ben Colbert – Co-advising with Lisa Burris. Started Aug. 2017. Anticipated graduation May 2019.*
- *M.S. – Kyle Ritterbeck – Started Aug. 2017. Anticipated graduation Dec. 2018.*
- *M.S. – Joey Scott – Co-advising with Anthony Massari. Started Aug. 2017. Anticipated graduation Dec. 2018.*
- *Undergraduate*
    - *Joel (3 cr.) (Summer 2017)*
    - *Vince Kampel (1 cr.) (Spring 2018)*
    - *Victor Amesoeder (3 cr.) (Spring-Summer 2018). Co-advising with Karen Dannemiller.*

<u>Personal Development in Teaching</u>

Mentee in 2017-2018 Faculty FIT Program Aug 2017 – May 2018
Program of the University Institute for Teaching and Learning
Columbus, OH

- Monthly meetings with a 4-person mentorship cohort, focused on development of teaching skills
- Online training to gain certification

Participant in 2017 PCA Professor's Workshop July 24-28, 2017
Program of the Portland Cement Association
Skokie, IL

- Week-long workshop to enhance professors' skills in teaching concrete courses.

Research AY 2017-2018

Submitted, funded

2018

Replaceable Unbonded Tendons for Post-Tensioned Bridges ***$15k of $450k***

Funded by: Florida Department of Transportation

- Investigation of fretting fatigue potential in unbonded tendons with flexible fillers;
- Investigation of deck-level venting as a source of moisture intrusion.
- Students: (1) PhD student (French fellowship) and (1) Master's student (self-funded)

Trajectories of Structural Health of Concrete Bridges in Louisiana's Disappearing Coastal Wetlands ***n/a (invited researcher)***

Funded by: The Louisiana Universities Marine Consortium

- Co-PI with Dr. Jovan Tatar, Univ. of Louisiana at Lafayette
- LUMCON Exploratory Research Grants

Ohio Department of Transportation Research-On-Call ***$450k of $900k (potential)***

Funded by: The Ohio Department of Transportation

Students: none to-date

Residential Health: Fungal Growth Affecting Structural Strength in Post-Hazard Environments

Funded by: Start-up. Intend to submit to National Science Foundation.

Students:

- (2) Master's students (one partially funded via start-up and partially via U.S. Navy, one funded by U.S. Army) and (2) undergraduate students (one mentored Spring 2018 by myself; one co-mentored with Dr. Dannemiller since January 2017 through current)

Submitted, pending

2018

Funder: Federal Highway Administration Requested $777k

Title: "Advancing Alternative Cementitious Materials for Use in Highway Bridge Structures"

Program: Exploratory Advanced Research Program No. 693JJ3-18-BAA-0001

Role: Co-PI with Lisa Burris

Other Collaborators: Dr. Lisa Burris (OSU, CEGE); Dr. Kimberly Curtis with Georgia Tech University; Dr. Tyler Ley with Oklahoma State University

Funder: Louisiana Transportation Research Center Requested $100.6k

Title: "Investigating State-of-the-art Technology for Determining Needed Information for Bridge Rating Strategies"

Role: Sub-consultant to University of Louisiana at Lafayette

Collaborators: Dr. Jovan Tatar with University of Louisiana at Lafayette

Funder: Institute for Materials Research, Internal Requested $2.5k
Title: "Evaluation of fungal growth in household products"
Role: Co-investigator. Dr. Karen Dannemiller (OSU, CEGE) is PI.
Collaborators: Marcia Nishioka, Senior Research Scientist, Civil, Environmental and Geodetic Engineering (Analytical chemistry and public health) Chad Rappleye, Associate Professor, Microbiology (Fungal biology & image expertise) Thomas Mitchell, Professor, Plant Pathology (Fungal growth and plant pathology)

Submitted, unfunded

2018

Ohio Department of Transportation $47.8k
Title: Evaluation of Effective Bridge Deck Repair Maintenance Methods
Role: Co-PI with Lisa Burris (OSU, CEGE) and Dr. Qian Chen (OSU, FABE)

Funder: National Academies of Sciences, Engineering and Medicine $40k
Title: "Bridge Demolition Construction Practices and Management"
Program: National Cooperative Highway Research Program (NCHRP) Synthesis Program

Mentored Student Submissions for Funding

2018

Funder: The Ohio State University College of Engineering
COE Undergraduate Summer Research Program (USRP) 2018
Student: Victor Amesoeder $3.5k for student, unfunded
Co-mentoring with Dr. Karen Dannemiller

