

LESSONS FROM THE LIVES OF TWO DAMS
Civil Engineering Seminar

Professor James K. Mitchell
University Distinguished Professor Emeritus
Virginia Tech, Blacksburg, Virginia

Thursday, September 3, 2015
Hampton 1252, 2-3:20 pm
(with reception to follow in Wood Commons)

Many embankment dams completed during the first six decades of the 20th century have been found deficient relative their ability to resist currently anticipated levels of seismic shaking and probable maximum flood. In this lecture, two recent case histories are described. One is a hydraulic fill structure completed in 1920 that is founded on alluvial material, some zones of which are susceptible to liquefaction. The other is a zoned earthfill dam completed in 1956 that is founded over a channel filled with loose, uncompacted, hydraulically placed tailings from gold mining operations. Each dam has been upgraded in phases over periods of several decades using different strategies and ground improvement technologies to improve stability and reduce failure risks. Several take away lessons from these experiences concerning current risk mitigation strategies, the importance of correct soil and site characterization, and implementation and effectiveness of different ground stabilization and improvement methods are presented.

Prof. James K. Mitchell received his bachelor's degree in civil engineering from Rensselaer in 1951, and went on to earn his master's and doctoral degrees in civil engineering from MIT in 1953 and 1956, respectively. Prof. Mitchell continued his academic career, after serving for two years on active duty in the U.S. Army in the United States and Germany, by joining the faculty of the University of California, Berkeley in 1958. He served as the chairman of the Department of Civil Engineering from 1979-1984. He held the Edward G. Cahill and John R. Cahill Chair when he retired from the university in 1993. Mitchell joined the faculty of the Department of Civil and Environmental Engineering at Virginia Tech in 1994, and was named university Distinguished Professor in 1996, and University Distinguished Professor, Emeritus, in 1999. He remains active today both at the university and in numerous high-profile consulting projects and National Academy engagements. Prof. Mitchell has supervised the research of 76 doctoral students and authored 400 publications, including the recently updated graduate-level textbook and geotechnical reference, Fundamentals of Soil Behavior. Developing an understanding of soil behavior and applying this understanding to soil improvement and ground reinforcement, environmental geotechnics, in-situ measurement of soil properties, liquefaction resistance assessment and mitigation of risk during earthquakes, among many topics, has been a cornerstone of his career as a researcher. Prof. Mitchell has received many awards, including the Norman Medal, Thomas A. Middlebrooks Award, Walter L. Huber Research Prize, and the 2006 Outstanding Projects and Leaders Award (OPAL) in Education, all from the American Society of Civil Engineers (ASCE). In addition, he received the Medal for Exceptional Scientific Achievement from the National Aeronautics and Space Administration (NASA), the U.S. Army Corps of Engineers' Chief of Engineers Outstanding Service Award in 1999, and the Department of the Army Outstanding Civilian Service Medal in 2007. He has been a Rankine Lecturer and also a Terzaghi Lecturer. Prof. Mitchell is a member not only of the National Academy of Engineering but also of the National Academy of Sciences, a rare honor.