Fray F. Pozo-Lora, Ph.D.

Postdoctoral Research Associate

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Research Interests

Precast/prestressed concrete. FRP-reinforced concrete. Structural mechanics. Reliability analysis and code development. Resilient Communities. Eco-friendly construction materials. Sustainable construction. Digital fabrication with concrete.

Education

2019–2021 **Ph.D. in Engineering - Construction Engineering & Management**, *GPA: 4.00*
Durham School of Architectural Engineering and Construction, The University of Nebraska – Lincoln
Dissertation: "Flexural & Bond Performance of Pre-Tensioned Beams Reinforced with 1.125-inch Diameter Prestressing Strands."
Advisor: Dr. Marc Maguire
Committee Members: Dr. Jay Puckett, Dr. George Morcous, and Dr. Jiong Hu.

2016–2019 **Ph.D. in Civil & Environmental Engineering – Structural (Incomplete)**, *GPA: 3.88*
Civil & Environmental Engineering Department, Utah State University
Advisor: Dr. Marc Maguire
Committee Members: Dr. Paul J. Barr, Dr. Andrew D. Sorensen, Dr. Marvin W. Halling, and Dr. Thomas Fronk.

2016–2018 **M.S. in Civil & Environmental Engineering – Structural**, *GPA: 3.80*
Civil & Environmental Engineering Department, Utah State University
Thesis: "On Thermal Bowing of Concrete Sandwich Wall Panels with Flexible Shear Connectors."
Advisor: Dr. Marc Maguire
Committee Members: Dr. Joseph Caliendo and Dr. Paul Barr.

2009–2014 **Civil Engineer Diploma – Cum Laude (5-year cycle without thesis)**, *GPA: 86.8%*
Civil Engineering Department, Universidad Autonoma de Santo Domingo (Dominican Republic)
Senior Design Project: Structural Design and Detailing of a Metal Building for Industrial Facilities.

Research Experience

2023–Present **Postdoctoral Research Associate**
Durham School of Architectural Engineering and Construction, The University of Nebraska – Lincoln
Supervisor: Dr. Marc Maguire
- Current Project (NDOT): High-Mast Tower Foundation – Phase II.
- Project 1 (Dominican Republic Government): Developing safety factors for concrete structures in the Dominican Republic.

2019–2021 **Graduate Research Assistant**
Durham School of Architectural Eng. and Construction, The University of Nebraska – Lincoln
Supervisor: Dr. Marc Maguire
- Project 1 (PCI): Development of a PCI standard test method for the determination of performance of partially composite wythe connectors.
- Project 2 (private): Long-term monitoring of deformations of the cast-in-place reinforced concrete slabs.

2016–2019 **Graduate Research Assistant**
Civil & Environmental Engineering, Utah State University
Supervisor: Dr. Marc Maguire
- Project 1 (Ph.D. Dissertation): Bond Performance of 1-1/8 Inch Diameter Prestressing Strands.
- Project 2 (M.S. Thesis): On Thermal bowing of concrete sandwich wall panels with flexible shear connectors.

Publications

Publications in refereed journals and magazines

6. Luebke, J., **Pozo-Lora, F. F.**, Al-Rubaye, S., & Maguire, M. (2023). Out-of-Plane Flexural Behavior of Insulated Wall Panels Constructed with Large Insulation Thicknesses. *Materials*, 16(11), 4160. https://doi.org/10.3390/ma16114160.

5. McRory, J. W., **Pozo-Lora, F. F.**, Benson, Z., Tawadrous, R., & Maguire, M. (2022). Behavior of Hybrid Reinforced Concrete Bridge Decks Under Static and Fatigue Loading. *Polymers* 14, no. 23: 5153. https://doi.org/10.3390/polym14235153.

4. **Pozo-Lora, F. F.**, & Maguire, M. (2022). Determination of the Mechanical Properties of Flexible Connectors for Use in Insulated Concrete Wall Panels. *JoVE (Journal of Visualized Experiments)*, (188), e64292, https://doi.org/10.3791/64292.

