

David W. Sykora, Ph.D., P.E., G.E.
Principal Engineer and Office Director**Professional Profile**

Dr. David W. Sykora is a Principal Engineer in Exponent's Civil Engineering practice and Director of the Boston (Natick) office. Dr. Sykora specializes in geotechnical engineering and earthquake engineering, including the evaluation of natural hazards, construction defects, system performance, and failures. He has a wide range of project experience including planning studies, building code development, due diligence or feasibility assessments, engineering analyses, geotechnical design, design review for municipalities, construction monitoring, performance evaluations, and failure analyses for reservoir dams, mine tailings dams, levees, embankments, flood control channels, basins, pressurized and gravity pipelines, commercial buildings, hospitals, medical and health research facilities, schools, manufacturing facilities, natural gas transportation systems and crude oil refineries, a nuclear power plant, gaseous diffusion plants, retaining and revetment walls, soil nail and soil screw walls, bridges, highways, tunnels, parks, recreation areas, and residential developments. He has experience with drilling and sampling, geotechnical instrumentation, mass grading, micro-tunneling, slope stability and landslides, expansive soil, collapsible soil, sensitive soils, saprolite, stiff fissured clays, peat, sinkholes, mine subsidence, loss of lateral support, internal soil erosion ("piping"), ground vibrations, foundation design, earth pressures, soil settlement, slope creep, moisture intrusion, earthquake ground shaking, liquefaction, lateral spread, pavement systems, soil-structure interaction, soil-slab interaction, soil-pipe interaction, fly ash amendment, differing site conditions, defective specifications, and standard of care evaluations.

Dr. Sykora's professional background includes 28 years of experience as a consulting engineer and in applied government research at the former U.S. Army Engineer Waterways Experiment Station (presently ERDC). He has worked on projects in 35 states. Dr. Sykora has international experience on 5 continents in the countries of Canada, Venezuela, Peru, South Korea, Japan, Turkey, Panama, Mexico, and Egypt. His professional career has benefited from extensive involvement in, and leadership of, multi-disciplinary engineering, scientific, and technical teams, including working closely with engineering geologists, hydrologists, structural, mechanical, materials and electrical engineers, architects, instrumentation specialists, seismologists, and geophysicists. Dr. Sykora has provided instruction for graduate-level engineering courses, including organizing and serving as lead instructor for a week-long training course for the U.S. Army Corps of Engineers entitled: "Seismic Stability of Earth Dams."

Academic Credentials and Professional Honors

Ph.D., Civil Engineering, University of Texas at Austin, 1993

M.S., Engineering (Geotechnical), University of Texas at Austin, 1983

B.S., Civil Engineering, Purdue University, 1980

Chi Epsilon
Sigma Xi

Professional Committees

Technical Committee on Forensic Engineering, ASCE

Licenses and Certifications

Professional Engineer, Alabama, #29964-E
Professional Engineer, Arizona, #39650
Geotechnical Engineer, California, #GE2399
Professional Engineer, California, #C54650
Professional Engineer, Colorado, #PE-39008
Professional Engineer, Connecticut, #28185
Professional Engineer, Hawaii, #12034-C
Professional Engineer, Idaho, #10890
Professional Engineer, Illinois, #062-058097
Professional Engineer, Louisiana, #33328
Professional Engineer, Maryland, #38552
Professional Engineer, Massachusetts, #47928
Professional Engineer, Missouri, #PE-2004001383
Professional Engineer, Nevada, #13789
Professional Engineer, New Mexico, #17339
Professional Engineer, New York, #086897
Professional Engineer, Pennsylvania, # P8079386
Professional Engineer, Tennessee, #00113004
Professional Engineer, Texas, #100949
Professional Engineer, Utah, #6929147-2202
Professional Engineer, Vermont, #0068008
National Council of Examiners for Engineering and Surveying, #22706

Publications

Shaller PJ, Shrestha PL, Doroudian M, Sykora DW, Hamilton D. Numerical modeling of the 2005 La Conchita landslide, Ventura County, California. In: Flood hazard identification and mitigation in semi- and arid environments, Richard H. French and Julianne J. Miller (editors), World Scientific Publishing Co., Inc., Hackensack, NJ, September 2011.

Pettinger AP, Sykora DW. Landslide risk assessment for pipeline systems in mountainous regions. Journal of Pipeline Engineering, Vol. 10, Great Southern Press, Beaconsfield, UK, September, 2011.

