

Fari Barzegar, Ph.D., P.E.
Founding Principal



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PROFESSIONAL PROFILE

Dr. Barzegar is a registered professional engineer providing a broad range of services in civil/structural engineering to insurance companies, law firms, utilities, hi-tech and mining industries, governmental and educational institutions, engineering and architectural firms, as well as individuals. With over 20 years of experience in consulting, design, construction project management, university teaching and research, Dr. Barzegar has provided clients with structural analysis and design, engineering forensic investigations, failure simulation & reconstruction using finite element stress & thermal analysis, expert testimony, and research and development support.

Projects have included analysis of buildings, bridges, power plant cooling towers and offshore platforms subjected to earthquakes and extreme winds, floor vibrations, damage investigations of single and multi-family residential buildings, retaining walls, foundations, storage tanks and underground water conduits, grain silos, blast in underground coal mines and chemical plants, effect of pile driving on adjacent buildings, distress in pavements and evaluation of construction materials, slip, trip & fall injuries, flooding damage to historic buildings, construction defects and failures during construction.

AREAS OF EXPERTISE

- Expert Witness; Insurance Claims (Analysis, Preparation); Peer Reviews
- Civil & Structural Engineering; Residential, Commercial & Institutional Building Design & Construction; Historic Buildings
- Condition Assessment of Bridges, Foundations, Sanitary Structures, Retaining Walls, Conduits & Pipelines, Roads, Slabs, Pavements, Concrete & Repair Materials
- Construction Defects & Accidents; Repair & Retrofit; Standards of Care
- Code Compliance; Seismic Resistant Design; Errors & Omissions
- Concrete, Steel, Wood, Masonry & Adobe Structures; Diagnostic & Failure Analysis
- Vibration, Blast, Impact, Earthquake, Wind, Fire, Hurricane & Flood Damage
- Effect of Pile Driving on Existing Facilities; Cracking & Settlement Damage
- Due Diligence & Forensic Investigations
- Slip, Trip & Fall Injuries
- Finite Element Dynamic, Stress & Thermal Analysis (Linear & Nonlinear); Product Design; Failure Reconstruction
- Intellectual Property & Patent Infringement

CREDENTIALS AND PROFESSIONAL HONORS

Ph.D. (Civil/Structural Engineering), University of Illinois at Urbana-Champaign, 1987
M.S. (Civil/Structural Engineering), University of Illinois at Urbana-Champaign, 1983
B.S. (Civil Engineering, High Honors), University of Illinois at Urbana-Champaign, 1981
Registered Professional Engineer (Civil), State of California (Registration # C61998)

Licensed California General Contractor (B, 846888)
 Charter Member, Structural Engineering Institute of the American Society of Civil Engineers
 Chartered Professional Engineer, The Institution of Engineers, Australia (Registration #1044611)
 Member: American Society of Civil Engineers (ASCE), Structural Engineers Association of Northern California, Earthquake Engineering Research Institute, The American Concrete Institute (ACI), American Institute of Steel Construction (AISC), International Code Council, Forensic Expert Witness Association, California Preservation Foundation, The Institution of Engineers-Australia, Tau Beta Pi National Engineering Honor Society
 Member: Joint ACI-ASCE Committee 447 on Finite Element Analysis of Reinforced Concrete Structures
 Associate Member: Joint ACI-ASCE Committee 352 on Joints and Connections in Monolithic Concrete Structures
 Alfred Noble Prize of the American Society of Civil Engineers (ASCE) for a meritorious technical paper published in the Journal of Structural Engineering (1990)
 Associate Editor: Journal of Structural Engineering, ASCE (Committee on Concrete and Masonry Structures), October 1991- May 1992
 Reviewer: technical articles for the Journal of Structural Engineering (ASCE), the Structural Journal of the American Concrete Institute, and International Journal of Structural Engineering and Mechanics
 Reviewed the manuscripts of two texts on Finite Element Structural Analysis, and Fundamentals of the Finite Element Method, for West Educational Publishing
 Chair: Technical session on “Structural Shapes”, Third International Conference on Composites in Infrastructure, San Francisco, California (2002)
 Cited in Who’s Who in Science and Engineering, 3rd Edition (1996-97)
 Principal Investigator on several research grants from U.S. National Science Foundation (1988-90), Louisiana State University Council on Research (1988), Louisiana Transportation Research Center/Federal Highway Administration (1989-92), Australian Research Council (1994-95), and the College of Engineering at the University of New South Wales (1993-96)
 Supervised five doctoral dissertations and eight masters’ theses/reports (Louisiana State Univ. and the Univ. of New South Wales)
 Coordinator of Post-Graduate Research Studies, School of Civil Engineering, and a member of the Higher Degree Committee, College of Engineering, University of New South Wales (1994-95)
 Halliburton Education Foundation Faculty Development Grant, College of Engineering, Louisiana State University, 1987
 Scholarship for graduate studies, Department of Civil Engineering, University of Illinois at Urbana-Champaign (1981-86)
 Dean’s List for academic excellence (1979-81)
 Completed “Construction Management” course, Cal State East Bay SBDC, Oakland, CA, 2006
 Completed “Systems Analysis and Design” computer course, Ohlone College, Fremont, CA, 2001
 Completed “Spread-Sheets and Data Bases” computer course, TAEF College, Sydney, Australia, 1996