3. Maguire, M., & **Pozo-Lora, F. F.** (2020). Partially Composite Concrete Sandwich Wall Panels: What is "percent composite"? *Concrete International*, 42(10), 47–52. Link to article.

2. **Pozo-Lora, F.**, & Maguire, M. (2020). Thermal bowing of concrete sandwich panels with flexible shear connectors. *Journal of Building Engineering*, 29, 101124. https://doi.org/10.1016/j.jobe.2019.101124.

1. Cox, B., Syndergaard, P., Al-Rubaye, S., **Pozo-Lora, F. F.**, Tawadrous, R., & Maguire, M. (2019). Lumped GFRP star connector system for partial composite action in insulated precast concrete sandwich panels. *Composite Structures*, 229, 111465. https://doi.org/10.1016/j.compstruct.2019.111465.

Publications in preparation or under review

- **Pozo-Lora, F.F.**, Maguire, M., Sorensen, A.D., Halling, M.W., & Barr, P.J. Benchmarking Bond of 19-wire 28.6mm Diameter Prestressing Strands to Normal-Weight Concrete. (Under review: ASCE Journal of Materials in Civil Engineering).
- **Pozo-Lora, F.F.**, Maguire, M., Sorensen, A.D., Halling, M.W., & Barr, P.J. Transfer and Development Length of 28.6-mm Diameter Grade 1720 Strands. (Under review: ASCE Journal of Bridge Engineering).

Publications in refereed conference proceedings

5. Al-Maabreh, A., **Pozo-Lora, F. F.**, & Maguire, M. (2023). Design of wythe connectors for out-of-plane loading of insulated walls. 2023 PCI Convention at The Precast Show. Columbus, OH. 1-14.

4. Awawdeh, A., **Pozo-Lora, F. F.**, & Maguire, M. (2023). Inter-wythe slip design criteria for non-composite insulated walls. 2023 PCI Convention at The Precast Show. Columbus, OH. 1-23.

3. **Pozo-Lora, F. F.**, Al-Rubaye, S., & Maguire, M. (2021). Parametric Study of Pre-Tensioned Girders Reinforced with 19-Wire 1-1/8" Diameter Prestressing Strands. 2021 PCI/NBC, 1–15.

2. **Pozo-Lora, F. F.**, & Maguire, M. (2019). Flexural Behavior of Continuous Non-Loadbearing Insulated Wall Panels. 2019 PCI/NBC, 1-15.

1. Tavakoli, R., Echols, A., Pratik, U., Pantic, Z., **Pozo, F.**, Malakooti, A., & Maguire, M. (2017). Magnetizable concrete composite materials for road-embedded wireless power transfer pads. 2017 IEEE Energy Conversion Congress and Exposition, ECCE 2017, 2017/1. https://doi.org/10.1109/ECCE.2017.8096705

Technical reports & white papers

8. Poudel, U., Allerheiligen, C., **Pozo-Lora, F. F.**, & Maguire, M. (2023). Testing of Recycled Plastic Lumber. University of Nebraska – Lincoln. (Research Report – FIRSTSTAR Recycling)

7. **Pozo-Lora, F. F.**, Tahat, M., Awawdeh, A., Al-Rubaye, S., & Maguire, M. (2023). Development of a PCI Standard Test Method for Determination of Performance of Insulated Wall Panel Wythe Connectors. University of Nebraska – Lincoln. (Research Report – PCI.)

6. **Pozo-Lora, F. F.**, Al-Rubaye, S., & Maguire, M. (2022). Long-Term Monitoring of Cast-in-place Reinforced Concrete Slab Deformations. University of Nebraska – Lincoln. (Research Report – Owens Corning Co.)

5. **Pozo-Lora, F. F.**, & Maguire, M. (2021). Designing GFRP-Reinforced Tilt-up Wall Panels. University of Nebraska – Lincoln. doi:10.32873/unl.dc.oth.011.

4. **Pozo-Lora, F. F.**, Benson, Z., & Maguire, M. (2020). Insulated Wall Panel Connection Testing and Analysis. University of Nebraska – Lincoln. (Research Report – ATMI Precast.)