Vucetic M, Doroudian M, Sykora DW. Cyclic compression of compacted clayey sand at small cyclic strains. Paper No. 1.14a. Proceedings, 5th International Conference on Recent Advances in Geotechnical Engineering and Soil Dynamics, San Diego, CA, 2010.

Sykora DW, Bastani A. Distribution of peak horizontal acceleration and peak horizontal particle velocity with depth measured during earthquakes. Paper No. 137. Proceedings, 6th U.S. National Conference on Earthquake Engineering, Seattle, WA, 1998.

Sykora DW, Moriwaki Y, Barneich J, Abrahamson N. Measured attenuation of peak acceleration and peak particle velocity with depth at soil sites. Paper No. 1573. Proceedings, 11th World Conference on Earthquake Engineering, Acapulco, Mexico, 1996.

Sykora DW, Hunter M, Arzamendi M, Parker DR, Moriwaki Y, Lee SI. Foundation idealization for pile soil-structure interaction analysis at San Diego - Coronado Bay Bridge. Proceedings, 1995 National Seismic Bridge Conference, FHWA and Caltrans, San Diego, CA, 1995.

Sykora DW. Nondestructive determination of material stiffness for potential application at dams and landfills. Proceedings, Nondestructive Evaluation of Aging Structures and Dams, SPIE Vol. 2457, pp. 46-57, Oakland, CA, 1994.

Sykora DW, Hynes ME, Ledbetter RH, Youd TL. Overview of WES research related to seismic design and analysis of waterfront facilities. Proceedings, UJNR Workshop Wind and Earthquake Effects Offshore and Coastal Facilities, Yokosuka, Japan, 1994.

Sykora DW, Roesset JM, Stokoe II KH. Suitability of surface wave measurements in complex geosystems. Proceedings, 26th Joint UJNR Wind & Seismic Effects, NIST SP 871, National Institute of Standards and Technology, pp. 199–212, Gaithersburg, MD, 1994.

Sykora DW, Chrestman AM. Potential role of GIS in earthquake hazard analysis at US Army Engineer WES. Proceedings, Workshop on Geographic Information Systems and Their Application in Geotechnical Earthquake Engineering. Frost, Chameau (eds), ASCE, pp. 100–103, Atlanta, GA, 1993.

Koester JP, Sykora DW, Hynes ME. Seismic stability assessment of Ririe Dam, Idaho. Proceedings, 1st USCOLD Technical Conference, Denver, CO, 1993.

Sykora DW, Koester JP, Wahl RE, Hynes ME. Post-earthquake slope stability of two dams with liquefied gravel foundations. Proceedings, Stability and Performance of Slopes and Embankments II, ASCE, pp. 990–1005, Berkeley, CA, 1992.

Sykora DW, Koester JP. Data base of seismic body wave velocities and geotechnical properties. Proceedings, Geotechnical Engineering Congress 1991, ASCE, pp. 690–700, Boulder, CO, 1991.

Mejia LH, Sykora DW, Hynes ME, Fung K, Koester JP. Measured and calculated dynamic response of rock-fill dam. Proceedings, 2nd International Conference of Geotechnical Earthquake Engineering and Soil Dynamics, Volume II, pp. 1063–1070, St. Louis, MO, 1991.

Sykora DW, Koester JP, Hynes ME. Seismic hazard assessment of liquefaction potential at Mormon Island Auxiliary Dam, California, USA. Proceedings, 23rd Joint UJNR Wind & Seismic Effects, NIST SP 820, National Institute of Standards and Technology, pp. 247–267, Gaithersburg, MD, 1991.

Sykora DW, Hynes ME, Brock WR, Hunt RJ, Shaffer KE. Seismically-induced soil amplification at the DOE Paducah gaseous diffusion plant site. Proceedings, 3rd DOE Natural Phenomena Hazards Mitigation Conference, pp. 147–156, St. Louis, MO, 1991.

Ballard Jr. RF, Comes GD, Sykora DW. Overview of the US Army Corps of Engineers seismic strong-motion instrumentation program (SMIP). Proceedings, Engineering Geology and Geotechnical Engineering Symposium, pp. 1-1 to 1-16, Pocatello, ID, 1990.

Hynes ME, Sykora DW, Wahl RE. Practical evaluation of the seismic stability of a three-dimensional soil-structure interaction problem. Proceedings, 4th US National Conference of Earthquake Engineering, pp. 715–724, Palm Springs, CA, 1990.

