PURDUE UNIVERSITY *Lyles School of Civil Engineering*

18th C.W. Lovell Distinguished Lecture

4:30 pm, Friday, November 3, 2023

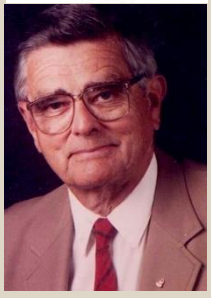
Burton Morgan Bldg. Room 121, Purdue University

Professor Edward Kavazanjian, Jr.

GEO-Alchemy: Biogeotechnical Carbonate Precipitation for Hazard Mitigation and Ground Improvement

Biomediated carbonate precipitation is perhaps the most studied phenomena in the emerging field of biogeotechnical engineering. These geotechnologies use either enzymes (enzyme induced carbonate precipitation, or EICP) or microbes (microbially induced carbonate precipitation, or MICP) to induce precipitation of calcium carbonate in granular soils, turning cohesionless sand into a sandstone-like material ("geo-alchemy"). Laboratory testing and field trials show that these technologies can non-disruptively enhance foundation bearing capacity and mitigate the potential for earthquake-induced liquefaction. Other applications include wind and water erosion control, scour protection, coastal protection, and tunneling in running and flowing sands. Several of these applications have progressed to field or field- scale trials and show promise to provide economy and enhanced sustainability compared to conventional alternatives. However, there are still challenges that need to be addressed to make this promise a reality.

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.

Detailed information on the 18th C. W. Lovell Distinguished Lecture can be found at the following website:
https://engineering.purdue.edu/CE/Academics/Groups/Geotechnical/Details/seminar/Lovell

PURDUE UNIVERSITY *Lyles School of Civil Engineering*

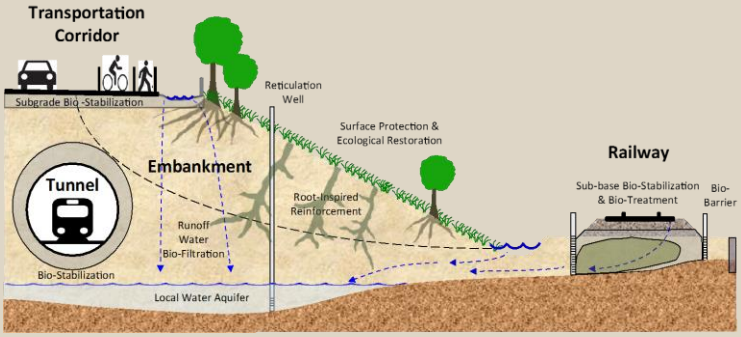
18th C.W. Lovell Distinguished Lecture

4:30 pm, Friday, November 3, 2023
Burton Morgan Bldg. Room 121, Purdue University

Professor Edward Kavazanjian, Jr.

GEO-Alchemy: Biogeotechnical Carbonate Precipitation for Hazard Mitigation and Ground Improvement

Dr. Edward Kavazanjian, Jr. is a Regents' Professor and the Ira A. Fulton Professor of Geotechnical Engineering at Arizona State University (ASU). He joined ASU in 2004 after 20 years in engineering practice. He is Director of the Center for Bio-mediated and Bio- inspired Geotechnics (CBBG), a National Science Foundation-funded Gen-3 Engineering Research Center dedicated to the emerging sub- discipline of biogeotechnical engineering. His expertise also includes geotechnical engineering for civil infrastructure systems, geotechnical earthquake engineering, design and construction of waste containment systems, and the mechanical properties of solid waste. In 2013, he was elected to the National Academy of Engineering and in 2018 he was elected a Distinguished Member of ASCE.



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.