

Exponent®
Engineering & Scientific Consulting

Jon Wren, Ph.D., P.E.

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Professional Profile

Dr. Wren has over 30 years of experience in civil, geotechnical, and earthquake engineering. He provides consultation to clients on the design, construction, and performance of varied types of earth structures and structures supported directly on the ground.

Dr. Wren has extensive experience with the evaluation of retaining structures, shallow and deep foundations, embankments, natural and manmade slopes, excavations, and pipelines. Dr. Wren has deep experience with evaluations of the cause and origin of failures, construction claim evaluation, and peer review of complex structures.

Dr. Wren has investigated retaining wall and foundation performance and failures including retaining structures such as crib retaining walls, soil mix retaining walls, soil nail walls, and conventional gravity and cantilever retaining structures, and Mechanically Stabilized Earth (MSE) walls. Dr. Wren also has experience in the investigation and analysis of pipeline system performance and failure, including sanitary sewer pipelines, water supply pipelines, storm drain pipelines, irrigation pipeline systems and oil and natural gas pipeline systems and is knowledgeable about the documentation methods for operational pipeline systems. Dr. Wren has expertise in dynamic soil properties and testing, analysis of the behavior of retaining structures, slopes, foundations, and pipelines during earthquakes and has evaluated sites and structures following natural disasters, such as earthquakes and floods.

Dr. Wren has experience with urban and infrastructure construction including site characterization, deep foundations, and support of excavation analysis and design. His expertise includes deep foundation testing, excavation monitoring, groundwater monitoring and withdrawal effects, and the effects of excavations on nearby structures. He has provided peer review services for design of complex structures and activities such as nuclear power plant structures, deep excavations, retaining structures, and dewatering programs. Dr. Wren has experience with evaluating the geotechnical properties of fly ash and analyzing the performance of fly ash amended structures such as embankments and levees.

Dr. Wren has investigated and analyzed landslides on natural and man-made slopes and provided repair recommendations for slope failures. He has investigated and analyzed the factors contributing to the causes of landslides in varied geologic settings across North America, including the effects of wildfires on slope stability and erosion, flooding, and debris generation.

Dr. Wren has expertise in the behavior of expansive and collapsible soils and their effects on foundations, retaining walls, and slopes. His expertise includes investigation of structures affected by ground settlement, conducting subsurface investigations, and performing analyses of the causes of the settlement and appropriate remedial measures. He has experience with geotechnical laboratory testing including static and dynamic testing of soil and soil improvement technologies such as soil mixing, jet grouting, and compaction grouting.

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Dr. Wren has served as an Adjunct Professor and Lecturer in the Civil and Environmental Engineering Department at Stanford University, a part-time faculty member in the Department of Civil Engineering and Applied Mechanics at San Jose State University, an instructor for the U.S. Army Corps of Engineers, and a member of the Industrial Advisory Board for the University of California Los Angeles (UCLA).

Academic Credentials & Professional Honors

Ph.D., Geotechnical Engineering, Stanford University, 1994

M.S., Structural Engineering, Stanford University, 1989

B.S., Civil Engineering, University of Notre Dame, 1988

Taylor Award Recipient (Top Civil Engineering Student, University of Notre Dame), 1988

Tau Beta Pi, National Honorary Engineering Society

Licenses and Certifications

Professional Engineer Civil, California, #56284

Professional Engineer, Colorado, #PE.0045269

Professional Engineer Civil, Florida, #72838

Professional Engineer, Hawaii, #PE-11982

Professional Engineer Civil, Massachusetts, #46593

Professional Engineer Civil, Texas, #114672

Professional Engineer, Utah, #8727183-2202

Professional Engineer, West Virginia, #20861

Academic Appointments

Stanford University, Civil and Environmental Engineering Department, Adjunct Professor

Prior Experience

Civil Engineer, New Hampshire Department of Transportation, 1988

Engineering Technician, New Hampshire Department of Transportation, 1986 and 1987

Professional Affiliations

American Society of Civil Engineers (member)

Stanford University - Stanford Associate

Stanford University Alumni Association Club of Palos Verdes/South Bay (past-President, past-Vice President)

Publications

Wren J, Campbell, C, Thomas W. Remote Sensing: The Eye in the Sky Difference Maker in Engineering Expert Driven Litigation, International Association of Defense Counsel, Annual Meeting, Vancouver, British Columbia, July 10, 2024

Bona D, Wetzel, E, Wren J. Plenary 2 -- A Long-Distance Relationship That Actually Works: Remote Sensing in Engineering Expert-Driven Litigation, American Bar Association, Forum on Construction Law, 2023 Midwinter Program, San Juan Puerto Rico, February 2, 2023

Beyzaei CZ, Wren JR, Ahdi SK, Griffith M, Osteraas J. Implementing a Practice-Focused Approach to Geotechnical Post-Earthquake Damage Assessment, Geotechnical Special Publication No. 328, Geo-Extreme 2021, Case Histories and Best Practices, Selected Papers from Sessions of Geo-Extreme 2021, The Geo-Institute of the American Society of Engineers, November 7-10, 2021.