Sykora DW. Discussion to “Evaluation of Settlements in Sands Due to Earthquake Shaking.” J Geotech Engin, ASCE 1989; 115(3).

Sykora DW. Evaluation of a method to estimate the soil modulus coefficient, K_2 , and shear modulus. Engin Geol Soils Engin 1989; Balkema Press, Rotterdam.

Sykora DW, Koester JP. Review of existing correlations between shear wave velocity or shear modulus and standard penetration resistance in soils. Proceedings, Earthquake Engineering and Soil Dynamics II Conference, pp. 389–404, Park City, UT, 1988.

Stokoe II KH, Kuo J, Sykora DW, Ladd R, Youd T, Dobry R. Field and laboratory investigations of three sands subjected to the 1979 Imperial Valley earthquake. Proceedings, 8th European Conference of Earthquake Engineering, Lisbon, Portugal, 1986.

Sykora DW, Wahl R, Hynes-Griffin M, Williams G. Selection of a strategy to evaluate seismic stability at Ririe Dam, Idaho. Proceedings, 22nd Symposium on Engineering Geology and Soils Engineering, Boise, ID, 1986.

Sykora DW, Davis G. Installation of soil anchors in a talus slope. Proceedings, 21st Annual Symposium on Engineering Geology and Soils Engineering, Moscow, ID, 1984.

Technical Reports

Integrity analysis of Camisea transportation system, Peru, S.A. Exponent Failure Analysis Associates, Menlo Park, CA, May 2007.

Failure analysis, ash basin #4 release, PPL Martins Creek SES, Bangor, Pennsylvania. Exponent Failure Analysis Associates, Menlo Park, CA, October 19, 2005.

Sykora DW, Costantino CJ, Heymsfield E, Abrahamson NA, Yule DE, Cameron, WI. Comparison of idealization schemes for one-dimensional site response analysis. Technical Report GL-96-18. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1996.

Sykora DW, Roesset JM, Alexander DR. Determination of soil moduli for dynamic response of soil-structure systems on highways. Report 1: Surface waves in sloping ground. Technical Report GL-94-11. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1994.

Sykora DW, Look D, Croci G, Karaesmen E, Karaesmen, E. Reconnaissance report of damage to historic monuments in Cairo, Egypt, Following October 12, 1992 Dahshur earthquake. NCEER-93-0016. National Center for Earthquake Engineering Research, Buffalo, NY, 1993.

Sykora DW, Hynes ME, Karaesmen E. Report of an international workshop on preservation of historic monuments of major importance. Misc. Paper GL-93-23. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1993.

Sykora DW, Davis JJ. Site-specific response analysis of soil columns at Paducah gaseous diffusion plant, Paducah, Kentucky. Misc. Paper GL-93-13. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1993.

Sykora DW, Davis JJ. Site-specific response analysis of soil columns at Portsmouth gaseous diffusion plant, Portsmouth, Ohio. Misc. Paper GL-93-14. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1993.

Sykora DW, Wahl RE, Wallace DC. Geotechnical earthquake engineering software: Report 1, WESHAK (Version 1.0) for personal computers. Instructional Report GL-92-4. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1992.

Sykora DW, Koester JP, Hynes ME, Wahl RE, Yule DE, Stark TD. Seismic stability of Ririe Dam and reservoir project. Report 1: Construction history and field and laboratory studies. Volumes I and II. Technical Report GL-91-22. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1991.

Sykora DW, Koester JP, Hynes ME. Seismic stability of Ririe Dam and reservoir project. Report 2: Stability calculations, analysis, and evaluation. Volumes I and II. Technical Report GL-91-22. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1991.

Sykora DW, Hynes ME. Seismic stability evaluation of Folsom Dam and reservoir project. Report 2: Interface zones. Technical Report GL-87-14. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1989.

Sykora DW. Creation of a data base of seismic shear wave velocities for correlation analyses. Misc. Paper GL-87-26. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1987.

Sykora DW. Examination of existing shear wave velocity and shear modulus correlations in soils. Misc. Paper GL-87-22. U.S. Army Corps of Engineers WES, Vicksburg, MS, 1987.

Sykora DW, Stokoe II KH. Seismic investigations of three Heber Road sites after October 15, 1979 Imperial Valley earthquake. Geotechnical Engineering Report GR82-24. University of Texas, Austin, TX, 1982.