EXPERIENCE

Habitat Engineering & Forensics, Oakland, CA (Founding principal, 2004- present).

Practice areas: Structural analysis & design (new buildings, additions, tenant improvements, seismic retrofit); dynamic and seismic analysis of buildings, infrastructure and structural/mechanical components; Diagnostic and failure investigations; Root-cause analysis and computer simulations using finite element analysis method; Construction accidents and defects; Slip, trip and fall injury cases.

The following is a partial list of cases for which Dr. Barzegar assisted the legal counsel as an expert witness:

Partial Case List

Fong v. Mesa Development, et al.

Shayesteh v. Norwalk HOA

Bustamante v. Vu, et al.

Andrews v. The City of Livermore

Sheldon United Terminals
v. Industrial Specialists, Inc.

Judith Ireland
v. San Francisco Municipal Railway

Charleston Place v. Bron Concrete

Ewrudje v. City of Berkeley, et al.

Coakley v. Kreger, et al.;

Albert v. Frontline Inspection Services;

Crane v. Brenlar Investments;

Yen v. De Wolf Inspection Services, et al.

Gresham v. City of San Jose

Dwivedi v. Corrie Development

Town of Woodside v. Bridgman

Mohsanian v. Mahalati

ACACIA Bank v. Chan

Great American Insurance Company
v. Diablo Valley Masonry, Inc.

Besharati v.
Marin County Public Works Department

Partial Client List

ACE Westchester Specialty Claims &
Lewis Brisbois Bisgaard & Smith, LLP

The Law Offices of Friedland, Rivas & Associates

Allstate Insurance Company &
Calendo, Puckett, Sheedy & DiCorrado, LLP

Law Office of Victor M. Castro

Cox, Wootton, Griffin, Hansen & Poulos, LLP

Sheppard-Rosen Law Firm, LLC

Warda & Yonano, LLP

Law Offices of George Holland

Wilson, Elser, Moskowitz, Edelman & Dicker, LLP

O'Brien & Kelleher, LLP

Veres Reed & Veres

McCracken, Byers & Haesloop, LLP

Sweeney, Mason, Wilson & Bosomworth

Law Offices of Cary L. Dictor

Ellison, Nielsen, Knibbs, Zehe & Antas, P.C.

