

20th C.W. Lovell Distinguished Lecture

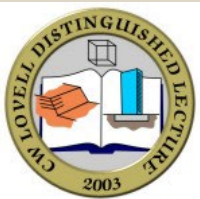
5:30 pm, Wednesday, September 16th, 2026

Wetherill Laboratory of Chemistry
Room 104

Professor Kenichi Soga

Smart Geotechnical Infrastructure to Realize Performance-based Design and Operation

Abstract: Advances in sensing and data analytics now allow engineers to observe how infrastructure truly performs. This lecture proposes a performance-based monitoring framework that pairs conventional conservative design predictions with "most probable" predictions, defining performance thresholds spanning construction and operation. Two case studies illustrate the approach: distributed strain monitoring of post-grouted shafts, revealing load transfer, bending, and construction effects hidden from conventional gauges; and thirty years of water pipeline failure data, where modern machine learning models match but do not surpass empirical experience, underscoring the need for early-warning monitoring. Embedding intelligence during construction enables progressive modification, performance-based maintenance, and sustainability.



C. W. LOVELL DISTINGUISHED LECTURE

Professor Emeritus C. W. "Bill" Lovell was a native of Louisville, Kentucky, and received his BCE from the University of Louisville. He served in the U.S. Navy Construction Battalions (SeaBees) during World War 2 and taught at the University of Louisville after the War. In 1948, he came to Purdue University, and he remained in that employment until 2012, receiving MSCE and Ph.D. degrees in the process. His service in Civil Engineering extended over 48 years, including major professorship for 60 theses and authorship for almost 200 papers. During his distinguished career at Purdue University, Prof. Lovell was major professor to 112 students, 60 of whom wrote research theses, and published in excess of 200 papers. His research interests were broad and varied including soft rocks (shales), compaction and compacted properties, soil fabric and pore size distribution, slope stability and erosion, cold regions, pavements, and uses of waste materials in geotechnical engineering. In 1994, Bill became a facilitator/coach in Human Resources Services at Purdue. He specialized in delivering a variety of FranklinCovey leadership/personal development seminars and received a "Facilitator of the Year" award from FranklinCovey. Bill was active in community volunteer organizations and continued to be an avid fly fisherman.



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Bio: Kenichi Soga is the Donald H. McLaughlin Chair and Distinguished Professor of Civil and Environmental Engineering at UC Berkeley. He is the Director of the Berkeley Center for Smart Infrastructure and a faculty scientist at Lawrence Berkeley National Laboratory. Educated at Kyoto University and Berkeley, he taught at the University of Cambridge before joining Berkeley in 2016. His research spans infrastructure sensing, performance-based design, energy geotechnics and soil behavior. He co-authored the textbook Fundamentals of Soil Behavior. He is a member of the National Academy of Engineering, a fellow of the UK Royal Academy of Engineering, the Institution of Civil Engineers (ICE), the American Society of Civil Engineers (ASCE), and the Engineering Academy of Japan.

Beginning in 2003, the C. W. Lovell Distinguished Lecture series was established through the generosity of Professor Bill and Mary Ellen Lovell, who expressed an interest in creating a lecture series at Purdue that will have staying power - one in which a track record of scholarship is clearly established. Thus, each year, lecturers with outstanding accomplishments in geotechnical engineering research are invited to Purdue University. The lecture series creates an excellent opportunity for our graduate students to meet and interact with some of the most important names in geotechnical engineering in person at Purdue.