Technical Courses Instructed

Seismic Stability of Earth Dams. US Army Corps of Engineers. PROSPECT Course #247. Huntsville, AL, August 31 – September 4, 2009.

Advanced Foundation Engineering. Graduate School of Civil Engineering (Geotechnical emphasis). California Polytechnic University, Pomona, CA, Winter 2009.

Advanced Foundation Engineering. Graduate School of Civil Engineering (Structural emphasis). California Polytechnic University. Pomona, CA, Winter 2007.

Soil Mechanics Laboratory. University of Texas at Austin, TX, Fall 1980.

Presentations

Sykora, DW. Geotechnical Contributions, Seminar entitled: Mitigation of Damage to Structures Adjacent to Construction Sites in Urban Environments in New York, Lorman Educational Services, Plainfield, NY, September 27, 2011.

Sykora, DW. Three sessions: Geotechnical Services, Geotechnical Engineer of Record, and Geotechnical Reports, Seminar entitled: Understanding Geotechnical Reports and Designs in Massachusetts, Lorman Educational Services, Woburn, MA, September 28, 2010.

Sykora DW. The exposure of expert videos. Massachusetts Defense Lawyers Association, Annual Meeting and Spring Seminar, Boston, MA, May 7, 2010.

Sykora, DW. Failure of 10-foot-diameter MWRA water pipeline, Weston, MA, May 1, 2010. Interview on FM 90.9 WBUR with Mr. Bob Oakes during Morning Edition, Boston affiliate of National Public Radio (NPR), May 5, 2010.

Sykora DW. Recent experience with soils experiencing severe collapse potential. Geotechnical Engineering Seminar Lecture, Virginia Polytechnical Institute, Blacksburg, VA, March 31, 2010.

Sykora DW. Overview of Civil Engineering at Exponent via video case histories. Civil Engineering Lecture, Massachusetts Institute of Technology, Cambridge, MA, February 25, 2010.

Sykora DW. Recent experience with soils experiencing severe collapse potential. Geotechnical Engineering Lecture, University of Michigan, Ann Arbor, MA, February 4, 2010.

Sykora DW. Recent experience with soils experiencing severe collapse potential. Geotechnical Engineering Lecture, Northeastern University, Boston, MA, December 3, 2009.

Mathieson, EL and Sykora, DW. Ground failures and other water-related property damage. Lorman Educational Services Teleconference, November 10, 2009. (Invited speaker).

Sykora DW. Recent experience with soils experiencing severe collapse potential. Geotechnical Engineering Lecture, Purdue University, W. Lafayette, IN, September 16, 2008.

Sykora DW. Recent experience with soils experiencing severe collapse potential. Geotechnical Engineering Lecture, University of Illinois, Urbana, IL, September 15, 2008.

Sykora DW. Beyond a reasonable degree of engineering certainty: Convincing the non-trier(s) of fact. Presented to quarterly meeting of ASCE, Metro Los Angeles Branch, Forensic Technical Group, Long Beach, CA, May 27, 2008. (Invited speaker).

Sykora DW. Potential effects of earthquakes on dams in China following May 12, M7.9 Wenchuan earthquake. CCTV-9, Beijing, China, May 15, 2008. (Television interview).

Sykora DW. Construction sites in urban environment: Damages to adjacent structures in California. Presented at Lorman Educational Services Seminar, San Francisco, CA, September 20, 2007. (Invited participant).

Sykora DW. Engineering and technical approaches and innovations. Presented at Louisiana Coastal Protection and Restoration Project, U.S. Army ERDC, Vicksburg, MS, March 2–3, 2006. (Invited participant).

Sykora DW. Where do we stand with the levees and floodwalls? Assessing Katrina: Ecosystems, urbanization, and the real costs of reclamation. Presented at Stanford University, Palo Alto, CA, 2006. (Invited participant).

Sykora DW. New approaches to evaluating and explaining recurring geotechnical issues in litigation cases. Presented at ASCE Forensic Technical Seminar, Irvine, CA, 2002. Also presented at Graduate School of Civil and Environmental Engineering, UCLA, Los Angeles, CA, 2002. (Invited participant).

Sykora DW. Distribution of peak horizontal acceleration and peak horizontal particle velocity with depth during earthquakes. Presented at Graduate School of Civil and Environmental Engineering, UCLA, Los Angeles, CA, 1998. (Invited participant).