Kesten, Colton, Bogaards & Brandt

Zolman Construction & Development, San Carlos, CA (May- July 2004). Professional experience includes the following:

Construction Project Manager, School Modernization, Hillsborough City School District: North Elementary School, Crocker Middle School and South Elementary School

Struct-Tech Group, Inc., Berkeley, CA- Design/Build Firm (2000-2003). Professional experience includes the following projects:

- Inspection/report of damage in several buildings
- Retrofit design of damaged buildings, foundations, retaining walls & pavements.
- Walker Avenue Condominiums, Oakland, CA – Analysis and design of a 5-story building using wood, concrete and masonry materials.
- The Key Route Lofts, Emeryville, CA – Analysis and design of a 5-story work+live building using wood, concrete and steel materials.
- Emerybay Lofts, Emeryville, CA – Analysis and design of an 8-story work+live steel moment resisting framed building (with RBS connections) including 3-D seismic and pushover analyses of various design options.
- Goldin Design Office Buildings A & B, Berkeley, CA – Analysis and design of two irregular 3-story concrete buildings including 3-D dynamic spectral analyses of various design options.
- American Industrial Center, San Francisco, CA – 3-D seismic analyses of a 5-story steel moment framed building which was constructed by Struct-Tech Group.
- Seismic retrofit of an existing church, Berkeley, CA – Wood & masonry building leased by UC-Berkeley Art Museum.
- Design of several custom residential buildings in San Francisco Bay Area and Napa including Portola Valley, Palo Alto, Fremont, Hayward, Oakland, Orinda, Berkeley and Laguna Beach, CA.
- Design of a custom adobe building in Riverside, CA.

Rutherford & Chekene, San Francisco, CA (1999-2000). Professional experience includes the following major projects:

- New de Young Museum, San Francisco, CA - Sensitivity analyses of various design options for wind and seismic forces.
- Public Works Headquarters Building, Los Angeles, CA - Performance-based seismic evaluation and assessment of retrofit options for a steel moment resisting framed building damaged during the 1994 Northridge earthquake.
- Lakewood Apartment Complex, San Francisco, CA - Evaluation of seismic performance of concrete framed buildings with masonry shear walls; development of retrofit and strengthening schemes based on performance objectives.
- Fox Theatre, San Jose, CA - Analysis of retrofit options for the existing roof structure.

Exponent Failure Analysis Associates, Menlo Park, CA (1998-99). Professional experience includes the following major projects:

- Cabrini Villas, Burbank, CA: Inspection of damage to residential buildings caused by the 1994 Northridge earthquake.

- Grain Silos, Modesto, CA: Analyses of cracking in shotcrete hoppers over grade; soil-structure interaction and water intrusion issues.
- Westminster Tank, Westminster, CA: Failure investigation of a large concrete water tank, identification of causes using computer analyses and recommendations for design modifications in a new tank with similar structural attributes planned for the City of Beverly Hills, CA.
- Denver Water, Denver, CO: Inspection of burst prestressed concrete water pipes and underground conduits, material sampling and root cause analyses.
- Condea Vista Explosion, Baltimore, MD: Analyses of damage to structures and installations in the plant caused by explosion of a pressure vessel; correlation of pressure attenuation with damage indicators.

Associate Professor (tenured), School of Civil Engineering, The University of New South Wales, Sydney, Australia (1992-98). Professional experience includes the following projects:

- Protective Seals in Underground Mining: R&D project sponsored by BHP-Coal (Australia) and Tectre Industries involving design, testing and modeling of shotcrete seals and bulkheads to protect against accidental blast, fire and water intrusion.
- Structural Evaluation of Highway Bridges, Cincinnati, Ohio: Project supported by the Ohio Department of Transportation and Infrastructure Research Institute at the University of Cincinnati to instrument and analyze three highway composite bridges to predict behavior under overloads; correlation of simulated and observed performance during passage of a 350-ton trailer truck.
- Seismic Response of Offshore Steel Jacket Platforms: R&D project to investigate the dynamic behavior of medium-rise platforms under simulated ground motions.
- Three-Dimensional Nonlinear Finite Element Analysis of Concrete Structures: R&D project sponsored by the Australian Research Council to study the serviceability and ultimate behavior of reinforced and prestressed concrete connections in framed buildings.
- Strength and Ductility of High-Strength Concrete Columns: Development of analytical/numerical procedures to simulate behavior under axial loads and biaxial bending for various cross-sectional geometries and reinforcement arrangements.
- Vulnerability Assessment of a Hyperbolic Cooling Tower: Nonlinear finite element analysis to determine the effect of extreme winds and seasonal/operational temperature gradients on the ultimate response of a reinforced concrete cooling tower in Mississippi.

