



Photo: PCI

A Call to Action: The Industry Needs Us!

William N. Nickas, *Editor-in-Chief*

In my editorial in the last issue of *ASPIRE*[®] (Spring 2023), I noted that my daughter's science teacher had wrongly claimed that concrete is not a sustainable material. What struck me about my daughter's story was the way in which her science teacher took direct aim at any high-CO₂-emitting process and product as not being a sustainable construction practice or construction material. The teacher's message was that concrete's carbon footprint relative to the environment is not sustainable for the future. This manner of thinking—prioritizing embodied carbon over everything else, including public safety—is becoming increasingly popular.

In the same editorial, I shared Chris Lechner's outstanding letter to the editor of the *San Antonio Express-News* refuting many of the untruths circulating about concrete and sustainability. That letter struck such a chord with me. Finally, someone pushed back, and did so from a credible and knowledgeable position. I believe his letter exemplifies what we can—and should—say to the critics of our industry. I hoped these examples would jump-start a thought and seed the conversation, all with the goal of motivating everyone in our profession to share the complete story of concrete's sustainability in relation to the full service life of the structure.

As Emily Lorenz pointed out in a Concrete Bridge Stewardship article (*ASPIRE* Fall 2022), sustainability has three pillars—environment, economy, and society—and any full assessment of a project's sustainability must therefore consider the project's impact on all three. She and other sustainability experts are cautioning us to use good science for life-cycle analysis (LCA). However, some practitioners are now trying to reshape LCA studies, by focusing on and prioritizing just one aspect of environmental sustainability: cradle-to-gate embodied carbon. They are losing sight of the impacts that incomplete analyses and uninformed decisions can have on other

environmental issues, as well as on the other two equally important pillars, society and economy. We run the risk that decision-makers will lose sight of what an LCA *can't* measure—namely, the full array of social, economic, and environmental costs and benefits that will be associated with any infrastructure project.

For every major infrastructure investment, project, development, and environmental (PD&E) studies document and quantify the potential impacts and benefits, including evaluation of the “no-build” option. Pick up a 30-year-old PD&E study and take a young engineer or student to visit the built project. Try and imagine if the no-build solution had been selected. As the stewards of this nation's bridge construction projects, we need to make sure that stakeholders keep front of mind that bridges are essential for connecting communities and for moving people and goods quickly and efficiently, and that these social and economic benefits can be accomplished in environmentally responsible ways using concrete.

I am particularly concerned that the narrow focus on embodied carbon may come at the expense of public safety. In recent debates within some engineering bodies, it was implied that general civil and structural safety factors are too high and that seismic provisions use excessively long recurrence intervals—these views made my head explode! How can engineers contemplate and, worse yet, justify the notion that saving small amounts of materials to reduce the carbon footprint of projects is worth accepting a higher probability of structural failure and possibly fatalities? This type of absurd thinking could kill thousands—whether directly or by lack of timely response to emergencies—and it could stop construction of resiliency projects such as shore and scour protection, as well as seismic retrofit projects.

We need to address the environmental issues that we face. As engineers, it is our nature to be inquisitive. Although we often use classic and proven

Editor-in-Chief

William N. Nickas • wnickas@pci.org

Managing Technical Editor

Dr. Krista M. Brown

Managing Technical Editor Emeritus

Dr. Reid W. Castrodale

Technical Editors

Monica Schultes, Angela Tremblay

Program Manager

Trina Brown • tbrown@pci.org

Associate Editor

Thomas L. Klemens • tklemens@pci.org

Copy Editors

Elizabeth Nishiura, Laura Vidale

Layout Design

Walter Furie

Editorial Advisory Board

William N. Nickas, *Precast/Prestressed Concrete Institute*

Dr. Krista M. Brown, *Independent Consultant*

Dr. Reid W. Castrodale, *Castrodale Engineering Consultants PC*

Gregg Freeby, *American Segmental Bridge Institute*

Pete Fosnough, *Epoxy Interest Group of the Concrete Reinforcing Steel Institute*

Tony Johnson, *Post-Tensioning Institute*

Cover

Kraemer North America built the unique Park Road Bridge in Iowa City, Iowa, which includes a 10-ft-wide multiuse path and alleviates extreme flooding along the Iowa River. Photo: Kraemer North America.

Ad Sales

Jim Oestmann • joestmann@arlpub.com

Phone: (847) 924-5497

Reprints

lisa scacco • lscacco@pci.org

Publisher

Precast/Prestressed Concrete Institute

Bob Risser, President

If you need to update your contact information with us or have a suggestion for a project or topic to be considered for *ASPIRE*, please send an email to info@aspirebridge.org.

Postmaster: Send address changes to *ASPIRE*, 8770 W. Bryn Mawr Ave., Suite 1150, Chicago, IL 60631. Standard postage paid at Chicago, IL, and additional mailing offices.

ASPIRE (Vol. 17, No. 3), ISSN 1935-2093, is published quarterly by the Precast/Prestressed Concrete Institute.