Sykora DW. Measured attenuation of peak acceleration and peak particle velocity with depth at soil sites. Presented at 11th World Conference on Earthquake Engineering, Acapulco, Mexico, 1996.

Sykora DW. Seismic hazard mapping for Southern California. Presented at USGS, California Institute of Technology, Pasadena, CA, June 28–29, 1995. (Invited participant).

Sykora DW. Foundation idealization for pile soil-structure interaction analysis at San Diego - Coronado Bay Bridge. Poster presented at 1995 National Seismic Bridge Conference, FHWA and Caltrans, San Diego, CA, 1995.

Sykora DW. Nondestructive determination of material stiffness for potential application at dams and landfills. Presented at Symposium on Nondestructive Evaluation of Aging Structures and Dams, Oakland, CA, 1994.

Sykora DW. Overview of WES research related to seismic design and analysis of waterfront facilities. Presented at UJNR Workshop Wind and Earthquake Effects for Offshore and Coastal Facilities, Yokosuka, Japan, 1994. (Invited participant).

Sykora DW. Suitability of surface wave measurements in complex geosystems. Presented at 26th Joint UJNR Wind & Seismic Effects, National Institute of Standards and Technology, Gaithersburg, MD, 1994.

Sykora DW. Presented paper at US–Japan Joint Panel on Wind and Seismic Effects, International Workshop on Wind and Earthquake Engineering for Offshore and Coastal Facilities, Port and Harbour Research Institute, Yokosuka, Japan, May 12–13, 1993. (Invited participant).

Sykora DW. Presented paper at Annual Meeting of the American Research Center in Egypt, Johns Hopkins University, Baltimore, MD, April 23, 1993. (Invited participant).

Sykora DW. Session Moderator: Geographic information systems and their application in geotechnical earthquake engineering. Presented at National Science Foundation, Atlanta, GA, January 29–30, 1993. (Invited participant).

Sykora DW. Mitigation of damage from earthquakes and groundwater to historic monuments in Cairo. Presented at International Hazards Conference, Cairo, Egypt, 1993.

Sykora DW. Relevance of engineering study in preservation strategy following October 12, 1992 Cairo earthquake. Presented at 44th Annual Meeting, American Research Center in Egypt, Johns Hopkins University, Baltimore, MD, 1993.

Sykora DW. Potential role of GIS in earthquake hazard analysis at U.S. Army Engineer WES. Presented at Workshop on Geographic Information Systems and Their Application in Geotechnical Earthquake Engineering, ASCE, Georgia Institute of Technology, Atlanta, GA, 1993.

Sykora DW. Designing a soil-structure experiment. Presented at USGS, San Francisco, CA, February 7, 1992. (Invited participant).

Sykora DW. Site amplification effects on earthquake ground motions. Presented at National Institute of Standards and Technology, Gaithersburg, MD, January 27, 1992. (Invited participant).

Sykora DW. Update of earthquake site response analysis for central and eastern U.S. (CEUS). Presented at U.S. Army Corps of Engineers, National Materials Laboratory and Geotechnical Conference, Sacramento, CA, 1992.

Sykora DW. Evaluation of surface wave propagation in two-dimensional geosystems. Presented at U.S. Army Corps of Engineers, National Materials Laboratory and Geotechnical Conference, Sacramento, CA, 1992.

Sykora DW. Measured and calculated dynamic response of rock-fill dam. Poster presented at 2nd International Conference of Geotechnical Earthquake Engineering and Soil Dynamics, St. Louis, MO, 1991.

Sykora DW. Seismically-induced soil amplification at the DOE Paducah gaseous diffusion plant site. Poster presented at 3rd DOE Natural Phenomena Hazards Mitigation Conference, St. Louis, MO, 1991.

Sykora DW. Overview of the U.S. Army Corps of Engineers Seismic Strong-Motion Instrumentation Program (SMIP). Presented at Engineering Geology and Geotechnical Engineering Symposium, Pocatello, ID, 1990.

Sykora DW. Practical evaluation of the seismic stability of a three-dimensional soil-structure interaction problem. Poster presented at 4th U.S. National Conference of Earthquake Engineering, Palm Springs, CA, 1990.

Sykora DW. Evaluation of a method to estimate the soil modulus coefficient, K_2 , and shear modulus. Presented at 25th Symposium on Engineering Geology and Soils Engineering, Reno, NV, 1989.