Funder: The Ohio State University Office of Undergraduate Research and Creative Inquiry
Undergraduate Research Apprenticeship Program (URAP) 2018
Student: Victor Amesoeder $4k for student, unfunded
Co-mentoring with Dr. Karen Dannemiller

White Papers

2018

Topic: Post-Hazard Fungal Growth in Residential Structures: Residential Health
Collaborators: Dr. Karen Dannemiller (OSU, CEGE), Dr. Thomas Mitchell (OSU, Department of Plant Pathology) and Dr. David Prevatt (University of Florida, Department of Civil Engineering)

- Submitted to National Science Foundation program directors (seeking home)

Joy Pauschke, Ph.D., P.E. - Program Director
Engineering for Civil Infrastructure (ECI)
Division of Civil, Mechanical and Manufacturing Innovation (CMMI)
Directorate for Engineering (ENG)

Grace Yuan, Ph.D., P.E. - Program Director
Engineering for Civil Infrastructure (ECI)
Division of Civil, Mechanical and Manufacturing Innovation (CMMI)
Directorate for Engineering (ENG)

Karl Rockne, PhD, PE, BCEE
Program Director
Environmental Engineering Program
Division of Chemical, Bioengineering, Environmental, and Transport Systems

- Submitted to National Science Foundation's NHERI facility (seeking collaborators)
  Arindam Gan Chowdhury, PhD
  PI and Director, NHERI Wall of Wind (WOW) Experimental Facility (EF)
  Co-Director, Lab. Wind Engineering Research, Extreme Events Institute, an FIU Preeminent Program
  Professor, Dept. of Civil & Environ. Engineering
  Florida International University

Topic: Chloride Intrusion through Deck-Level Vent Ports
Collaborators: Dr. Lisa Burris (OSU, CEGE)

- Submitted to The Post-Tensioning Institute, unsolicited
- Sent to several industry partners, unsolicited
- Gathering field data and industry donations to support a graduate student's work-in-progress while continuing to seek funding.

Peer Reviewed Publications

Brenkus, N.R., Tatar, J., Hamilton, H.R., and Consolazio, G.R. "Simplified Finite Element Modeling Of Post-Tensioned Concrete Members with Mixed Bonded and Unbonded Tendons," El Sevier Engineering Structures, **accepted Apr. 2018**, currently editing.

Brenkus, N.R., Bhatia, R., Potter, W.A., and Hamilton, H. R. "Mock-up Injections of Flexible Filler Materials for Multi-strand Post-Tensioning Tendons," *PCI Journal*, **May-Jun.2018.**

Tatar, J., **Brenkus, N.R.,** Subhash, G., Taylor, C. and Hamilton H.R. **"**Characterization of adhesive interphase between epoxy and cement paste via Raman spectroscopy and mercury intrusion porosimetry," Cement and Concrete Composites, **Jan. 2018.**

Brenkus, N.R., Hamilton, H.R., and Potter, W.A. "Flexural Strength and Hinge Behavior of Internally Post-tensioned Members with Mixed Bonded and Unbonded Tendons, " Post-Tensioning Institute Journal, **Dec. 2017.**

Abdullah, A.B.M., Rice, J.A., Bhatia, R. **Brenkus, N.R.**, and Hamilton, H. R. "Unbonded Tendons as an Alternative for Bonded Tendons in Post-Tensioned Bridges: Constructability, Structural Performance, and Monitoring," Structures Congress 2017. Conference Paper. **Apr. 2017.**

Brenkus, N.R., Wagner, D.J., and Hamilton, H. R. "Experimental Evaluation of Flexural Static and Fatigue Strength of an Innovative Splice for Prestressed Precast Concrete Girders," *ASCE Journal 6*

Brenkus, N.R., Wagner, D.J. and Hamilton, H. R. "Experimental Evaluation of Shear Strength of an Innovative Splice for Prestressed Precast Concrete Girders," *ASCE Journal of Bridge Engineering,* **2016**.

Abdullah, A.B.M., Rice, J.A., **Brenkus, N.R.**, and Hamilton, H. R. "Full-Scale Experimental Investigation of Wire Breakage Detection in Deviated Multi-Strand Tendon Systems," *Journal of Civil Structural Health Monitoring,* **2015**.

Brenkus, N.R., and Hamilton, H. R. "A Field-spliced Prestressed Joint to Extend Spans of Simply Supported I-girders" *Precast/Prestressed Concrete Institute Conf. Proceedings,* **2014**.

Brenkus, N.R., and Hamilton, H. R. "Proposed Minimum Steel Provisions for Prestressed and Nonprestressed Reinforced Sections," *ACI Structural Journal,* **2014**.

