PURDUE UNIVERSITY | Lyles School of Civil and Construction Engineering

Purdue Chapter Earthquake Engineering Research Institute

STRUCTURES SEMINAR

Performance-Based Seismic Design: Current Approaches and Future Trends

By

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Abstract

Today's Performance-Based Seismic Design (PBSD) approaches focus on providing Life Safety for Design Earthquake (DE) ground shaking and Collapse Prevention for Maximum Considered Earthquake (MCE) ground shaking for the design of new buildings. An overview of this process will be presented. A FEMA-sponsored, Applied Technology Council-managed research effort has been underway for over 20 years developing a new approach to PBSD. The results of this effort have been published in FEMA P-58 Seismic Performance Assessment of Buildings. This portion of the presentation will focus on this new approach, which allows engineers to estimate the following loss information for their buildings:

- Repair costs
- Repair time
- Unsafe placards
- Embodied energy and carbon
- Casualties

Finally, the FEMA P-58 methodology has been extended to evaluate the time frame to achieve Functional Recovery, a new performance objective that is currently under development, which will also be discussed.

Biography

John Hooper is a Senior Principal and the Director of Earthquake Engineering at Magnusson Klemencic Associates, a consulting structural and civil engineering firm in Seattle, Washington. He received his Bachelor of Civil Engineering from Seattle University and a Master of Science from the University of California at Berkeley. John has over 40 years of engineering experience in the fields of renovation and earthquake engineering and has been involved in the majority of MKA's Performance-Based Seismic designs over the past 25 years. He is Past Chair of the American Society of Civil Engineer (ASCE 7's) Seismic Subcommittee, a member of ASCE 7's Main Committee, and Chair of the Building Seismic Safety Council (BSSC) NEHRP Provisions Update Committee. John has been a Member of EERI for nearly 30 years.