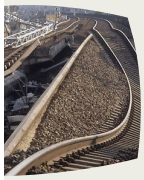

Presented By:
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Department of Civil and Environmental Engineering

Civil Engineering Seminar Series

Thursday, November 16th, 2017
MDEA
1:00PM - 2:00PM

Twenty-Two Years After Kobe & Six Years After Tohoku: A Japanese Way Toward Earthquake Disaster Mitigation

It was 1995 when Japan was hit by a devastating earthquake named 1995 Kobe earthquake. A scenery of collapses after collapses revealed that our cities were vulnerable with many existing stocks which were not constructed in most recent design and construction. Various efforts in both the public and private sectors were implemented after the earthquake to upgrade our old infrastructures and buildings as well as to make our construction technologies more advanced for the creation of stronger and more durable societies. A notable effort along this line was the construction and operation of a very large shaking table nicknamed E-Defense. The presenter served as the inaugurating director of E-Defense and supervised over forty full-scale or large-scale tests. A few representative tests are introduced, together with the backgrounds of those tests as well as with the difficulties associated with large-scale testing. Sixteen years have passed since 1995 Kobe; then Japan was severely hit again by a huge tsunami and earthquake named 1995 Tohoku earthquake. Thanks to the advancement of seismic design and construction, performance of buildings and infrastructural systems was generally satisfactory, but a huge rupture of faults generated an unprecedented tsunami disaster. The damage extended into a huge region also caused a new problem regarding overall recovery of the society. The word, resilience, has become a norm to overcome the Tohoku damage to prepare for the future. Among various efforts to this end, a national project that deals with quantification of "collapse margin" was conducted, in which the presenter served as the principal investigator. The project included collapse tests of a steel high-rise office building and a RC mid-rise apartment building. The tests also looked into the effectiveness of structural health monitoring in terms of the identification of damage location and severity. The outline and major results of the tests are summarized, and major findings are presented particularly in light of the importance of quantification of collapse margin before the earthquake and prompt assessment of damage immediately after the earthquake. In line with various research efforts, practice has also been promoted to realize more resilient societies throughout Japan. A few examples of recent very large-scale retrofit and renovation are also touched upon.

Masayoshi Nakashima is Professor Emeritus at Kyoto University, Japan. He earned his bachelor and master degrees from Kyoto University and Ph.D. from Lehigh University, the Unites States. After the doctoral study, he started working for the Building Research Institute (BRI) of Japan and then for Kobe University before joining Disaster Prevention Research Institute (DPRI), Kyoto University. His fields of research include seismic analysis and design of steel building structures and large-scale experimental techniques for the simulation of earthquake responses. Nakashima and his students have published about four hundred technical papers, nearly two hundred of them appearing in archived journals. He has earned various national and international awards, including the Best Paper Prize of AIJ (Architectural Institute of Japan), the Best Paper Prize of JSSC (Japanese Society for Steel Construction), the ASCE (American Society of Civil Engineers) Moisseiff Award (2000), the Special Achievement Award of AISC (American Institute for Steel Construction) (2009), the ASCE Ernest E. Howard Award (2013), and the EERI (Earthquake Engineering Research Institute) George W. Housner Medal (2014), among others. He is Member of the Engineering Academy of Japan and also inducted to Foreign Member of the National Academy of Engineering (NAE) of the United States. Currently, Nakashima serves as President of the Architectural Institute of Japan (AIJ) and President-Elect of International Association for Earthquake Engineering (IAEE). He also serves Editor of International Journal of Earthquake Engineering and Structural Dynamics (EESD). Currently, he serves as President of Kobori Research Complex (KRC) and as Counselor of Kajima Corporation. KRC is a research institution in close collaboration with Kajima.

Questions? - cee@uci.edu - (949) 824-7548