<https://doi.org/10.15554/asp17.3>

Copyright 2023 Precast/Prestressed Concrete Institute.



American Segmental Bridge Institute



Epoxy Interest Group



Expanded Shale, Clay and Slate Institute



NATIONAL READY MIXED CONCRETE ASSOCIATION



Precast/Prestressed Concrete Institute



Post-Tensioning Institute

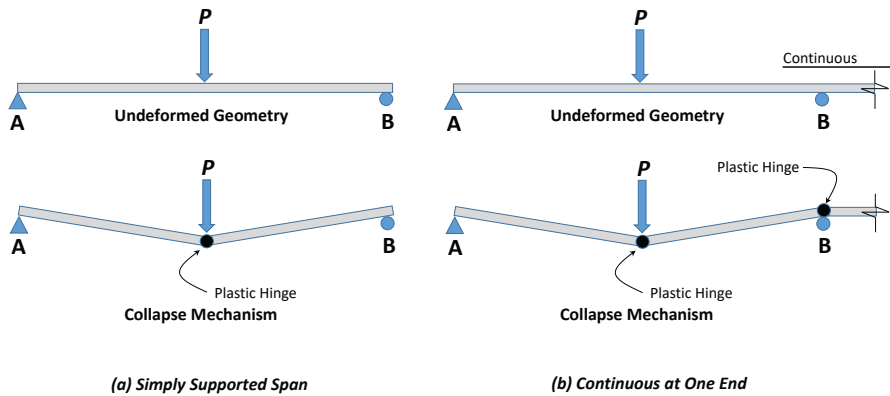


SILICA FUME ASSOCIATION

methods to solve today's engineering dilemmas, we also understand our environmental footprint and we pledge to use LCAs appropriately to optimize and reduce the cradle-to-grave impact of infrastructure projects. In fact, we have been incorporating life-cycle cost analysis (LCCA) into plan development for decades and understand these long-term investments. Moving forward, we will continue to methodically identify problems, incorporate rational mathematical explanations, and provide practical solutions that consider the whole puzzle—not just isolated pieces.

We are not averse to new technologies or techniques. Once they are proven, we absolutely

Fundamental structural behavior.



embrace them. Because we believe in innovation, our industry invests enormous resources in the research and development of new materials, technologies, techniques, methods, and procedures. For example, load- and resistance-modifier factors, which create uniform levels of safety, are critical concepts that engineers have spent decades improving. Please go back and carefully read Dr. Oguzhan Bayrak's concise articles on structural behavior in the Summer 2020, Winter 2021, and Spring 2021 issues of *ASPIRE*. The engineering concepts and engineering judgment now rooted in design specifications should always uphold our ethical duty to society for safety. The notion that we should revisit the safety margins that

are embedded in our structural codes is extremely upsetting to me, as it should be to you.

LCCA, sustainability, and resilience are not new concepts, and yet I feel like we are in a constant battle to defend the tried-and-tested structural theorems of our profession. It is apparent that we are not doing a good enough job telling our robust story. Conversations that dismiss the performance characteristics and measurable successes of our built projects do us a disservice. The beauty of concrete is its sustainability. This is our most resilient story!

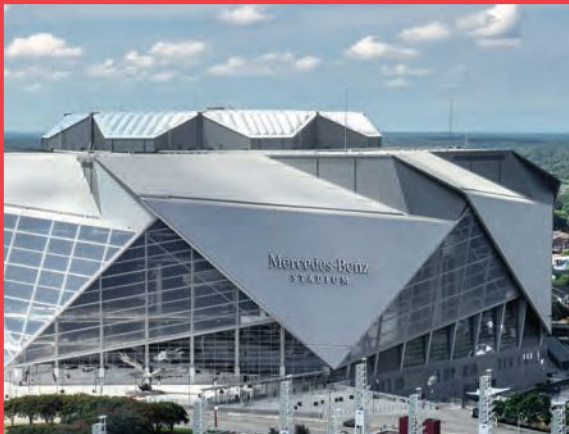
To learn more about the topic of structural behavior, see Dr. Oguzhan Bayrak's *ASPIRE* articles at the following links:

<https://www.aspirebridge.com/magazine/2020Summer/Perspective-PerspectivesOnStructuralBehaviorAndRedundancy.pdf>

<https://www.aspirebridge.com/magazine/2020Summer/AASHTO-LRFD-ColumnTiesForNonseismicApplications.pdf>

<https://www.aspirebridge.com/magazine/2021Winter/Perspective-RedundancyAndDuctility.pdf>

<https://www.aspirebridge.com/magazine/2021Spring/Perspective-PerspectivesOnStructuralBehaviorAndRedundancy.pdf>



Mercedes-Benz Stadium, Atlanta, GA

Form + Function = Fantastic

For more than 56 years, Hamilton Form has been helping the precast community achieve stunning results with our custom, highly-engineered steel forms.

It's all we do.



Hamilton Form Company

Custom forms
Custom equipment
Practical solutions
www.hamiltonform.com
sales@hamiltonform.com
 817-590-2111

Follow us:

