



## **NEES-EERI Webinar on Performance, Analysis and Design of Flexural Concrete Walls**

"The Performance, Analysis and Design of Flexural Concrete Walls" presented by Professors Laura Lowes and Dawn Lehman, both of the University of Washington, is the tenth in a series of Research to Practice Webinars co-produced by the Network for Earthquake Engineering Simulation (NEES) and EERI. It will take place Thursday, February 21st, 11:30 a.m. to 1:00 p.m. PDT. There is no cost to attend this webinar. To register go to <http://www.nees.org/webinar>. PDHs will be available from EERI after the webinar for \$30.

### **Abstract**

Structural walls are one of the most commonly used reinforced concrete seismic resisting systems. In mid-rise and taller buildings, walls are typically placed at the core of the building to frame elevators and/or stairs. As a result, core walls often have a flanged configuration with coupling beams linking the flanged walls and providing access to elevators, stairs or other elements located within the core walls. A research study sponsored by the National Science Foundation through the NEES research program, with supplemental funding provided by the Charles Pankow Foundation, was undertaken to investigate the seismic response of core wall systems. The study included integrated experimental and analytical research on planar, coupled and C-shaped walls. The talk will present research related to all three wall configurations. Experimental and analytical results will be presented with an eye towards specific design recommendations.

The experimental data generated as part of the current study were supplemented with data from prior research on RC walls and a large database of walls responding in flexure was developed. The results were used to evaluate common modeling procedures for walls using nonlinear beam-column elements. As walls are more susceptible to compression damage and may fail in a compression damage mode, specific recommendations for the regularization of the constitutive models are made. Regularized nonlinear models were used to investigate the earthquake response and collapse probability, per FEMA P695, of walls designed using current code procedures. Recommendations are made for improved design procedures to ensure desired failure modes and collapse probabilities are achieved. In addition, the research findings were used to develop seismic performance evaluation methods including fragility functions to distinguish between the performance of planar, non-symmetric and symmetric flanged walls.