

## CIC-Hosted Technical Session at the ACI Concrete Convention

Hosted by the Concrete Innovation Council (CIC), the session “Innovations in Concrete” will be held on March 30, 2025, from 1:00 to 3:00 p.m. at the ACI Concrete Convention – Spring 2025 in Toronto, ON, Canada. The theme is “Implementing Low Carbon Concrete – From Innovation to Reality.” Presenters will share their experiences to benefit others who are invested in the future of sustainable construction.

Moderated by industry experts Glenn Schaefer, Atlas Technical Consultants, and Brad Malmsten, Thornton Tomasetti, this session will explore innovative solutions that address industry-wide challenges. Attend and contribute to meaningful discussions about the future of concrete.

The panel of distinguished speakers will include:

- Emily Kunkel, Associate Principal, Thornton Tomasetti, and Discussion Leader;
- Joel Ahearne-Ray, Senior Materials Specialist, Turner Construction Company;
- Tiffany Reed-Villarreal, Director of Sustainability Codes and Standards, National Ready Mixed Concrete Association (NRMCA);
- Larry Rowland, Sustainability Market Manager, Heidelberg Materials; and
- Robert Nussmeier, Vice President of Strategic Clients, Baker Construction.

The session culminates in a roundtable discussion, where the CIC, in collaboration with Thornton Tomasetti, will discuss pushing the boundaries of sustainability and low embodied carbon in concrete use. Multiple perspectives from specifiers, contractors, concrete producers, and material suppliers will highlight their respective approach, concerns, and progress in reducing embodied carbon.

What type of long-term testing is necessary? How should codes and standards evolve? How might these changes vary across different regions? These are a few of the thought-provoking questions that the roundtable aims to address. By fostering collaboration among industry professionals, the next steps necessary to advance innovation in the built environment responsibly and efficiently can be identified.

## 2025 Concrete Innovation Forum

The 2025 Concrete Innovation Forum will be held August 12-14, 2025, at the Hotel Clio, Denver, CO, USA. The focus will be on how new practices, materials, or inventions move from the lab to the field. Speakers will provide case studies and share the lessons they learned as they introduced new technologies to the industry. Available standards that provide entry for new materials will also be



Luna Lu speaking at the ACI Foundation’s 2023 Technology Forum in Portland, OR, USA

reviewed. In the afternoon, a panel discussion will focus on advances in nonmetallics, such as the current performance and work in progress for fiber-reinforced polymer (FRP) couplers. Local speakers will include representatives from the ACI Rocky Mountain Chapter, University of Colorado, and Colorado School of Mines.

The ACI Foundation is welcoming back Luna Lu, the newly appointed Vice President of the Office of Industry Partnerships for Purdue University, West Lafayette, IN, USA. Lu first presented for the ACI Foundation in 2023 as Founder and CEO of Wavelogix, a Purdue-rooted startup that developed the REBEL® concrete strength sensing system. The REBEL system uses direct mechanical measurements with piezoelectric sensors that are embedded into fresh concrete to measure the concrete’s strength levels in real time. This invention allows users to know when highway pavement is strong enough for traffic. At her previous presentation, Lu shared how the technology was developed and the results of numerous state trials with various concrete mixtures. This time, Lu will detail the lessons learned on the path from invention to innovation, including the development of a new national standard for estimating when freshly placed concrete is mature enough to withstand loads. Professor Lu has extensive experience as an academic leader, researcher, educator, and entrepreneur.

For more information, visit [www.acifoundation.org](http://www.acifoundation.org) or follow the ACI Foundation on LinkedIn for additional details and speaker spotlights.

## ACI Foundation-Funded Research Contributes to New ACI TechNote

The pivotal role of the ACI Foundation's funded research in advancing the concrete industry is illustrated by the research project titled, "Determination of the Curing Efficiency of Externally and Internally Cured Concrete Using Neutron Radiography," which culminated in the creation of ACI PRC-213.1-24: Curing Efficiency of Internally Cured Concrete—TechNote.

The research project, led by Principal Investigator Mehdi Khanzadeh Moradillo from Temple University, Philadelphia, PA, USA, and Co-Principal Investigator Jason Weiss from Oregon State University, Corvallis, OR, USA, was funded in 2020 and completed in 2021. It explored the curing efficacy of both externally and internally cured concrete using neutron radiography, a sophisticated technique offering high spatial resolution and precise quantification of the curing-affected zone (CAZ) through nonevaporable water content profiles.

The innovative findings from this research demonstrate that internally cured (IC) concrete can achieve similar curing results in approximately half the time. For example, instead of 14 days, only 7 days of wet burlap coupled with internal curing might be necessary to achieve the desired durability and strength in a bridge deck. This advancement not only reduces construction timelines—a critical factor for state highway agencies seeking to minimize public inconvenience and enhance construction zone safety—but also offers substantial cost savings.

The study examined eight different mortar mixtures, varying water-cement ratios ( $w/c$ ), and the inclusion of supplementary cementitious materials. Using neutron radiography, the research quantified the CAZ and determined that IC mixtures showed an increase in nonevaporable water content by 10 to 20% at the surface and 5 to 15% at the core compared to traditional mixtures. This enhanced water retention correlates directly to improved curing efficiency, particularly in mixtures where external curing duration is limited.

The ability of IC mixtures to significantly reduce CAZ thickness, especially in samples with shorter external curing durations, highlights the practical benefits of adopting these innovative practices. For example, IC mixtures with a  $w/c$  of 0.45 showed a reduction in the duration of external curing of 50 to 60%, a potential game-changer for construction efficiency.

The ACI Foundation's investment in research projects like this one is not merely beneficial; it is essential. Continued research to advance concrete will have direct applications that can revolutionize current practices, providing faster, cost-effective, and more sustainable solutions for the concrete

community. As the industry continues to evolve, such research will undoubtedly serve as a cornerstone for future advancements.

Visit [www.acifoundation.org/research](http://www.acifoundation.org/research) to view the final research report for this and all other ACI Foundation-funded research projects.

## Help Young Professionals Attend ACI Conventions

Young professionals often don't have the monetary support from their companies to attend conventions and conferences, but their involvement and ideas are important to our industry. To support young professionals who want to engage with the industry and their peers at ACI Concrete Conventions, you can donate to offset the Convention registration cost. Donations will boost the current Women in ACI Young Professional Registration awards, enabling more young professionals to attend ACI Concrete Conventions. Donate now at [www.acifoundation.org](http://www.acifoundation.org).

## Plan Your Legacy

Have you thought about the advancement of the concrete industry in the years to come? The ACI Foundation programs focus on building the future of the concrete industry and rely on organizations and individuals like you who want to pay it forward and give back to the industry that you helped advance and for which you have a passion.

- A gift to the ACI Foundation is an opportunity to invest in the next generation of leaders, new technical knowledge, and innovation.
- A gift to the ACI Foundation as part of your financial plan, whether through your estate, will, donor-advised fund, cash, stocks, bonds, insurance, or other retirement assets, will carry your technical legacy into the future of the concrete industry.

It's never too early to plan your legacy. To start the conversation, contact Kari Martin, ACI Foundation Fundraising Manager, at +1.248.848.3757 or [kari.martin@acifoundation.org](mailto:kari.martin@acifoundation.org).

## Tribute Donations

Honor the memory of someone who made a significant impact in your life with a tribute donation to the ACI Foundation. Your gift will preserve their legacy while also making a positive impact on the industry. A tribute donation lays the groundwork for a bright future while honoring the past. Donate online at [www.acifoundation.org/giving](http://www.acifoundation.org/giving).