



Luis A. Mariaca, M.S., P.E.

Consulting Civil- Structural Engineer

Mr. Mariaca has over 25 years of engineering experience involving failure analyses, damage evaluations, project construction supervision, structural design, structural certification, and building code compliance evaluations. He has conducted full-scale structural load testing evaluations for structural certifications. Mr. Mariaca's experience includes investigations of numerous building collapses, structural failures involving overload, modeling, materials and design issues, and including several cases located overseas. His expertise includes analysis in the areas of structural performance, soil-structure interaction, soil consolidation and settlement, construction evaluations and materials testing. Practice areas also include cause and scope of damage assessment from impact, vibration, fire, wind and flooding. Mr. Mariaca is a licensed commercial general contractor and residential builder.

Education

- PhD Candidate – Structural Engineering; Emphasis: Soil-Structure Interaction, 2009. University of South Carolina, Columbia, South Carolina
- Post-graduate Studies; University of South Carolina, Columbia, South Carolina, 1986-1996.
- Masters of Science in Structural Engineering, Bradley University, Peoria, Illinois, 1983.
- Bachelors of Science in Civil Engineering, Bradley University, Peoria, Illinois, 1980.

Registrations

- Professional Engineer: Virginia, Georgia, Texas, Mississippi, South Carolina, North Carolina, Tennessee, Florida, Louisiana, Connecticut.
- Licensed General Contractor: South Carolina.
- Pilot Instrument Rating Certificate: Federal Aviation Administration.
- National Council of Examiners for Engineering and Surveying: #15214.

Languages

- Fluent in English, French and Spanish (spoken and written)

Principal Areas of Practice

- Structural
- Geotechnical
- Catastrophe Investigation
- Roofing
- Moisture Migration

Professional Organizations

- Chi-Epsilon National Honor Society
- National Society of Professional Engineers (SC Young Engineer of the Year, 1990)
- South Carolina Society of Professional Engineers (Past Columbia Chapter President, State Scholarship Chairman)
- International Code Council, Inc.
- American Institute of Steel Construction
- Aircraft Owners and Pilots Association
- American Society of Civil Engineers
- American Concrete Institute

Publications & Lectures

- Analysis of the Failure of a Steel Smoke Stack, Proceedings from the American Society of Mechanical Engineering, 1997 International Mechanical Congress and Exposition, Dallas, Texas, November 16-21, 1997 (Failure Analysis and Prevention Committee).

Previous Experience

- Applied Building Sciences, Inc., Senior Project Manager, 2009 to Present. Failure analysis, damage evaluation, project construction supervision, structural design, structural certification, and building code compliance inspections. Investigation of structural failures involving overload, design analysis, construction evaluations and materials testing. Scope of damage assessments to structures from impact, vibration, fire, wind and flooding. Licensed commercial general contractor and residential builder. Construction inspection and evaluation.
- Engineering Structures, Consulting, Analysis, Design Inc., Owner & Consulting Engineer, 2002 – 2009. Specialized consultation in the areas of structural engineering and foundation systems. Technical consultation to industry and private institutions. Engineering Analysis, damage assessment and technical support. Evaluation of concrete, steel, timber and masonry structures. Industrial and commercial construction evaluations, code compliance analysis and reviews. Sensitivity analysis. Structural design, commercial and industrial projects.
- Engineering Design & Testing, Corp., Senior Structural Engineer, 1989 – 2002. Analysis of wind forces and snow drifts on existing structures, structural analysis of reinforced concrete and steel structures; building code compliance studies and structural design reviews. Structural integrity evaluations by load testing methods; laboratory and field testing of components and connections. Seismograph monitoring. Damage evaluations due to vibrations and settlement stresses. Timber truss framing analysis. Testing of truss plate connections. Ultimate load analysis of steel joist framing systems. Restoration cost analysis. Structural assessment and scope of damage evaluations.
- Post, Buckley, Schuh & Jernigan, Senior Engineer, 1984 – 1989. Project engineer and principal engineer in charge of the firm's regional structural efforts. Developed contract documents. Designed and supervised productions of drawings for industrial and municipal projects. Prepared specifications for water and waste-water treatment plants. Designed deep foundation systems. Soil load-displacement response analyses and plate load tests. Performed analytical investigations, strength evaluations, seismic analysis and code conformance studies. Coordinated review and approval of shop drawings and as-builts. Management of projects from preliminary phase through final construction.
- Bradley University, 1984. Instructor for undergraduate Engineering Dynamics course. Developed course work. Managed soils and concrete laboratories. Supervised permeability and time-rate consolidation tests.
- Bradley University, 1982 – 1983. Research assistant while enrolled as a graduate student in Masters program in Structural engineering. Performed studies on small scale structural models. Conducted model analyses and testing and developed program logarithms for design of structures.
- Wilbur Smith & Associates, Columbia, South Carolina, 1981 – 1982. Project engineer, construction supervision of \$110M Viru-Viru International Airport Project in Santa Cruz, Bolivia. Coordinated and supervised geotechnical and structural field inspections. Soil laboratory efforts. Settlement analyses, compaction, and in-place density tests. Shallow foundations bearing capacity design. Participated in review and approval of structural design documents. Load testing and deflection analysis of structures. Quality control compliance program. Translations of technical documents.

