

Exponent®
Engineering & Scientific Consulting

Sam Amoroso, Ph.D., P.E., S.E.

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Professional Profile

Sam Amoroso, Ph.D., P.E., S.E., is a licensed civil and structural engineer with over 25 years of experience that includes the analysis, design, and evaluation of transportation, building, industrial, and wastewater infrastructure. He has expertise in major transportation projects; design-build project disputes; and failure analyses of bridges, buildings, and industrial structures, including collapses, defects, distress, severe-weather damage, and material degradation, with related trial, arbitration, and deposition testimony experience.

As an Adjunct Instructor in the Civil and Environmental Engineering Department at Louisiana State University, Dr. Amoroso has taught “Mechanics of Materials” and “Introduction to Civil Engineering.”

Transportation Infrastructure Consulting

Dr. Amoroso’s experience includes designing and load rating bridges, performing independent technical reviews of new bridge designs, bridge failure analysis, roadway geometric design, retaining wall design and failure analysis, and evaluation of drainage structures. Dr. Amoroso has assisted clients with disputes related to highway, light rail, and metro systems. He has experience with projects delivered using the traditional design-bid-build method, as well as numerous design-build projects, including public-private partnerships (P3).

Building Design and Evaluations

Dr. Amoroso has designed and evaluated residential, commercial, institutional, and industrial buildings. He has assessed damage to these structure types due to wind, storm surge and waves, hail, fire, ground settlement, water intrusion, winter weather, and material degradation such as wood decay and steel corrosion. Dr. Amoroso has investigated damage caused by hurricanes affecting the U.S. Gulf Coast since 2004.

Industrial and Wastewater Treatment Systems Assessment

Dr. Amoroso has designed and evaluated equipment and piping supports and foundations at chemical manufacturing, power generation, and oil and gas facilities. He has also investigated structural failures and alleged design and construction defects at municipal and industrial wastewater treatment facilities.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Louisiana State University, 2007

B.S., Civil Engineering, Louisiana State University, 1999

Outstanding Young Civil Engineer, Louisiana Section of ASCE, 2012

Licenses and Certifications

Professional Engineer, Colorado, #0062614

Professional Engineer Civil, Florida, #67680

Professional Engineer Civil and Structural, Louisiana, #PE.0031540

Professional Engineer, Mississippi, #18371

Professional Engineer, Missouri, #2020000272

Professional Engineer, New York, #110449

Professional Engineer Civil and Structural, Oklahoma, #29136

Professional Engineer, South Carolina, #37428

Professional Engineer Civil, Texas, #105474

Professional Engineer, Virginia, #402054652

Academic Appointments

Adjunct Instructor, Louisiana State University, 2008-Present

Louisiana Board of Regents Doctoral Fellowship, Louisiana State University, 2003-2006

Prior Experience

Forte and Tablada (formerly Engensus), 2006 – 2018

Engineer II, HNTB, 1999-2003

Professional Affiliations

Director, ASCE Energy Division Executive Committee (2024-present)

Co-Chair, ASCE Task Committee on Wind Induced Forces, which is responsible for the ASCE guide publication, *Wind Load Design for Petrochemical and Other Industrial Facilities* (2005-2011, 2018-2020, 2025-present)

Co-Chair, ASCE/PIP Task Committee for On-Shore Modularization, which published the guide, *Structural Design of Modules for Energy and Industrial Facilities* (2018-2024)

ASCE Task Committee that developed the guide publication, *Engineering Investigations of Hurricane Damage* (2012-2014)

ASCE Baton Rouge Branch: Program Director (2012-2013), Education Director (2008-2012), LSU Practitioner Advisor (2007-2011)

Publications

Ghahremani, K, Amoroso, SD., Bailey, JR, "Hurricane Damage to Residential Structures: Wind Damage Overview," Proceedings, ASCE Forensic Engineering Conference, October 2024.

Amoroso, A, Jampole, E, and Morgan, T. "Tornado effects on buildings: are target performance objectives consistent with recent damage observations?" Structure Magazine. July 2022.

Jampole, E., Amoroso, S., Morgan, T. and McDonald, B., "Themes in design/build disputes, from a technical expert witness perspective," Construction Law International, International Bar Association, Vol. 17, No. 1, March 2022.

Amoroso, S. D. and Gurley K. R. "Chapter 5: Response of Structures to Wind, Storm Surge, Flood, and Waves," Engineering Investigations of Hurricane Damage: Wind versus Water, edited by Peraza, Coulbourne and Griffith, American Society of Civil Engineers, Reston VA, 2014.