Sykora DW. Review of existing correlations between shear wave velocity or shear modulus and standard penetration resistance in soils. Poster presented at Earthquake Engineering and Soil Dynamics II Conference, Park City, UT, 1988.

Sykora DW. Installation of soil anchors in a talus slope. Presented at 21st Annual Symposium on Engineering Geology and Soils Engineering, Moscow, ID, 1984.

Other Workshops, Seminars, Meetings, and Training Attended

Seminar Moderator, "Understanding Geotechnical Designs and Reports in Massachusetts," Lorman Seminar, Woburn, MA, September 29, 2010.

"Dam Safety," Association of State Dam Safety Officials, Seattle, WA, September 20-23, 2010.

Session Moderator, Fifth Forensic Engineering Congress, ASCE, Washington, DC, November 11-13, 2009.

“Dam Safety 2009,” Association of State Dam Safety Officials, Miami, FL, September 28, 2009.

Field Trip: St. Francis Dam and La Conchita Landslide, Association of Environmental and Engineering Geologists, September 24, 2007.

“Dam Safety 2007,” Association of State Dam Safety Officials, Austin, TX, September 9–13, 2007.

“Micropiles – Developments in Design and Construction,” Short Course, Orlando, FL, January 28, 2004.

“Construction Defect Claims in California,” Lorman Education Services, Costa Mesa, CA, September 20, 2001.

“Inspection of Driven Piles,” Deep Foundation Institute, Costa Mesa, CA, June 6, 2000.

“1997 Seminar on Current Practice & Advancement of Post-Tensioned Residential Slabs on Expansive Soil,” Post-Tensioning Institute, City of Industry, CA, November 19, 1997.

“Understanding the Building Code Effectiveness Grading Schedule,” ICBO, Whittier, CA, July 22, 1997.

“SMIP97 Seminar on Utilization of Strong-Motion Data,” CDMG, Los Angeles, CA, May 8, 1997.

“Evaluation of and Mitigation Within Coseismic Zones of Surface Deformation,” Southern California Earthquake Consortium, Los Angeles, CA, May 13-14, 1997.

48th Annual Meeting: “Enduring Lessons from Earthquakes,” Earthquake Engineering Research Institute, Los Angeles, CA, February 7-10, 1996.

“Structural Considerations of Building Conservation Towards the 21st Century,” SEAOC, Whittier, CA, January 27, 1996.

Research Utilization Council Meeting, Southern California Earthquake Consortium, Los Angeles, CA, November 16, 1994.

Third Annual Seismic Research Workshop, Caltrans, Sacramento, CA, June 27–29, 1994.

“Grid Generation, Adaptive Refinement, and Redistribution,” University of Texas Continuing Engineering Studies, Austin, TX, May 3–5, 1993.

EERI Annual Meeting: “Infrequent Large Earthquakes: Implications for Practice and Research,” Seattle, WA, February 11–13, 1993.

44th Annual Meeting: “New Trends in Earthquake Engineering,” Earthquake Engineering Research Institute, San Francisco, CA, February 6–8, 1992.

“Finite Elements: Computational Aspects,” University of Texas Continuing Engineering Studies, Austin, TX, March 5–7, 1991.

“Non-Linear Finite Element Analysis,” Ted Belytschko and T. J. R. Hughes, Menlo Park, CA, July 23-27, 1990.

“Eastern and Central U.S. Earthquake Symposium: Threat and Response,” USGS, Charleston, SC, May 8-9, 1989.

“Regional Seminar on Earthquake Fundamentals for the Mississippi Valley,” EERI, Memphis, TN, October 29, 1985.

Prior Experience

Bing Yen & Associates, Irvine, CA, 1996–2001

Woodward-Clyde Consultants, Santa Ana, CA, 1994–1996

U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS, 1985–1994

Northern Engineering & Testing, Billings, MT, 1982–1985

Project Experience

Summarized below is a sample of projects for which Dr. Sykora has played a key role:

Folsom Dam, California—Project engineer responsible for evaluating the safety of interface zones between 200-foot-high, earth-fill embankments and concrete gravity dam for 1,000,000 acre-feet reservoir as part of Corps of Engineers’ national dam safety program. Work performed included detailed review and analysis of construction records. Work was peer reviewed by blue ribbon panel that included: Professors Ralph Peck, Bruce Bolt, and the late H.B. Seed.

