

Macan Doroudian, Ph.D., P.E., G.E.
Managing Engineer

Professional Profile

Dr. Macan Doroudian is a Managing Engineer in Exponent's Civil Engineering practice. He is experienced in the fields of geotechnical engineering, foundation engineering, and geotechnical earthquake engineering. He has worked on projects ranging from geotechnical and ground motion assessments for earth dams, stabilization of large landslides, moisture intrusion through slab-on-grade concrete floor, failure analysis of mechanically stabilized earth retaining walls (with soil nail anchors and geogrid reinforcement), soil erosion associated with landfill cover, and construction vibration monitoring, damage potential assessment associated with such vibrations, and pipeline failure investigations. Dr. Doroudian has also performed geotechnical engineering analysis for more than 400 telecommunication facility sites. In addition, he has extensive laboratory soil testing experience ranging from development of a special device for measuring small-strain behavior of soils (one copy is currently used at University of Rome, Italy) and development of special equipment for sample preparation from wide-diameter tubes for triaxial testing, to special techniques for centrifuge testing of soil nailed excavations models under cyclic loads. He is also experienced in Geotechnical field instrumentation of measuring equipment such as tiltmeters, inclinometers, piezometers, geophones, and seismometers. Dr. Doroudian is currently serving on the ASCE Standards Committee KSTAT (Fitting of Hydraulic Conductivity with Statistical Spatial Estimation).

Dr. Doroudian's major areas of research include; development of a GIS-based geotechnical database for seismic microzonation for Southern California Earthquake Center (SCEC) and University of Zagreb, Croatia. He has performed joint research with an international team on evaluating the socio-economic impact of large earthquakes, using a combination of GIS-based geotechnical database and nonlinear I-D site response effective stress analysis to evaluate the effect of local geologic conditions and soil type on seismic response. Other major areas of research have been small-strain behavior of soils in NGI direct simple shear test; centrifuge testing of soil nailed excavations models under cyclic loads; and settlement of compacted fill under seismic and similar cyclic loads.

Academic Credentials and Professional Honors

Ph.D., Geotechnical Engineering, University of California, Los Angeles, 1997
M.S., Geotechnical Engineering, University of California, Los Angeles, 1993
B.S., Structural Engineering, University of California, Los Angeles, 1991

Licenses and Certifications

Registered Professional Engineer, California, #62177; Registered Professional Civil Engineer, Arizona, #51184; Registered Geotechnical Engineer, California, #2815

Publications

Loaiciga HA, et al. Standard guideline for fitting saturated hydraulic conductivity using probability functions. ASCE/EWRI Standard 50-2008, ASCE Press, Reston, VA, 2008.

Loaiciga HA, et al. Standard guideline for estimating the effective saturated hydraulic conductivity. ASCE Standard 51-2008, ASCE Press, Reston, VA, 2008.

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Doroudian M, Vucetic M. A direct simple shear device for measuring small-strain behavior. *ASTM Geotechnical Testing Journal* 1995; 18(1):69–85.

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Conference Proceedings

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Murillo B, Wardak S, Hamilton DL, Shrestha PL, Cydzik K, Doroudian, M. Sedimentation analysis for existing and proposed development conditions. *Proceedings, International Conference on Water, Environment, Energy and Society (WEES-2009)*, pp. 1636–1641, New Delhi, India, January 12–16, 2009.

Shrestha P, Hamilton D, Lyle J, Doroudian M, Shaller P. Analysis of flood hazards for a residential development. Proceedings, ASCE World Environmental and Water Congress, Tampa, FL, May 15–19, 2007.

Shrestha P, Bigham G, Hamilton D, Doroudian M. A three-dimensional model for Lake Sam Rayburn, Texas. Proceedings, ASCE International Perspective on Environmental and Water Resources, New Delhi, India, December 18–20, 2006.

Hamilton D, Shrestha P, Lyle J, Doroudian M, Shaller P. Flood hazard analysis and protection plan for a residential development. Proceedings, ASCE World Environmental and Water Resources Congress, Omaha, NE, May 21–25, 2006.