Seminars and Presentations

- “Wind versus Flood”, Annual Catastrophe Seminar, Custard Insurance, Ramada Plaza Hotel, Columbia, South Carolina, March 27-28, 2006.
- “Parametric Analysis in Structural Failure Investigation”, guest speaker ECIV 798 Graduate class, University of South Carolina, Engineering Department, March 2003.
- “Failure Analysis in Structural Applications”, guest speaker at the University of South Carolina, Engineering Department, March 2001.
- “The Use of Audio Visual Equipment in a Technical Presentation”, presented by Luis A. Mariaca, M.S., P.E., Technical Session, Annual Engineers Meeting, Charlotte, North Carolina, February 2000.
- Case Histories in Structural Failures”, guest speaker at the University of South Carolina Society of Professional Engineers Chapter, Columbia, South Carolina, April 5, 1999.
- “Damage Engineering”, Guest speaker at Civil Engineering Issues in Engineering (CIVE 490) class at University of Nebraska, Lincoln, Nebraska, December 4, 1998.
- “Analysis Techniques for Structural Failure Investigations”, Technical Session IIC, Engineering Design & Testing Corp. Annual Engineers Meeting, Columbia, South Carolina, January 30, 1998.
- “Analysis of the Failure of a Steel Smoke Stack”, American Society of Mechanical Engineering, International Mechanical Congress and Exposition, Dallas, Texas, November 18, 1997.
- “Structural Design Liability and The Use of Consultants”, South Carolina Claims Association, Myrtle Beach, South Carolina, November 1996.
- “Slope Stability in Trench Excavations”, Occupational Safety and Health Administration (OSHA), with Dr. Dimitri Rizos, Columbia, South Carolina, November 1995.
- “Fundamental Soil Properties”, Occupational Safety and Health Administration (OSHA), Columbia, South Carolina, October 1995.

Continuing Education

- Advanced Structural Mechanics/Analysis, ECIV 720, Dr. Mullen; Dissertation Preparation, ECIV 899, Dr. Rizos, USC, Columbia, SC, Spring 2011
- Structural Analysis II, ECIV 520, Dr. Rizos, USC, Columbia, SC, Fall 2010
- Building Envelope Technology, RCI Symposium, San Antonio, TX, November 8-9, 2010
- Advanced Foundation Design, ECIV 737, Dr. Gassman, USC, Columbia, SC, Spring 2010
- SEA Seminar, Columbia, South Carolina; Michael Leming – Concrete Mix Design for Structural Engineering, Chris Hewitt – 2005 AISC Seismic Provisions, July 26, 2008.
- SEAK, Inc. Seminar, James Mangravitis – Deposition of Experts, May 10, 2007.
- Quality Management, Wind Loads, ASCE 7-02 Revealed Civil Engineering – Asphalt, Failure Investigations and Forensic Engineering, Airport Pavement – Asphalt, Red Vector, Columbia, South Carolina.
- Professional Development Center, Practical Dynamic Analysis and Design for Engineers and Architects, Columbia, South Carolina, December 31, 2004.
- Design of Wood Beam-Columns with Spreadsheets, Engineered Wood Construction Guide, Columbia, South Carolina.
- American Concrete Institute, ACI Wind and Seismic Seminar, Hilton Hotel, Charlotte, North Carolina, SK Ghosh and David Fanella, November 11, 2004.
- FEMAP, Windows-based pre and post-processor for Engineering Finite Element Analysis training seminar, November 27-29, 2001.
- South Carolina Law for Design Professionals, Columbia, South Carolina, March 21, 2009.

- Futurex, Inc. – System 21 Transportation, Technical Session #1, Design/Build and the Navy, Session #2, Sizing up the metric Movement, Technical Session #3, 2000 State Convention SCSPE/CESC, Charleston, South Carolina, June 2000.
- Spoil of Evidence, Technical Session, Presented by Rodney Dean, Review of NFPA 921, presented by D. Jeff Jaco, Vibrations/Settlement Analysis, Technical Session, presented by Charles Whitley, The Use of Audio Visual Equipment in a Technical Presentation, Technical Session, presented by Luis A. Mariaca, M.S., P.E., Annual Engineers Meeting, Charlotte, North Carolina, February 2000.
- Analysis of Fatigue Fractures, presented by R. Dean Harris, Engineering Design & Testing, Corp. Annual Engineers Meeting, Charleston, South Carolina, February 1999.
- Property Loss and Liability Conference, Chicago, Illinois, April 1998.
- Analysis Techniques for Structure Failure Investigations, Technical Session IIC, Engineering Design & Testing, Corp. Annual Engineers Meeting, Columbia, South Carolina, January 1998.
- American Society of Mechanical Engineering Congress and Exposition, Failure Analysis and Prevention Committee, Dallas, Texas, November 1997.
- American Concrete Institute – the New Masonry Code Seminar, Charlotte, North Carolina, October, 1997.
- Seismic Design, University of South Carolina, Columbia, South Carolina, February 1997.
- Economical Design of Steel structures, AISC Seminar, Columbia, South Carolina, November 1996.
- The New American Concrete Institute 318 Building Code Seminar, Charlotte, North Carolina, May 1996.
- Ground Modification Seminar, sponsored by Hayward Baker, Inc., Columbia, South Carolina, March 1996.
- Speaking Out With Confidence, Daniel Management Center, College of Business Administration, University of South Carolina, Columbia, South Carolina, September 1995.
- Small Appliance Fires – Some Tips for Root Cause Investigations, presented by Steven W. Morris, Technical Session, Engineering Design & Testing, Corp. Annual Engineers Meeting, Columbia, South Carolina, February 1995.
- Writing With Confidence, Daniel Management Center, College of Business Administration, University of South Carolina, Columbia, South Carolina, March 1994.
- Twenty-Five Welding Cost Reduction concepts, sponsored by the Virginia-Carolina Structural Steel Fabricators Association, Columbia, South Carolina, October 1993.
- General Contractors Seminar, Columbia, South Carolina, February 1991.
- International School of Construction Estimating, Orlando, Florida, March 1990.
- Portland Cement Association, Structural Concrete Design Seminary, Myrtle Beach, South Carolina, October 1985.