Other Publications

Brenkus, N.R., Abdullah, A.B.M., Bhatia, R., Hamilton, H. R., and Rice, J.A. "Replaceable Unbonded Tendons for Post-Tensioned Bridges," Report for the Florida Department of Transportation, **2018**. (Available at www.dot.state.fl.us/structures/structuresresearchcenter/CompletedResearch).

Tatar, J., Lisek, M., **Brenkus, N.R**., and Hamilton, H.R. "Durability Evaluation of Florida's FRP Composite Reinforcement for Concrete Structures," Report for the Florida Department of Transportation, **2017.** (Available at www.dot.state.fl.us/structures/structuresresearchcenter/CompletedResearch).

Bhatia, R., **Brenkus, N.R.**, Hamilton, H. R. and Rice, J.A. "Replaceable Unbonded Tendons for Post-Tensioned Bridges – Task 1 Interim Report," Interim Report for the Florida Department of Transportation, **2015**. (Available at www.dot.state.fl.us/structures/structuresresearchcenter/ CompletedResearch).

Brenkus, N.R. and Hamilton, H. R. "Long Spans with Transportable Precast Prestressed Girders," Report for the Florida Department of Transportation, **2013**. (Available at www.dot.state.fl.us/structures/structuresresearchcenter/CompletedResearch).

Presentations

"Fatigue Testing of Unbonded Tendons with Flexible Fillers," Annual Convention of the Post-tensioning Institute, Minneapolis, MN, **May 8, 2018.**

"Fatigue Testing of Unbonded Tendons with Flexible Filler," Transportation Research Board, Presentation to Committee on Concrete Bridges. Washington, D.C., **Jan. 10, 2018.**

"From Grout to Flexible Filler: Post-tensioning Changes in Florida," Presentation to the Ohio Department of Transportation. Columbus, OH. **March 24, 2017.**

"Behavior and AASHTO-LRFD Design of Mixed Bonded and Unbonded Components," Transportation Research Board, Presentation to Committee on Concrete Bridges. Washington, D.C., **Jan. 9, 2017.**

"Unbonded Multi-strand Tendons in Post-tensioned Bridges: Structural Testing," Transportation Research Board, Presentation to Committee on Concrete Bridges. Washington, D.C., Jan. 11, 2016.

"Flexural Testing of Internal Post-Tensioning Tendons with Flexible Filler Materials," American Concrete Institute Fall Convention: Research-in-Progress Session, Denver, CO, Nov. 9, 2015.

"Unbonded/Waxed Tendon Research for Florida DOT," American Segmental Bridge Institute Annual Convention, Dallas, TX, Nov. 3, 2015.

FDOT Structures Research Update – presentation to Florida Department of Transportation (sponsor) on research project BDV31-977-15, Tallahassee, FL, Aug. 5, 2015.

"Injection of Post-Tensioning Tendons with Flexible Filler Materials," American Concrete Institute Spring Convention: Research-in-Progress Session, Kansas City, MO, Apr. 13, 2015.

FDOT Structures Research Update – presentation to Florida Department of Transportation (sponsor) on research project BDV31-977-15, Tallahassee, FL, Aug. 11, 2014.

"Large Scale Structural Testing of Long Spans with Transportable Precast Prestressed Girders," Precast/Prestressed Concrete Institute and National Bridge Conference, Nat'l Harbor, MD, Sept. 8, 2014.

"Unbonded Tendons with Alternative Post-tensioning Filler Materials," Post-Tensioning Institute Annual Convention, Norfolk, VA, May 5, 2014.

"Unbonded Tendons with Alternative Post-tensioning Filler Materials," American Concrete Institute Fall Convention: Research-in-Progress Session, Reno, NV, Mar. 24, 2014.

FDOT Structures Research Update – presentation to Florida Department of Transportation (sponsor) on research project BDK75 977-30 "Long Spans with Transportable Precast Prestressed Girders", Tallahassee, FL, Aug. 7, 2013.

"Long Spans with Transportable Precast Prestressed Girders – Research-in-Progress," Structures Graduate Student Seminar, University of Florida, Gainesville, FL Nov. 28, 2012.

FDOT Structures Research Update – presentation to Florida Department of Transportation (sponsor) on research project BDK75 977-30, Tallahassee, FL, Aug. 2, 2012.