Wong, S., Sepaha, A., Swamy, N., Amoroso, S., and Naqvi, D., "Wind loads on non-building structures using ASCE 7-10," proceedings of the ASCE/SEI 2012 Structures Congress, Chicago, March 2012.

Amoroso, S. and Levitan, M., "Wind loads for high-solidity open-frame structures," Wind and Structures, an International Journal, V. 14, No. 1, 2011.

Amoroso, S., Hebert, K., Levitan, M., "Wind tunnel tests for mean wind loads on partially clad structures," Journal of Wind Engineering and Industrial Aerodynamics, V. 98, No. 12, pp. 689-700, December 2010.

Amoroso, S., Levitan, M., "Wind Load Analysis Uncertainty for Petrochemical Structures," 11th Americas Conference on Wind Engineering, San Juan, Puerto Rico, June 2009.

Amoroso, S., "Benefit Cost Analysis for Wind Hazard Mitigation," Louisiana Civil Engineer, Journal of the Louisiana Section of the American Society of Civil Engineers, v. 17, no. 3, May 2009.

Amoroso, S., and Levitan, M., "Recent Research for Wind Loads on Petrochemical Structures," Proceedings of the ASCE/SEI 2009 Structures Congress, Austin, TX, April 2009.

Amoroso, S. and Fennell, J., "A Rational Benefit/Cost Approach to Evaluating Structural Mitigation for Wind Damage: Learning 'the Hard Way' and Looking Forward," Proceedings of the ASCE/SEI 2008 Structures Congress, Vancouver, B.C., April 2008.

Amoroso, S. and Coco, R., "Effective Forensic Engineering Investigations of Hurricane 'Wind vs. Water' Disputes: Techniques and Tools," Proceedings of the ASCE/SEI 2008 Structures Congress, Vancouver, B.C., April 2008.

Amoroso, S. and Levitan, M., "Recent research into wind loads on industrial structures," 12th International Conference on Wind Engineering, Cairns, Australia, July 2007.

Amoroso, S., Hebert, K., Levitan, M., "Wind tunnel tests on partially clad buildings and structures," 4th European and African Conference on Wind Engineering, Prague, July 2005.

Amoroso, S., Levitan, M., "Influence of Framework and Equipment Interaction on the Wind Loads for Open-Frame Structures," 10th Americas Conference on Wind Engineering, Baton Rouge, May 2005.

Levitan, M., Qiang, L., Amoroso, S., "Wind tunnel Tests on Open-Frame Industrial/Petrochemical Structures," Proceedings of the Fifth International Colloquium on Bluff Body Aerodynamics and

Applications, Ottawa, July 2004.

Presentations

“Design Build Projects: Finished Fast, Fought Faster,” Louisiana Association of Defense Counsel, May 12, 2025.

“Black Swans: Structural and Mechanical Failures out of the Blue,” Louisiana Association of Defense Counsel, June 15, 2022.

“The Human Element: Poor Judgement and Interesting Failures,” Louisiana Association of Defense Counsel, Napa, CA, April 21, 2022.

“Texas Department of Insurance Expert Panel,” Farm Bureau Actuarial Conference, New Orleans, LA, August 7, 2018.

"Update on ASCE Guidelines, 'Wind Loads for Petrochemical and other Industrial Structures'," ASCE/SEI Structures Congress, Ft. Worth, TX, April 20, 2018.

Amoroso, S., "Seismic Design Basics for Buildings," Louisiana ASCE Spring Conference, Shreveport, LA, April 2013.

Amoroso, S., "Recent Updates to the Seismic Design Requirements for Buildings in Louisiana," Louisiana Civil Engineering Conference and Show, Kenner, LA, September 2012.

Amoroso, S., and VanDreumel, B., "The Development of Insurance Premium Discounts for Wind Hazard Mitigation," Louisiana Civil Engineering Conference and Show, Kenner, LA, September 2009.

Amoroso, S. and Coco, R., "Wind Hazard Mitigation," Southern Farm Bureau Actuarial Conference, Baton Rouge, LA, July 2009.

Amoroso, S., "Benefit Cost Analysis for Wind Hazard Mitigation," Louisiana Civil Engineering Conference and Show, Kenner, LA, September 2008.

Amoroso, S., "Determining Building Wind Loads Using ASCE/SEI 7-05: An Overview," National Hurricane Conference, Orlando, FL, March 2008.

Amoroso, S., "Recent research on wind loads for petrochemical structures," Louisiana Civil Engineering Conference and Show, Kenner, LA, September 2006.

Amoroso, S., "Wind loads on open-frame petrochemical structures," Louisiana Civil Engineering Conference and Show, Kenner, LA, September 2004.