Shaller P, Hamilton D, Shrestha P, Lyle J, Doroudian M. Investigation of flood and debris flow recurrence—Andreas Canyon, San Jacinto Range, Southern California. Proceedings, ASCE World Environmental and Water Resources Congress, Omaha, NE, May 21–25, 2006.

Shaller P, Hamilton D, Doroudian M, Shrestha P, Lyle J, Cattarossi A. Investigation of flood hazards on alluvial floodplains. Proceedings, ASCE World Water and Environmental Resources Congress, Anchorage, AK, May 16–19, 2005.

Shrestha P, Hamilton D, Jordan N, Doroudian M, Hong S, Proctor D. Impact of sewage line spills on pathogen levels in recreational waters. Proceedings, ASCE World Water and Environmental Resources Congress, Anchorage, AK, May 16–19, 2005.

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Hamilton D, Shaller P, Lyle J, Doroudian M, Shrestha P. Multi-disciplinary approach to distinguishing flood hazards on alluvial floodplains. Presentation, Arid Regions 10th Biennial Conference, Restoration and Management of Arid Watercourses, Mesa, AZ, November 16–19, 2004.

Shaller P, Hamilton D, Doroudian M, Shrestha P, Lyle J, Cattarossi A. Interpretation of tectonic, fluvial, and eolian landforms in the Upper Coachella Valley, California, using aerial photography, DEM, and LiDAR technology. Poster Presentation, Geological Society of America, Denver Annual Meeting, Denver, CO, November 7–10, 2004.

Vucetic M, Kocijan J, Doroudian M. Kinematics and failure of soil-nailed excavation models in dynamic centrifuge tests. Proceedings, International Symposium on Landmarks in Earth Reinforcement, Fukuoka, Japan, A.A. Balkema Publisher, Vol. 1, pp. 737–742, 2001.

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Doroudian M, Vucetic M. Integration of 3-D geotechnical database of Los Angeles and 1-D nonlinear site response model into a GIS for seismic microzonation. Proceedings, NEHERP Conference and Workshop on Research on the Northridge, California Earthquake of January 1994, Published by Nonprofit Organization “California Universities for Research in Earthquake Engineering CUREe,” Richmond, CA, Vol. II, Earth Sciences, pp. 189–198.

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Vucetic M, Doroudian M, Martin GR. Development of geotechnical site database for Southern California for seismic microzonation. Proceedings, 3rd Annual Caltrans Seismic Workshop, Sacramento, CA, June 1994.

Tufenkjian MR, Vucetic M, Doroudian M. Stability of soil nailed excavations. Proceedings, International Workshop on Technology for Hong Kong’s Infrastructure Development Infrastructure ’91,’ pp. 751–762, Hong Kong, 1991.

Published Conference Abstracts

Doroudian M, Vucetic M. Integration of 3-D geotechnical database for Los Angeles and 1-D nonlinear site response model into a GIS for seismic microzonation. Proceedings, Northridge Earthquake Research Conference, 42 p., Los Angeles, CA, August 1997.

Doroudian M, Vucetic M. Densification of the SCEC Geotechnical Database and its integration with a nonlinear site response model in a GIS environment. Proceedings, Southern California Earthquake Center 1997 Annual Meeting, p. 61, Costa Mesa, CA, 1997.

Vucetic M, Doroudian M. Methodology for utilization of SCEC geotechnical database to assess nonlinear site response. Proceedings, Southern California Earthquake Center, 1996 Annual Meeting, pp. 44–45, Palm Springs, CA, 1996.

Doroudian M, Vucetic M, Martin GR. Development of geotechnical database for Los Angeles. Proceedings, 1995 Annual Conference of the International Association for Mathematical Geology and the International Symposium for Geoinformatics, Session No. IV, pp. 161–163, Osaka, Japan, 1995.