Ririe Dam, Idaho—Project engineer responsible for interpretation of field testing, material characterization, numerical analyses, and evaluation of liquefaction hazards at a large rock-fill dam founded on gravel alluvium as part of Corps of Engineers’ national dam safety program. The dam is 840 feet long and 184 feet high with a storage capacity of 100,000 acre-feet. Design ground shaking developed by seismologist was 1.2g resulting in significant potential for liquefaction of gravel alluvium beneath the dam. Potential three-dimensional effects of the dam response were evaluated because of narrow canyon. Work was peer reviewed by late Professors H.B. Seed and R.B. Peck.

Simi Valley Dam, California—Geotechnical engineer of record for the investigation, design and earthwork construction of new earth-fill dam constructed upstream of Simi Valley. Dam is 475 feet long with a maximum height of 24 feet. The dam was constructed with limited fine-grained material available. During construction, fault was observed in foundation excavation and found to be inactive.

Bird's Point Levee, Missouri—Project engineer responsible for evaluating the liquefaction effects of blasting a fuse plug levee along the Mississippi River.

PPL Ash Basin #4 Failure, Pennsylvania—Lead investigator, part of multi-disciplinary team, assessing the causation of the loss of approximately 1,000,000 gallons of water and fly ash stored in a detention basin into the Delaware River. Cause of the breach was attributed to rupture of wooden stop log in outlet tower used to regulate basin pool elevation.

Breach of Harbor Quay Wall, California—Lead investigator responsible for evaluating the cause of the breach of a quay wall temporarily supported by a wood-lagged retaining wall along an adjoining excavation for a new building. The failure was attributed to a piping failure of soil retained by temporary wall during high tide resulting from a gap between the bottom of the lagging and bedrock.

Children's Hospital of Los Angeles, California—Project engineer responsible for geotechnical investigation, foundation design, and seismic design parameters for new surgery center and seismic retrofit of existing multi-story hospital complex. Foundation recommendations included alternatives for deep foundation systems. Design PGA for 950-year design event was 0.85g.

Segunda Deshecha Flood Control Channel, California—Geotechnical engineer responsible for the investigation and design recommendations for rehabilitation and upgrades to urban flood control channel. Stability of slopes above the channel during construction was evaluated. Recommendations included use of various types of retaining wall systems, including cantilever walls, soil nail walls, and tieback anchor walls as well as localized re-alignment of the channel.

Washington Avenue Bridge Seismic Retrofit, California—Geotechnical engineer responsible for field investigation, evaluation of potential ground failure hazards, and potential geotechnical stabilization measures for bridge founded in predominantly granular alluvium. Analysis indicated that factor of safety was on the cusp of County requirements for geotechnical stabilization. Results were corroborated with past performance during moderate to strong earthquake ground shaking during 1987 Whittier earthquake.

Camisea Transportation System, Peru—Lead geotechnical engineer, part of multi-disciplinary team, assessing the potential geotechnical and seismic hazards to 700-km natural gas pipeline system running from Amazon basin, over the Andes Mountains, to Lima. Exponent's retention followed five reported breaches in the natural gas liquids (NGL) pipeline, one of two pipelines in the system, within the first 18 months of operation. Three of the five breaches were attributed to external soil loading acting on the pipeline from landslides and earth movement. Assisted in developing hybrid system to evaluate risk from geotechnical and geologic hazards.

Paducah, KY, Gaseous Diffusion Plant—Principal investigator tasked with evaluating earthquake site response as part of seismic safety program. Ground motions records, provided by Robin McGuire, were dominated by hazards associated with New Madrid fault zone. Analyses were performed using SHAKE.

Portsmouth, OH, Gaseous Diffusion Plant—Principal investigator tasked with evaluating earthquake site response as part of seismic safety program. Analyses were performed using SHAKE.

Hamaca Crude Oil Upgrade Facility, Venezuela—Principal geotechnical engineer tasked with evaluating the presence, extent and implications of collapsible soil being present at a large crude oil refinery under construction. Participated in joint destructive testing program that included sampling from large exploration pits, plate load tests of foundation soils, and extensive laboratory testing. Foundation soils were found to have extreme collapse potential, with some measured volumetric changes over 20 percent upon wetting. Modifications were made to the foundation plans to over-excavate and re-compact foundation soils to mitigate the collapse potential.

Calle de Barco Landslide, California—Initially involved with annual review of data and reports for the City of Malibu and landslide assessment district. Later, assigned as principal geotechnical investigator to evaluate the cause of the 1998 landslide and failure of retaining wall at toe of the slope. Also reviewed grading report for slope repairs.