3. McRory, J. W., **Pozo-Lora, F. F.**, Benson, Z., & Maguire, M. (2020). Structural Fiber Reinforcement to Reduce Deck Reinforcement and Improve Long-Term Performance, MPC-20-413. Link to report.

2. **Pozo-Lora, F. F.**, Benson, Z., Maguire, M., Sorensen, A. D., Haling, M., & Barr, P. J. (2020). Bond Performance of 1.125 Inch Diameter Prestressing Strands. Link to Report

1. **Pozo-Lora, F.** & Maguire, M. (2019). Thermal Bowing Testing of Precast Concrete Sandwich Wall Panels. Civil and Environmental Engineering Faculty Publications. Paper 3621. Link to Report.

Conference and congress presentations

3. **Pozo-Lora, F. F.** & Taveras-Montero, M.A. (2022). Development of the Resistance Factors for the Dominican Republic Code of Concrete Structures. UASD International Research Congress.

2. **Pozo-Lora, F. F.** (2021). Parametric Study of Pre-Tensioned Girders Reinforced with 19-Wire 1-1/8" Diameter Prestressing Strands. 2021 PCI Convention - Innovations in Precast Concrete Components.

1. **Pozo-Lora, F. F.** (2019). Flexural Behavior of Continuous Non-Loadbearing Insulated Wall Panels. 2019 PCI/NBC, 15.

Honors and Awards

2022 **Outstanding Teacher**
Civil Engineering School, Ibero-American University, Santo Domingo, Dominican Republic.

2016–2018 **Ministry of Higher Education, Science & Technology Master's Scholarship**
Awarded US$65,905 of merit-based funding to study a master's degree at Utah State University.

Grant Writing Experience

2023 **Statistical Review of Round Robin Test Data Developed for PAF in Concrete.**
- Role: Wrote the entire proposal without the budget.
- PI: Marc Maguire; Co-PI: Brennan Bean.
- Budget: $40,000.

2019-2022 **Development of a PCI Standard Test Method for Determination of Performance of Insulated Wall Panel Wythe Connectors.**
- Role: Provided preliminary finite element analysis data, developed the figures, and helped draft the proposal.
- Funded by the Precast Concrete Institute (PCI).
- PI: Marc Maguire.
- Final Budget: $192,497.

2019-2023 **Developing Safety Factors for concrete in the Dominican Republic.**
- Role: Proposal Draft Preparation. Reviewed and formatted the proposal to comply with the funding agency standards. Translated the proposal into Spanish for submission.
- Funded by the Precast Concrete Institute (PCI).
- PI: Manuel Taveras; Co-PI: Marc Maguire.
- Final Budget: $131,245.

Advising Experience

2023–Present **Remote MS Thesis Advisor**, Autonomous University of Santo Domingo
Studemts and Projects:

- **Roberto Mejia**: Risk and Reliability of Prescriptive Formwork Assemblies in the Dominican Republic (2023–Present).
- **Franklin Lora**: Behavior and Design of Deep Z-Sections for Cold-Formed Composite Floor Systems (2023–Present).
- **Emmanuel Reyes**: Analytical Study on the Performance of Bridge Girders Reinforced with 28.6mm combined with 12.7mm diameter Strands in UHPC (2023–Present).
- **Joel Feliz**: Non-linear behavior of insulated wall panels (2023–Present).
- **Tyana V. Perez**: Study and Proposal of a Management System to Optimize the Bridge Maintenance. Case Study: Juan Pablo Duarte, Matías Ramón Mella, Francisco Del Rosario Sánchez and Juan Bosch Bridges in Dominican Republic (2021–2023).

Teaching Experience

2023 Graduate Instructor, Universidad Autonoma de Santo Domingo
Santo Domingo de Guzman, Distrito Nacional, Dominican Republic.
Numerical Methods Workshop (One time).

2021–2023 Undergraduate Instructor, Pontificia Universidad Catolica Madre y Maestra
Santo Domingo de Guzman, Distrito Nacional, Dominican Republic.