Project Experience

Transportation Infrastructure Consulting

- Performed engineering design and construction phase services for multi-level urban highway interchanges in San Antonio, Austin, and Houston, Texas, and Kansas City, Missouri.
- Performed pre-award engineering design for a new 90-mile toll road in Texas to be delivered as a design-build project.

- Designed replacements for structure-mounted overhead sign supports on a Mississippi River bridge in Louisiana. Project included measuring in situ bridge vibrations and the development of new fatigue-resistant details.
- Performed independent technical reviews of bridge designs for design-build projects in Louisiana.
- Designed Lake Pontchartrain Causeway bridge widening in Louisiana.
- Evaluated the load-carrying capacity of multiple bridges in Louisiana (load rating).
- Investigated the cause of the collapse of a new pedestrian bridge over a highway in Florida that resulted in multiple fatalities.
- Investigated alleged contributions to flooding from reconstruction of a freeway in Louisiana.
- Investigated the causes of abutment rotations for multiple bridges along a highway in Texas.
- Investigated the scope of repair for a bridge that was struck by an oversized load in Louisiana.
- Evaluated allegations of design errors/omissions by a design-build engineering design subcontractor, altered design scopes, and altered construction scopes related to two new urban metro systems in the Middle East, including tunnels, viaducts, and deep underground, at grade, and elevated stations.
- Evaluated allegations of design errors/omissions by design-build engineering subcontractors for large urban freeway reconstruction projects in California, Colorado, and Texas, for a highway interchange reconstruction project in South Carolina, and for a light rail facility in Canada.

Building Design and Evaluations

- Performed engineering designs of new locations, renovations, and expansions of residential, retail, medical, office, church, and institutional buildings in Louisiana.
- Investigated structural failures in a new multi-story steel-framed library building in Louisiana
- Investigated the collapse of a multi-story steel and concrete-framed hotel building under construction in Louisiana that resulted in multiple fatalities.
- Investigated excessive deflections of balconies in new multi-story concrete-framed residential building in Colorado.
- Evaluated alleged design and construction defects at student housing complexes in Missouri and Louisiana, a university library in Louisiana, a new hospital in Missouri, and an apartment complex in Louisiana.
- Evaluated allegations of design errors/omissions for a large data center in Utah that was delivered as a design-build project.
- Investigated alleged impacts of storm water improvement construction on numerous adjacent residential structures in Louisiana.
- Investigated the causes of lateral movement and distress in an institutional building in Colorado.
- Investigated damage to numerous commercial, institutional, industrial, and residential structures reportedly caused by severe weather events, including hurricanes, wind, flood, hail, and ice.

Industrial and Wastewater Treatment Systems Assessment

- Designed equipment supports and foundations at midstream oil and gas facilities in Louisiana, Texas, and New Mexico.

- Designed equipment supports for a gas metering station at a new power plant in Texas.
- Designed repairs and modifications to structures supporting equipment, piping, and cables in a chemical plant in Louisiana.
- Evaluated the adequacy of an existing pile foundation to support a new tank at a chemical plant in Louisiana.
- Evaluated the design of tall, slender vertical vessels and their susceptibility to wind-induced vibrations and fatigue at a petrochemical plant in Europe.
- Evaluated allegations of design errors/omissions for a large wastewater treatment plant expansion in California.
- Investigated the cause of a baffle wall failure in an aeration basin in a wastewater treatment plant in Louisiana.
- Investigated the cause of collapse for an anaerobic digester at a manufacturing plant in Louisiana.
- Investigated alleged construction defects for a wastewater treatment plant expansion at a slaughterhouse in Texas.
- Investigated alleged design and construction defects related to headworks structures and a trenchless excavation at two wastewater treatment plants in Texas.

Risk Analysis

- Probabilistic analysis to determine how wind-resistant mitigations or construction according to updated codes and standards on residential structures affect vulnerability to damage during hurricanes. The project supported an insurance company's Louisiana regulatory submission in which they proposed premium discounts for certain interventions.
- Evaluation of hurricane wind and flood risk for a hospital in Louisiana.
- Development of hurricane evacuation planning decision framework for nursing homes in Louisiana, considering facility vulnerability, storm forecast characteristics, and storm forecast uncertainty.
- Probabilistic analysis to determine the degree of wind damage to residential structures that may have occurred before they were completely destroyed by storm surge and waves. This project supported the development of Texas Department of Insurance regulations applicable to the Texas Windstorm Insurance Association.

Advisory Appointments

Advised a technical committee of the LA State Uniform Construction Code Committee regarding proposed state exceptions or modifications to the seismic provisions of the International Building Code (2011-2012)

Peer Reviews

Journal of Building Engineering, Elsevier B.V.