FDOT Structures Research Update – sponsor presentation on research project BDK75 977-30

Service and Membership

Departmental Service:

- Lab Renovations of 119, 130 and 050 – Ad-hoc committee — Jan 2017-current
- Structures Curriculum Updating – Ad-hoc committee — Dec 2017-current
- Member of the Undergraduate Studies Committee — Jan 2018 – current

Moderator for Ohio Transportation Engineering Conference Committee — Mar 2017– current

- State (Ohio)
- Committee member – selection of topics for annual conference
- Conference session organizer and moderator
- 2017-current

Member of fib - Committee 8 (Concrete Durability) — Jan 2017 – current

- International
- Committee member
- Secretary of sub-group to re-write Bulletin 33 (state-of-the-art document on post-tensioning tendon system durability)

Member of American Concrete Institute

Committees 123 (research and development) and — Mar 2018-current
Committee 423 (prestressed) — 2016-current

- National – largest professional service organization. Writes concrete building code.
- Committee member for 123 (Research and Development) and 423 (Prestressed Concrete)
- Moderator and organizer for Open Topics sessions at bi-annual conference

Member of National Academies of Sciences, Engineering and Medicine, Transportation Research Board, Standing Concrete Bridge Committee AFF30

Jan 2016-current

- National – professional service group that guides research interests in my field at the federal funding level
- Voting Committee member

Member of Post-tensioning Institute Committee M-50 Multi-strand Tendons 2017-current

- National – most specialized professional service group related to my research

Workshop presenter with American Segmental Bridge Institute. May 2017-current

- National audience wherein research findings are directly distributed to practicing engineers.
- Annual workshop is conducted over 2 days with field demonstrations in Tallahassee, FL

Reviewer for

- National Academies' Journal of the Transportation Research Board – 3 submissions AY 17-18
- ASCE's Journal of Bridge Engineering – reviewed 0 submissions AY17-18
- Post-tensioning Institute Journal – reviewed 2 submissions A17-18

Faculty Representative at Autumn 2017 ASAP meeting December 21, 2017

Graduate Faculty Representative – Final Defense - Entymology March, 30, 2017

Exhibitor at COSI STEM Expo Feb 25, 2017

Education

Doctor of Philosophy in Civil Engineering December 2016
University of Florida | Gainesville, FL
Advisor: H.R. Hamilton III

Master of Engineering in Civil Engineering, with thesis December 2013
University of Florida | Gainesville, FL
Advisor: H.R. Hamilton III

Bachelor of Science in Civil Engineering December 2006
University of Florida | Gainesville, FL

Experience

Assistant Professor Jan. 2016-current

The Ohio State University | Columbus, OH

Graduate Research Assistant Jan. 2010-Dec. 2016

University of Florida | Gainesville, FL

Replaceable Unbonded Tendons for Post-Tensioned Bridges

- Designed and supervised the construction of laboratory set-ups to evaluate new materials for post-tensioned bridge construction, including a 200-ft long mock-up for injections of flexible (non-cementitious) post-tensioning tendon filler materials;
- Developed, designed, and assisted in construction of full-size prestressed concrete beams to evaluate structural behavior (flexural static and fatigue) of bridge girders (requiring knowledge of the AASHTO-LRFD Design Specifications, FDOT Specifications, ACI, AISC and PTI codes and/or design manuals);
- Collaborated with FDOT structures research staff in an investigation of different injection procedures on constructability and relative tendon fill when using flexible fillers;
- Direct project management and coordination of research group.

Long Spans with Transportable Precast Prestressed Girders

- Developed, designed, constructed and load-tested (shear, flexural static, and fatigue) a new prestressed splice connection for long-span precast prestressed concrete girders;
- Responsible for coordinating and supervising construction and laboratory testing with the FDOT Structures Research Lab.

Structures Research Lab Intern Jan.-Dec. 2012; Apr.-Aug. 2014; Apr.-Aug. 2015

Marcus H. Ansley Structures Research Center | Tallahassee, FL

- Directed lab staff in the execution of experimental work related to graduate projects;
- Assisted in construction and instrumentation of a variety of research projects;
- Developed procedures and assisted in construction of pumping equipment for injection of flexible fillers for post-tendons.

Design Engineer Jan. 2007-Dec. 2009

Commercial Metals Co. (formerly SMI Joist and Deck) | Gainesville, FL and Starke, FL

- Designed SJI-certified steel joists and girders, coordinating with EORs, steel erectors, detailers, and shop personnel;
- Designed field repairs and coordinated their implementation with jobsite crews;
- Performed jobsite visits for product and weld inspections.

Engineering Intern May 2005-Dec. 2006

SMI Joist and Deck | Gainesville, FL

Technical Qualifications

E.I. License # # 1100011530
Bonded Post-Tensioning Level 1 Certification
Unbonded Post-Tensioning Level 1 Certification