EDITORIAL

Photo: PCI.

A strong and bright vision of our future

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

In this editorial, let's peer into a kaleidoscope to see the future of versatile and resilient concrete bridges. That suggestion may seem whimsical, but let's imagine that all the choices we have for robust concrete construction are the pieces of glass that shift within the kaleidoscope (our industry). When viewed individually, these pieces may be attractive, but it is the visions they create when viewed together that are truly inspiring.

Recently, views within our kaleidoscope have been enhanced by adding new pieces to the mix, in the form of numerous technological advances, such as cement substitutes to densify concrete and improve the durability of bridges; new types of corrosion-resistant nonprestressed reinforcement and prestressing strand; higher strength strands (300 ksi); and larger strands (0.7 in. diameter). Strong evidence is helping us justify approaches such as migrating corrosion inhibitors for both old and new structures (see the Concrete Bridge Preservation article in the Winter 2019 issue of *ASPIRE*®). And the Federal Highway Administration is funding projects on the implementation of post-tensioning systems with electrically isolated tendons in the U.S. (see the Concrete Bridge Technology article in the Spring 2019 issue of *ASPIRE*).

As you acquaint yourself with organizational changes in Chapter 5 of the 8th edition of the American Association of State Highway and Transportation Officials' *AASHTO LRFD Bridge Design Specifications*, notice the prominence of the strut-and-tie specifications. The changes demystify the use of an age-old tool, while using modern parameters. Let's embrace the mainstreaming of the strut-and-tie method without losing sight of durability advancements. The tube of the kaleidoscope may be a tunnel of sorts, but we must avoid tunnel vision—always look at the whole solution with multiple design features and limit state checks.

In 2019, we witnessed major milestones. Notably, record-breaking span lengths were constructed and some states used more concrete than ever before. This issue of *ASPIRE* features photos of the longest-known single-piece pretensioned, precast concrete girder (see the Creative Concrete Construction article on page 56). When I saw the pictures, I had to tip my hat to the team that created this "Oh my goodness moment." Meanwhile, in other states, shallow concrete spans are providing new efficiencies in bridge construction (see "Minnesota's MH Shape" in the Summer 2019 issue of *ASPIRE*).

As we develop thinner and longer beams, handling must be a bigger part of our design process. When all aspects of handling are designed into the solution, designers and builders gain an advantage. Eliminating overwater construction activities reduces labor costs, and these experiences teach us important lessons about connections and geometry. For example, I encourage you to consider the insights shared in the article on the construction of the Pensacola Bay Bridge in the November-December 2018 issue of *PCI Journal,* as well as lessons from"Calculations for Handling and Shipping Precast Concrete Deck Panels" in the Winter 2019 issue of *ASPIRE*.

In two years or so, when AASHTO ballots the first guide specification (materials, design, and construction) for bridge components built with ultra-high-performance concrete (UHPC), we can expect a renaissance for concrete bridges. Incremental changes in the concrete materials combined with reinforcement advancements have made high-performance concrete bridges the norm. In the next decade, UHPC specifications will provide the opportunity to again rethink the norm.

Let's start strategic discussions about using hybrid designs for concrete structures. In the November-December 2019 issue of the *PCI Journal*, there will be a story about long-span hybrid precast concrete bridge girders using UHPC and normalweight concrete. The authors share a critical look at many aspects of this innovative concept.

As we move forward, we must stay vigilant and verify that we're seeing the complete picture, not just snippets of data. Stay in touch with our industry partners as the colors of the kaleidoscope combine to create a strong and bright vision of our future.

Cover
Concrete Technology Corporation (CTC) and the design-build team of Atkinson Construction and Jacobs have partnered in Tacoma, Wash., to produce the longest single-piece prestressed concrete girder made in the U.S. for the Washington State Department of Transportation (WSDOT). See page 56. Photo: CTC. Inset photo: WSDOT.

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