Knowledge to Practice:

ACI Foundation Director's Holiday Greeting

Daugherty

The ACI Foundation has been investing its resources in people, research, and innovation for years, but to have more impact it was critical to obtain more funding. We reached an important point in our evolution in 2017, when we began our initiative to obtain a greater funding commitment from ACI. Through the efforts of Trustees and staff, the ACI Foundation secured a commitment of $500,000 annually from ACI to use in our mission: awarding additional and new types of student fellowships and scholarships, funding more concrete research, and supporting new industry technologies to overcome construction challenges. In addition, ACI will continue to cover all the administrative costs for the Foundation. This increased funding, new strategic plan, and revised governance positions the ACI Foundation for continued growth and success in supporting the ACI Strategic Plan and enhancing its vision of effectively meeting the needs of a changing world. The new funding model and ACI's financial support will ultimately benefit the entire concrete industry and end users of concrete.

The ACI Foundation relies on funding from ACI, ACI members, industry, current partners, and new future partners to maximize industry impact and we are grateful for their confidence in us.

As 2017 ends, the ACI Foundation extends its deepest gratitude to its supporters and donors, whose volunteerism and funding supported more student scholarships, more research, and more progress for the concrete industry than ever before. Over the last 2 years, the ACI Foundation has distributed 34 scholarships and fellowships to deserving students, funded eight new research projects, and invested in initiatives to advance the implementation of new technology. With the inclusion of our additional funding, we look forward to having more impact on the concrete industry in 2018.

Thank you again for your involvement with the Foundation. We wish you a joyous holiday season!

Ann Daugherty, ACI Foundation Director

CRC Announces New Research Product

CRC 71: *Modeling Parameters for the Nonlinear Seismic Analysis of Reinforced Concrete Columns Retrofitted Using FRP or Steel Jacketing* was completed this past October. The research was led by José C. Alvarez and Sergio F. Breña, both of the Department of Civil and Environmental Engineering at the University of Massachusetts-Amherst.

Procedures to construct backbone curves for existing components of frames (beams, joints, and columns) have been extensively researched over the years. Recommendations to construct backbone curves for retrofitted components, however, are largely lacking. This research project was designed to narrow this knowledge gap. The resulting report presents recommendations to construct backbone curves of circular and rectangular retrofitted columns using jacketing materials within the context of ASCE/SEI 41-13 and ACI 369R-11. The recommendations are based on the study of the characteristics of the hysteretic response of jacketed columns determined through past laboratory testing.

This project determined force and drift at yield, strength, and residual strength using two different methods. Force values at yield and peak strength were computed using accepted sectional models that use nominal material properties. The results from these models were compared with values extracted from tests of jacketed columns available in the literature. The residual strength was approximately defined as 20% of the peak strength. Drift values at the three key points were established from a statistical study of measured values of laboratory tests found in the literature. The drift data were fit to three different probability distributions and the one that best fit the laboratory data was used to construct fragility curves for plastic drift of jacketed columns. These curves were then used to propose the value of drift at the probability of exceedance of 0.5.

This research product can be used to develop backbone curves of jacketed columns using steel or fiber-reinforced polymer (FRP) jackets consistent with ACI 369.1-17 and ASCE/SEI 41-13. The results of this study could be used to facilitate future updates to various codes and standards by including nonlinear modeling procedures for jacketed columns. Additional information about this project, along with all CRC research projects and products, can be found at **www.acifoundation.org/research**.

Concrete 2029 and SDC Forum 43 Scheduled

Concrete 2029's next workshop will take place February 28, 2018, at the McCormick Resort in Scottsdale, AZ. SDC Technology Forum 43 will be held March 1-2, 2018, also at the McCormick Resort. Visit **www.concretesdc.org** for updates on the forum agenda, hotel information, and registration.

Visit the Foundation's New Website

www.ACIFoundation.org has recently undergone a renovation. Make sure to visit the website to see the new features and the latest ACI Foundation news and events, including current and past installments of *Knowledge to Practice.*