Stewart JP, Wren JR, Beyzaei C, Ahdi S. Earthquake Damage Assessment and Repair Guidelines for Residential Wood-Frame Buildings, Volume 2 – Engineering Guidelines (Chapter 5 Background Information: Geotechnical, Chapter 6 Damage Investigation: Geotechnical, Chapter 7 Damage Repair: Geotechnical), Applied Technology Council (ATC), ATC-143, CEA-EDA-02, 2020

Wren JR. The Great Chicago Flood, analysis of Chicago's 2nd great disaster. Structure Magazine, Copper Creek, Reedsburg, WI, August 2007.

Wren JR. Recent developments in post-earthquake investigations: A geotechnical perspective. Structure Magazine, Copper Creek, Reedsburg, WI, December 2006.

Stewart JP, Wren JR. Engineering guidelines for the assessment and repair of earthquake damage in residential wood frame buildings: Chapter 4, Permanent Ground Deformation During Earthquakes. CUREE Publication No. EDA-06, Version 2005-4.

Emami NK, Moncarz PD, Wren JR. Micro-biological attack on deep foundation concrete. Proceedings, 9th International Conference on Piling and Deep Foundations, Nice, France, June 2002.

Emami NK, Nicholsen A, Moncarz PD, Wren JR. Micro-biological attack on concrete—A threat to concrete infra-structure. International Conference on Forensic Engineering, A Professional Approach to Investigation, Institution of Civil Engineers, London, UK, September 28-29, 1998, Thomas Telford Publications.

Borja RI, Regueiro RA, Wren JR. Micromechanical basis of continuum models for granular media. In: Localization and Bifurcation Theory for Soils and Rocks. Adachi, T, Oka F, and Yashima A (eds), A.A. Balkema, Rotterdam, pp. 295-304, 1998.

Wren JR, Borja RI. Micromechanics of granular media Part II: Overall tangential moduli and localization model for periodic assemblies of circular disks. Computer Methods in Applied Mechanics and Engineering 1997; 141:221-246.

Borja RI, Wren JR. Micromechanics of granular media Part I: Generation of overall constitutive equation for assemblies of circular disks. Computer Methods in Applied Mechanics and Engineering 1995; 127:13-36.

Borja RI, Wren JR. Micromechanics of continuum models for granular materials. Proceedings, 10th Conference on Engineering Mechanics, Vol. 1, pp. 497-500, Boulder, CO, 1995.

Wren JR. Micromechanical macromechanical model of dense granular materials. Ph.D. Dissertation, Stanford University, 1994.

Wren JR, Borja RI. Macro- and micro-mechanical model of granular materials. Proceedings, 8th International Conference on Computer Methods and Advances in Geomechanics, pp. 731-736, Morgantown, WV, May 1994.

Borja RI, Wren JR. Discrete micromechanics of elastoplastic crystals. International Journal for Numerical Methods in Engineering 1993; 36(22):3815-3840, November.

Borja RI, Wren JR. On the bifurcation of elasto-plastic crystals during multiple slip. American Society of Civil Engineers Ninth Engineering Mechanics Conference, Texas A&M University, TX 1992.

Proceedings and Presentations

Wren J, Campbell, C, Thomas W. Remote Sensing: The Eye in the Sky Difference Maker in Engineering Expert Driven Litigation, International Association of Defense Counsel, Annual Meeting, Vancouver, British Columbia, July 10, 2024

Wren J, Bona D, Wetzel, E. Plenary 2 -- A Long-Distance Relationship That Actually Works: Remote Sensing in Engineering Expert-Driven Litigation, American Bar Association, Forum on Construction Law, 2023 Midwinter Program, San Juan, Puerto Rico, February 2, 2023

Hansen K, Wren J. Wildfires & Debris Flows, Erosion, Flooding, Smoke & Ash, etc. Complexities Arising from Wildfires, Pacific Claim Executive Association, Monterey, CA, May 8, 2019

Wren J. Escalating Complexities of Losses Arising from Wildfires, Claims and Litigation Management, Orlando, FL, March 14, 2019

Custer CS, Green RA, King GE, Wren J. Intersection of Engineering and Law: Trends, Hot Topics, and Careers, Samueli School of Engineering, University of California Los Angeles, CA, March 11, 2019

Hansen K., Wren J, Jackson D. Escalating Complexities of Losses Arising from Wildfires, Combined Claims Conference, Orange County, CA, March 6, 2019

Hansen K, Wren J, Schifrin P. “Rain, Rain Go Away” – Wildfires, Mudslides and Everything in Between, California Insurance Wholesalers Association, La Jolla, CA, January 7, 2019

Wren JR. Engineering failure. Presented to the Department of Civil, Environmental and Architectural Engineering, University of Colorado at Boulder, CO December 4, 2015.

Shaller PJ, Shrestha PL, Deardorff TL, Wren J. Post-wildfire consequences on watershed hydrology and the environment. Poster, SETAC North America 36th Annual Meeting, Salt Lake City, UT, November 1-5, 2015.