Assistant Professor, Department of Civil Engineering, Louisiana State University, Baton Rouge, LA (1986-91). Professional experience includes the following projects:

- Three Dimensional Finite Element Simulation of Response of Reinforced Concrete Beam-Column-Slab Connections: R&D project sponsored by the National Science Foundation involving constitutive modeling of concrete under triaxial stresses, bond between concrete and reinforcement and determination of response mechanisms and ultimate capacities.
- Engineering properties of Brittle Repair Materials: Sponsored by Federal Highway Administration and Louisiana Transportation Research Center to test and model the behavior of various concrete materials to repair rigid concrete pavements.
- Finite Element Analysis of Jointed Concrete Pavements: Sponsored by Federal Highway Administration and Louisiana Transportation Research Center to investigate the modes of failure under mechanical and thermal loading.

Selected Publications and Presentations

a. Journal/Magazine Articles

- "Three Dimensional Modeling of Concrete Structures. I: Plain Concrete," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 123(10), pp. 1339-1346, October 1997 (with S. Maddipudi).
- "Three Dimensional Modeling of Concrete Structures. II: Reinforced Concrete," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 123(10), pp. 1347-1356, October 1997 (with S. Maddipudi).
- "Influence of Local Inertia on Seismic Response of Offshore Jackets," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 123(1), pp. 52-61, January 1997 (with K. Kayvani).
- "Hysteretic Modeling of Tubular Members and Offshore Platforms," *Engineering Structures*, Vol. 18(2), pp. 93-101, February 1996 (with K. Kayvani).
- "A Study of Layering Procedures in Finite Element Analysis of RC Flexural and Torsional Elements," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 121(12), pp. 1773-1783, December 1995 (with A. Ramaswamy and G.Z. Voyiadjis).
- "Concrete Sections Under Biaxial Bending: Interactive Analysis with Spreadsheets," *Concrete International*, American Concrete Institute, Vol. 17(12), pp. 28-33, December 1995 (with T. Erasito).
- "A Post-Cracking Formulation for Nonlinear Finite Element Analysis of RC Based on Secant Stiffness," *Journal of Engineering Mechanics*, American Society of Civil Engineers, Vol. 120(12), pp. 2621-2640, December 1994 (with A. Ramaswamy and G.Z. Voyiadjis).
- "Generating Reinforcement in FE Modeling of Concrete Structures," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 120(5), pp. 1656-1662, May 1994 (with S. Maddipudi).
- "Analytical Formulation of the Biaxial Behavior of Concrete Repair Material," Discussion, *Materials Journal*, American Concrete Institute, Vol. 90(6), pp. 627-629, November-December 1993 (with K. Behfarnia).
- "Biaxial Testing of Repaired Concrete," Discussion, *Materials Journal*, American Concrete Institute, Vol. 90(5), pp. 524-528, September-October 1993 (with K. Behfarnia).
- "Nonlinear Finite Element Analysis of Plain Concrete Pavements with Doweled Joints," *Journal of Transportation Engineering*, American Society of Civil Engineers, Vol. 119(5), pp. 763-781, September-October 1993 (with C. Channakeshava and G.Z. Voyiadjis).
- "Moment Transfer and Slab Effective Widths in Laterally Loaded Edge Connections," *Structural Journal*, American Concrete Institute, Vol. 88(5), pp. 615-623, September-October 1991 (with R. Echle and M. Foroozesh).
- "Layering of RC Membrane and Plate Elements in Nonlinear Analysis," Closure, *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 117(1), pp. 299-300, January 1991.
- "Elasto-Plastic Cracking Analysis of Reinforced Concrete," Discussion, *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 117(1), pp. 292-294, January 1991.
- "Post-Cracking Analysis of RC Panels Including Tension-Stiffening," *Canadian Journal of Civil Engineering*, Vol. 17, pp. 311-320, June 1990 (with W.C. Schnobrich).
- "Analytical Investigation of RC Membrane Elements with Anisotropic Reinforcement," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 115(3), pp. 647-665, March 1989.
- "Layering of RC Membrane and Plate Elements in Nonlinear Analysis," *Journal of Structural Engineering*, American Society of Civil Engineers, Vol. 114(11), pp. 2474-2492, November 1988.