- **Structural Analysis I**: taught four times.
- **Structural Analysis II**: taught once.
- **Reinforced Concrete Structures II**: taught once.
- **Bridge Design**: taught once.
- **Structural Dynamics**: taught once.

2021–2023 Undergraduate Instructor, Universidad Iberoamericana
Santo Domingo de Guzman, Distrito Nacional, Dominican Republic.

- **Mechanics of Deformable Solids I**: taught twice.
- **Mechanics of Deformable Solids II**: taught once.
- **Structural Analysis I**: taught once.
- **Structural Analysis II**: taught once.
- **Reinforced Concrete Structures I**: taught once.
- **Formwork Systems**: taught once.
- **Structural Dynamics**: taught once.

Industry Experience

2021 - 2022 **Structural Engineering Consultant**
Freelance consulting in the Dominican Republic (remote)
Santo Domingo, Dominican Republic.

- Offered structural design consultancy to engineering firms on general structural design.
- Trained engineers and students in the use of commercial finite element software.

2015 - 2016 **Structural Design Engineer**
Taveras Ingenieria & Servicios
Santo Domingo, Dominican Republic.

- Designed more than 30 masonry, concrete, and steel structures for high seismic loads ($S_s = 1.55g$ and $S_1 = 0.75g$) and high wind loads (v =160-190 mph), implementing ACI 530-13, ACI 318-14, and ANSI/ASIC 360-10 and 358-10.
- Evaluated structures following Dominican and American regulations.
- Indicated details for draftspersons for proper detailing of structures.

2014 - 2015 **Project Engineer**
JCM & Asociados, Ingenieros Civiles
Santo Domingo, Dominican Republic.
- Designed more than 20 masonry, concrete, and steel structures for high seismic loads ($S_s = 1.55g$ and $S_1 = 0.75g$) and high wind loads (v =160-190 mph), implementing ACI 530-13, ACI 318-14, and ANSI/ASIC 360-10 and 358-10.
- Detailed building components following engineering firm templates.
- Evaluated structures following Dominican and American regulations.

Service

2023 Service to the American Concrete Institute (Dominican Republic Chapter)
Position: Vice-President
- Organize continuing education activities for dissemination of knowledge of concrete.
- Translate papers for ACI Concrete International.
- Participate in the ACI Convention representing the chapter.

2022-2023 Research Proposal Reviewer for the Ministry of Higher Education, Science & Technology of the Dominican Republic.
- Have reviewed and rated eight(8) proposals in the broad area of construction systems, architectural engineering, and civil engineering.

2021–2022 Service to the Ibero-American University
Bachelor Level:
- Member of the American Concrete Institute (ACI) Faculty Network.
- Advising capstone students on aspects pertaining to structural design.
- Advising students in the EERI seismic design competition.

2022–Present Journal Peer Reviewer:
- Taylor & Francis: One (1) time.
- MDPI: Four (4) times.

Software Skills

Software CAD & BIM: AutoCAD & REVIT.
Finite Element Analysis: CSi ETABS, SAFE, & SAP2000.
Structural Design: ASDIP Retain, Eriksson Wall, LECWALL.
Other: Adobe Illustrator, Adobe Lightroom, MS Office, LaTeX.

Programming Excel VBA, Python, **R**.

Computation MATLAB, MathCAD, and Smath Studio.

Professional/Academic Societies

Since 2022 Faculty Member of The Masonry Society.

Since 2021 Member of the American Concrete Institute: Faculty Network; Vice-president of the Dominican Republic Chapter.

Since 2019 Member of the National Career of Researchers of the Ministry of Education, Science & Technology of the Dominican Republic. Career Number: 0724

Since 2016 Member of the Precast Concrete Institute.

Since 2015 Professional Engineer (License #33939), Dominican College of Engineers, Architects, and Land Surveyors (CODIA, acronym in Spanish.)

Languages

Spanish	Native
English	Professional Working Experience
Portuguese	Can understand sentences and frequently used expressions related to areas of most immediate relevance.

References

References will be made available upon reasonable request.