Shaller PJ, Shrestha PL, Deardorff TL, Wren J. Adverse hydrologic and ecologic impacts of wildfires in western watersheds. Proceedings, World Environmental and Water Resources Congress 2015: Floods, Droughts, and Ecosystems, Environmental Water Resources Institute of the American Society of Civil Engineers, Austin, TX, pp. 2501-2509, May 15-21, 2015.

Wren J, McGuire M, Murphy M, Below Foundation Plumbing Leaks, Investigation, Damage Assessment, Coverage Issues, Claims Conference & Insurance Services Expo, Property & Liability Resource Bureau, Anaheim, CA, March 31-April 1, 2015

Shaller PJ, Wren JR, Shrestha PL, Sama M, Doroudian M. An evaluation of post-wildfire mitigation measures on flood hazard potential in Southern California. Poster, World Environmental and Water Resources Congress 2014: Water without Borders, Environmental Water Resources Institute of the American Society of Civil Engineers, Portland, OR, 2014.

Shaller PJ, Cydzik K, Sama M, Wren JR, Shrestha P. The Station Fire revisited, projected versus realized flood impacts 2009-2013. Presented at 2013 Floodplain Management Conference, Anaheim, CA, September 4, 2013.

Shaller PJ, Cydzik K, Sama M, Wren JR, Shrestha, P. The Station Fire revisited, projected versus realized flood impacts 2009-2013. Presented at 2013 Wildland Fire Litigation Conference, Monterey, CA, April 21, 2013.

Shaller PJ, Cydzik K, Wren JR, Hamilton D, Shrestha, PL. A case study of the fire-flood sequence in Southern California. Presentation, Wildland Fire Litigation Conference, San Diego, CA, April 15-17, 2011.

Wren JR, McCann D. Epic failures. William A. and Joyce R. Bell Excellence Fund for Civil Engineering Lecture, Western Kentucky University, KY, October 5, 2010.

Wren JR, Sykora D. Seismic Stability of Earth Dams, PROSPECT Course #247 - Week-long training course for the U.S. Army Corps of Engineers, Huntsville, AL, August 31-September 4, 2009.

Wren JR, Shaller P. 2005 Landslides: Trends and observations from the trenches. California Club, Los Angeles, CA, May 11, 2005.

Wren JR, Gupta A. Seminar for the evaluation of earthquake damage, engineering issues for post-earthquake damage assessment. Presented at California Association of Independent Insurance Adjusters Seminar on The New Fair Claims Regulations & Earthquake Standards, Pleasanton, CA, February 28, 2004; Pomona, CA, March 2, 2004; and Fresno, CA, March 4, 2005.

Wren JR. Designing, constructing, and operating a failure: Observations from post-failure investigations. Presented to the Department of Civil and Environmental Engineering, University of Houston, TX, November 17, 2004.

Wren JR, Chaudhuri D. San Simeon Earthquake: Damage patterns and trends. Presented at the American Society of Civil Engineering Forensic Engineering Technical Group, Los Angeles Section, CA, September 14, 2004.

Wren JR, Suterwala S. What lies beneath: Understanding potential seismic hazards using GIS. 2003 Annual Meeting, Engineering Geology with an Altitude, Association of Engineering Geologists Conference, 46th Annual Meeting, Vail, CO, September 15-21, 2003.

Wren JR, Shekerlian S, Chaudhuri D, Shusto L. Post-disaster safety assessment program training. Co-instructor, Disaster Emergency Services Committee of Structural Engineers Association of Southern California, June 28, July 19, November 22, 2003.

Wren JR. New approaches to geotechnical issues in litigation cases. Presented at the American Society of Civil Engineering Forensic Engineering Technical Group, Los Angeles Section, 2002 Seminar, Recurring Cases and Issues in Forensic Engineering Practice, CA, May 10, 2002.

Wren JR, Garrett J. The art and science of forensic engineering. Symposium in the Department of Engineering, Western Kentucky University, KY April 20, 2001.

Wren JR. Investigating engineering mishaps and disasters. Presented at Graduate Student Seminar Series in Selective Topics in Structures and Mechanics, Department of Civil and Environmental Engineering, University of California Los Angeles, CA, March 6, 2001.

Wren JR. Condition of America's infrastructure. Presented to the Annual Meeting of the Inland Marine Underwriters Association (IMUA), Seattle, WA, June 1998.

Wren JR. Geotechnical failures. Presented to the Geotechnical Group, Department of Civil and

Environmental Engineering, University of Massachusetts, Amherst, MA, March 7, 1997.

Wren JR. Geotechnical failures. Presented at the Structures and Geomechanics Seminar Series, Department of Civil Engineering, Stanford University, CA, February 12, 1997.

Wren JR. Macro- and micro-mechanical model of granular materials. 8th International Conference on Computer Methods and Advances in Geomechanics, Morgantown, WV, May 1994.

Advisory Appointments

University of California - Los Angeles (UCLA), Civil and Environmental Engineering Department, Industry Advisory Board (IAB) Member