b. Chapter in Book

"Finite Element Analysis of Reinforced Concrete Structures II," Chapter 8, *Generic Problems*, J. Isenberg, ed., New York, New York, American Society of Civil Engineers, 1993, pp. 490-569 (with J. Isenberg, et al.).

c. Society/Conference Meeting Papers

- "Strength of Reinforced Concrete Sections under Eccentric Compression," Proceedings, FIP Symposium, Johannesburg, South Africa, March 1997, Vol. 1, pp. 203-211 (with W.T. Wo).
- "A Modeling Approach for 3-D Dynamic Analysis of Offshore Jackets," Proceedings, 14th Australasian Conference on the Mechanics of Structures and Materials, Hobart, Australia, December 1995, Vol. 1, pp. 88-93 (with K. Kayvani).
- "Three Dimensional Finite Element Model for Reinforced and Prestressed Concrete Structures," Proceedings, 14th Australasian Conference on the Mechanics of Structures and Materials, Hobart, Australia, December 1995, Vol. 1, pp. 278-283 (with K. Behfarnia and R.I. Gilbert).
- "Local Inertia Effects on Seismic Response of Offshore Platforms," Proceedings, International Conference on Computational Methods in Structural and Geotechnical Engineering, Hong Kong, December 1994, Vol. IV, pp. 1313-1318 (with K. Kayvani).
- "Seismic Response of Offshore Platforms: Nonlinear Finite Element Analysis," Proceedings, Australasian Structural Engineering Conference, Sydney, Australia, September 1994, The Institution of Engineers, Australia, Publication NCP No. 94/8, Vol. 1, pp. 439-444 (with K. Kayvani).
- "Finite Element Analysis of a Reinforced Concrete Cooling Tower Subjected to Wind and Thermal Loadings," Proceedings, Australasian Structural Engineering Conference, Sydney, Australia, September 1994, The Institution of Engineers, Australia, Publication NCP No. 94/8, Vol. 2, pp. 937- 942 (with R. Veysi).
- "Generic Problems in Finite Element Analysis of Reinforced Concrete Structures," Proceedings, Structures Congress, American Society of Civil Engineers, San Antonio, Texas, April 1992, pp. 951-953 (with J. Isenberg et al.).
- "3-D Finite Element Modeling of RC Columns," Proceedings, Structures Congress, American Society of Civil Engineers, San Antonio, Texas, April 1992, pp. 177-180 (with S. Maddipudi).
- "A Secant Post-Cracking Model for Reinforced Concrete with Particular Emphasis on Tension Stiffening," Proceedings, Second International Conference on Computer Aided Analysis and Design of Concrete Structures, Austria, April 1990, Pineridge Press, Vol. II, , pp. 1001-1016 (with A. Ramaswamy).
- "Modeling Tension Stiffening in Finite Element Analysis of RC Panels," Proceedings, Annual Conference of Canadian Society for Civil Engineering, Calgary, Canada, May 1988, Volume III, pp. 277-303 (with W.C. Schnobrich).
- "Skew Anisotropic Reinforcement in 2-D Reinforced Concrete Elements," Proceedings, International Conference on Constitutive Laws for Engineering Materials: Theory and Applications, Tucson, Arizona, January 1987, Elsevier Publishing Company, Vol. II, pp. 813-820 (with W.C. Schnobrich).

