

Carlos R. Lopez, Ph.D., P.E.

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Primary Areas of Consulting

- **Structural Evaluations**
 - Concrete, steel, timber or masonry residential
 - Light-frame commercial & residential multi-family buildings
 - Code compliance
 - Roofing systems
- **General Damage Assessment**
 - Wind design evaluation and damage assessment
 - Wind-driven rain damage assessment
 - Building envelope and water ingress evaluations
 - Post storm damage assessment
 - Hail-caused damage assessment

Professional Licensure

Registered Professional Engineer: State of Texas #119200 – Granted 2014
State of Florida #81045 – Granted 2016

Work Experience

Haag Engineering Co.
Associate Engineer 2012 to Present

Education

Doctor of Philosophy in Civil Engineering 2011
Dissertation Title:
Measurement, Analysis and Simulation of Wind-Driven Rain
University of Florida Gainesville, Florida

Master of Engineering with a major in Civil Engineering 2009
Emphasis on Structures
Thesis Title:
Comparison of Wind-Driven Rain Test Methods for Residential Fenestration
University of Florida Gainesville, Florida

Bachelor of Science in Civil Engineering 2007
Emphasis on Structures
University of Florida Gainesville, Florida
Graduated Cum Laude

Professional Memberships & Activities

American Society of Civil Engineer (ASCE).

Research Experience

Haag Engineering

Jan 2012 to Present

Irving, Texas

- Designed and developed a wind simulator machine capable of generating wind speeds up to 150 MPH for testing the response or resistance of products & materials to wind forces.
- Designed and developed a pressure chamber capable of pressures up to 200 psf for testing the response or resistance of products & materials to wind forces and wind-driven rain.
- Designed and developed a portable pressure chamber capable of testing the uplift resistance of roofing products.

University of Florida

Dec 2007 to Dec 2011

Gainesville, Florida

- Designed and constructed an articulating instrumentation platform capable of accurately measuring rain and wind characteristics in extreme wind events.
- Developed a numerical, Reynolds number dependent, wind-driven rain model to aid in the full-scale simulation of wind-driven rain.
- Designed the full-scale, wind-driven rain simulator for the Institute for Business & Home Safety Research Center.
- Developed a morphological image processing algorithm to measure raindrop-size distributions using photographic data.
- Designed and led construction of a residential structure to test residential components and cladding systems in hurricane force wind and rain.
- Designed and led construction of multiple residential roof specimens to test shingle and roof tile behavior.
- Participated in The Verification of the Origins of Rotation in Tornadoes Experiment 2 by collecting wind-driven rain data in super-cell thunderstorms during a six week field campaign in the southern and central Plains of the United States.
- Participated in the Florida Coastal Monitoring Program by deploying portable weather stations to collect ground level meteorological observations and leading a team in conducting post-storm damage assessment surveys.
- Investigated fenestration test methods through a series of experiments that examined full scale wall/window specimens subjected to simulated wind-driven rain scenarios under the oversight of a task force that included representatives from product manufacturing, homebuilding, architecture, engineering, code development and test laboratories.

Publications

Lopez, C.R., Masters, F.J. and S. Bolton, 2011. *Water Penetration Resistance of Residential Window and Wall Systems Subjected to Steady, Rapid Pulsed and Fluctuating Wind Load Pressures*. Building and Environment, 46, 1329-1342.

Friedrich, K., Kalina, E., Masters F.J., Lopez, C.R. *Particle size distributions in supercell Thunderstorms measured by optical disdrometers during VORTEX2*. Monthly Weather Review.

Friedrich, K., Higgins, S., Masters, F.J., Lopez, C.R. *Effects of Strong Winds on PARSIVEL Disdrometer Measurements*. Journal of Atmospheric and Oceanic Technology.

Friedrich, K., Higgins, S., Masters, F.J., Lopez, C.R. *Articulating and Stationary PARSIVEL Disdrometer Measurements in Conditions with Strong Winds and Heavy Rainfall*. Journal of Atmospheric and Oceanic Technology, 30, 2063–2080

Conference Proceedings

Lopez, C.R., J.J. Vaccaro, F.J. Masters and J.D. Katsaros, “*Comparison of Severe Wind-Driven Rain Rain Test Methods for Fenestration*,” 1st American Association for Wind Engineering Workshop, Vail, Colorado, August 20-22, 2008.

Lopez, C.R., F.J. Masters and K. Friedrich “*Capture and Characterization of Wind-Driven Rain During Tropical Cyclones and Supercell Thunderstorms*,” 13th International Conference on Wind Engineering, Amsterdam, The Netherlands, July 10-15, 2011.

Goode, J.S. and C.R Lopez. “*Asphalt Composition Shingle Wind Damage Assessment with Full-Scale Test Assemblies*” PLRB/LIRB Claims Conference & Insurance Services Expos, Boston, Massachusetts, March 17-20, 2013.

Lopez, C.R., F.J. Masters and R.W. Booker “*Moisture Mitigation & Protecting the Building Envelope*” PLRB/LIRB Claims Conference & Insurance Services Expos, Indianapolis, Indiana, March 17-19, 2014

Seminars & Lectures

Contributing author and regular presenter of the following continuing education seminars:

- Metal Roofs: Damage Assessment* – 2 hours
- Haag Certified Inspector – Residential Roofing* – 20 hours
- Haag Certified Inspector – Commercial Roofing* – 20 hours
- Haag Certified Inspector – Wind Damage* – 20 hours