Big Rock Mesa Landslide, California—Principal engineer responsible for quarterly review and interpretation of instrumentation and dewatering data and annual reporting of findings to the City of Malibu and assessment district. Data evaluated included: annual rainfall, groundwater measured in 29 standpipe and 16 pneumatic piezometers, dewatering from 21 dewatering wells and 35 hydraugers, ground deformation from 29 slope inclinometers, and surface displacements from GPS surveys at 23 monuments.

Long Beach Fleet Center, California—Geotechnical engineer of record for geotechnical investigation, foundation design, seismic design ground motions, and earthwork grading for several buildings, cantilever retaining wall, and large parking areas to be constructed on 19-acre site in urban environment. Study involved review of historic use of site using aerial photographs and other sources. Foundation recommendations included overexcavating and recompacting foundation soil to a depth of 12 feet in area of primary building because of abandoned oil gas line trenches.

State Office Building and Parking Garage, California—Project engineer responsible for geotechnical investigation, seismic design ground motions, and design of foundation system for four-story structure and parking garage to be placed along harbor. Design included use of stone columns to mitigate hazards of liquefaction and lateral spread. Design relied on CPT soundings and SPT blowcounts to evaluate liquefaction potential and design of stone column system.

Regional Headquarters/Warehouse Facility, California—Geotechnical engineer of record, responsible for geotechnical investigation, seismic design parameters, foundation design and

monitoring of grading during construction for large office/warehouse complex founded on soft clays and peat deposits. The building footprint was about 8 acres situated on a 23-acre site. Investigation included CPT, undisturbed sampling, and laboratory testing. Foundation recommendations implemented involved overexcavation of foundation soils and replacement with gravel pads wrapped with geo-fabric.

Entertainment Complex, California—Principal geotechnical engineer for foundation design of entertainment complex consisting of a theatre, retail stores, restaurants and multi-story parking garage to be constructed in dense urban environment. Geotechnical investigation included CPT, SPT, and laboratory testing in loose alluvium with slight to moderate collapse potential. Foundation recommendations involved deep foundation system, a portion of which was adjacent to an existing masonry building.

Pre-Load Heaving of Peat, British Columbia—Lead investigator for owners of temple facility damaged by heaving of thick peat deposits along the Fraser River caused by soil preloading on adjacent property. Analysis of CPT records provided evidence that some of the damage was associated with pre-loading.

Malibu City Geotechnical Engineer, California—Under contract with the city, responsible for overseeing review of all geologic and geotechnical reports submitted to the city for development. Reported to Building Official. City Geologist and other review staff reported to me. Also responsible for monitoring and reporting on the performance of landslides in assessment districts for Public Works Director.

Cell Tower Design, California—Principal engineer in charge of the investigation and design of hundreds of monopole towers and several multi-leg towers built for cellular telephone industry.

Hollywood Fault Hazard—Consultant to the City of West Hollywood and joint reviewer of geologic/geotechnical reports for new urban development along the Hollywood fault. Assisted in developing new ordinances to building code.

Tunnel Detection System, Korea—Project engineer responsible for coordinating the design and construction of a telemetered, seismic-based system to detect tunneling activities. Also responsible for clandestine deployment and operation of the system along the DMZ on the Korean peninsula.

Preservation of Historic Monuments, Turkey and Egypt—Project engineer responsible for assisting with International workshop, including inspection of historic Islamic mosques in Turkey; later, Principal Investigator of multi-disciplinary team sponsored by NSF to evaluate the effects of the 1992 earthquake on historic mosques and other centuries-old Islamic architecture in Cairo.

Academic Appointments

- California State Polytechnic University, Pomona – Graduate School Lecturer, Department of Civil Engineering
- University of Texas at Austin—Teaching Assistant, Soil Mechanics Laboratory, Fall 1980

Professional Affiliations

- American Society of Civil Engineers (member)
- Boston Society of Civil Engineers Section (member)
- ASCE Geo-Institute (member)
- Earthquake Engineering Research Institute (member)
- Association of State Dam Safety Officials (affiliate member)
- US Society on Dams (member)

Cited Cases

Alvis v. County of Ventura. 2nd Appellate District, Division Six, Case B212337, Court of Appeal of the State of California, filed Oct. 20, 2009. Upheld by California Supreme Court.