d. Technical Reports

- "Constitutive Models for Nonlinear Finite Element Analysis of Reinforced Concrete Structures," UNICIV Report No. R-346, School of Civil Engineering, The University of New South Wales, ISBN No. 858413132, 74 pages, July 1995.
- "A Study on the Effect of Local Inertia on Seismic Response of Steel Offshore Platforms" UNICIV

- Report No. R-340, School of Civil Engineering, The University of New South Wales, ISBN No. 858413078, 67 pages, December 1994 (with K. Kayvani).
- "Modeling of Tubular Members in Offshore Steel Jackets under Severe Cyclic Loading," UNICIV Report No. R-324, School of Civil Engineering, The University of New South Wales, ISBN No. 858412918, 51 pages, December 1993 (with K. Kayvani).
- "Engineering Properties of Brittle Repair Materials," Final Report, Louisiana Transportation Research Center, Baton Rouge, Louisiana, two parts, 712 pages, April 1992 (with G.Z. Voyiadjis et al.).
- "Final Report: Experimental Studies on Engineering Properties of Brittle Repair Materials," Louisiana Transportation Research Center, Baton Rouge, Louisiana, 124 pages, February 1991 (with G.Z. Voyiadjis and T.M. Abu-Lebdeh).
- "3-D Response of Reinforced Concrete Beam-Column- Slab Connections," 2nd Annual Report on a Research Project Sponsored by the National Science Foundation, Dept. of Civil Engineering, Louisiana State University, Baton Rouge, Louisiana, 75 pages, August 1990.
- "Report No. 2B: Engineering Properties of Brittle Repair Materials - Analytical Studies," Louisiana Transportation Research Center, Baton Rouge, Louisiana, 51 pages, June 1990 (with C. Channakeshava and G.Z. Voyiadjis).
- "Report No. 2A: Engineering Properties of Brittle Repair Materials - Experimental Studies," Louisiana Transportation Research Center, Baton Rouge, Louisiana, 25 pages, June 1990 (with G.Z. Voyiadjis and T.M. Abu-Lebdeh).
- "A Study on Edge Connections of Flat Plate Structures Subjected to Lateral Loading," Dept. of Civil Engineering, Louisiana State University, Baton Rouge, Louisiana, 157 pages, April 1990 (with R. Echle).
- "Report No. 1: Engineering Properties of Brittle Repair Materials," Louisiana Transportation Research Center, Baton Rouge, Louisiana, 21 pages, December 1989 (with G.Z. Voyiadjis and T.M. Abu-Lebdeh)
- "3-D Response of Reinforced Concrete Beam-Column- Slab Connections," 1st Annual Report on a Research Project Sponsored by the National Science Foundation, Dept. of Civil Engineering, Louisiana State University, Baton Rouge, Louisiana, 90 pages, June 1989.
- "Nonlinear Finite Element Analysis of Reinforced Concrete under Short Term Monotonic Loading," Civil Engineering Studies, SRS 530, University of Illinois, Urbana, Illinois, 137 pages (also available through University Microfilms International, Ann Arbor, Michigan, Microfilm #NF 087-11773), November 1986 (with W.C. Schnobrich).
- "User's Manual for Program ROOF," Prepared for Union Carbide Company, Department of Civil Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, 88 pages, August 1984 (with R.B. Haber).
- "Evaluation of Selected Grouts for Installation of Load Transfer Devices," Prepared for Dayton Superior Company, Department of Civil Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, 22 pages, January 1983 (with E.J. Barenberg).

Presentations

- Invited Speaker, "Generic Problems in Finite Element Analysis of Reinforced Concrete Structures," International Workshop on Finite Element Analysis of Reinforced Concrete, Columbia University, New York, June 1991.
- Presented a short course on "Bridge Dynamics," training course for bridge engineers from Vietnam, School of Civil Engineering (UNSW), 1996.
- Presented a short course on "Finite Element Method for Engineers and Scientists," Infrastructure Research Institute, Department of Civil Engineering, University of Cincinnati, 1997.