Research Reports

Vucetic M, Doroudian M, Matesic L. Results of geotechnical laboratory tests on soil samples from the UC San Diego Campus. Report for University of California’s Campus-Laboratory Collaboration (CLC) Program research project “ Estimation of the Ground Motion Exposure from Large Earthquakes at Four UC Campuses in Southern California,” UCLA Research Report No. ENG-99-203, Civil and Environmental Eng. Department, University of California, Los Angeles, 110 p., May 1999.

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Vucetic M, Hsu CC, Doroudian M. Results of cyclic and dynamic simple shear tests on soils from La Cienega Site conducted for ROSRINE project and other research purposes. UCLA Research Report No. ENG-98-200, Civil and Environmental Engineering Department, University of California, Los Angeles, 440 p., December 1998.

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Report, Civil and Environmental Engineering Department, University of California, Los Angeles, 255 p., May 1994.

Doroudian M, Vucetic M. A direct simple shear device for measuring small-strain behavior of soil. Research Report No. ENG 93-185, Civil and Environmental Engineering Department, University of California, Los Angeles, 129 p., June 1993.

Vucetic M, Tufenkjian MR, Doroudian M. Dynamic centrifuge testing of soil-nailed excavations—Testing program and procedure. Research Report No. ENG 92-180, Civil and Environmental Engineering Department, University of California, Los Angeles, 50 p., June 1992.

Lectures

Doroudian M. Double specimen direct simple shear device for measuring small-strain behavior. Invited instructor at University of Rome, Rome, Italy, November 2002.

Doroudian M, Vucetic M. Methodology for utilization of SCEC Geotechnical Database to assess nonlinear site response. Taisei Institute of Construction Technology, Taisei Corporation, Yokohama, Japan, November 1994.

Doroudian M. Small-strain behavior of soils in direct simple shear. Institute of Industrial Science, Tokyo University, Tokyo, Japan, June 1994.

Doroudian M. Utilization of geotechnical database for seismic microzonation. Kajima Institute of Construction Technology, Kajima Corporation, Tokyo, Japan, June 1994.

Doroudian M. Development of geotechnical database for Palo Alto and its utilization for seismic microzoning. CUREe-Kajima Annual Meeting, California Institute of Technology, Pasadena, CA, October 1994.

Doroudian M, Vucetic M. Geotechnical database for Southern California. NSF Workshop on Scientific Supercomputing, Visualization, and Animation in Geotechnical Earthquake Engineering and Engineering Seismology, Carnegie Mellon University, November.

Posters

Shrestha PL, Hamilton D, Jordan N, Lyle JE, Doroudian M, Shaller PJ, Wardak S, Cydzik K, Medellin J. Inland flood hazard analysis and mitigation. Poster, ASCE-EWRI World Environmental & Water Resources Conference, Honolulu, HI, May 12–16, 2008.

Wardak S, Murillo B, Hamilton D, Shrestha PL, Doroudian M, Cydzik K, Medellin J, Shaller PJ. Sedimentation analysis in an open channel network for existing and proposed development conditions. Poster, ASCE-EWRI World Environmental & Water Resources Conference, Honolulu, HI, May 12–16, 2008.

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Doroudian M, Vucetic M. Methodology for utilization of SCEC Geotechnical Database to assess nonlinear site response. Poster Session, Southern California Earthquake Center Annual Meeting, Palm Springs, CA, October 1996.

Doroudian M. Development of geotechnical site database for Southern California. Poster Session, NSF/USGS 3rd-Year Review Site Visit of the Southern California Earthquake Center, University of Southern California, Los Angeles, September 1993.

Doroudian M, Tufenkjian. Seismic stability of soil nailed excavations. EERI, Annual Meeting, San Francisco, CA, 1991.

Prior Experience

Project Manager, Bing-Yen and Associates, 1998–2001

Post-doctoral Fellow, University of California, Los Angeles, 1996–1997

Academic Appointments

- Part-time Faculty, Department of Civil and Environmental Engineering, University of California, Los Angeles, 1997–present

Professional Affiliations

- American Society of Civil Engineers—ASCE
- ASCE Standards Committee—KSTAT
- Earthquake Engineering Research Institute—EERI