

Bridging the Gap

The newly formed Concrete Bridge Engineering Institute aims to fill the need for hands-on training of bridge design and construction industry professionals

by Monica Schultes

To build better, longer-lasting bridges, we turn to concrete. But how do we enable the concrete industry to achieve success on every project, at every stage?

The mission of the newly formed Concrete Bridge Engineering Institute (CBEI) in Austin, Tex., is to serve the concrete bridge community as the leading resource on the industry's most pressing issues. CBEI seeks to accomplish this mission through extensive collaboration and training across a wide range of concrete-related topics.

This massive undertaking to further the design, construction, and maintenance of concrete bridges is long overdue. To solve the infrastructure problems that plague every state, work needs to start now. The place to go for help will be CBEI.

Initially, the infrastructure for CBEI will be primarily located within the University of Texas at Austin. CBEI will work closely with existing groups and resources at the university such as the Ferguson Structural Engineering Laboratory, the Laboratory for Infrastructure Materials Engineering, the Smart Structures Research Group, and the Mechanics, Uncertainty, and Simulation in Engineering Group. CBEI will also engage subject matter experts and resources at other universities and elsewhere.

The CBEI framework will allow extensive collaboration across the design, construction, and concrete supplier industries in the effort to design, replace or repair bridges in the United States. This national resource will offer something for everyone in the concrete bridge community. Industry veterans, as well as newcomers and recent graduates, can benefit from training opportunities.

Born of Necessity

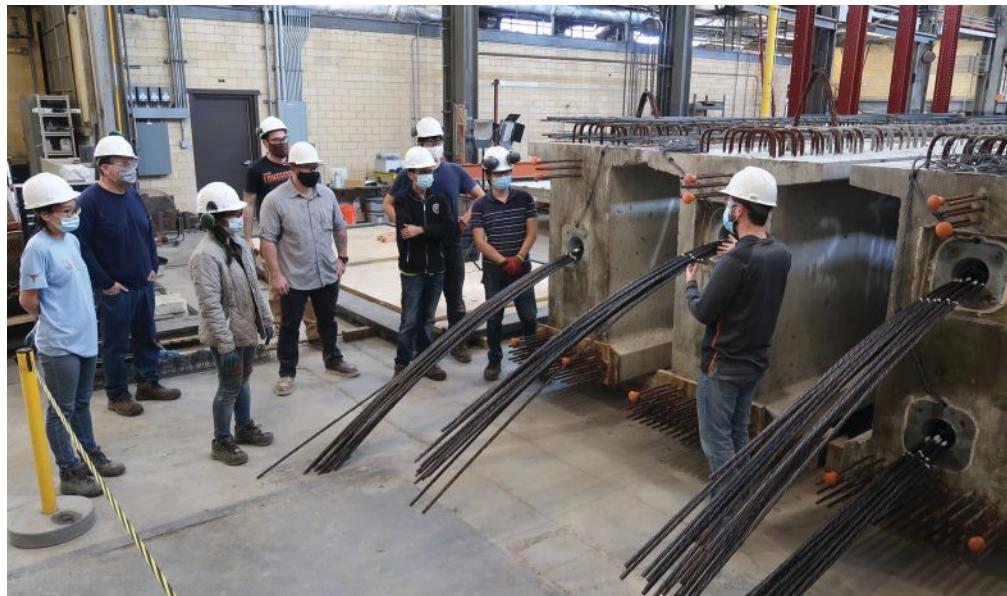
Oguzhan "Ozzie" Bayrak, professor of structural engineering at the University of Texas at Austin, is leading the efforts to make CBEI's mission a reality. In his opinion, the challenges we are facing in the United States related to infrastructure are immense—as are the opportunities. Now is the time to ramp up the workforce to make the most of billions of dollars of highway construction in the pipeline.

As the industry works toward more resilient infrastructure, and with help from the Infrastructure Investment and Jobs Act at the national level, best practices need to be reviewed, and knowledgeable engineers and technicians need to be engaged at every phase of design and construction.

The CBEI training center will fill the need for hands-on training of construction industry professionals.

The proposed Concrete Bridge Engineering Institute's Post-Tensioning Academy will provide hands-on experiential learning about all aspects of post-tensioning systems: system details and layout, specifications, installation, tensioning, grouting, testing, inspection, remediation, and new technologies. All Photos: The Concrete Bridge Engineering Institute and Ferguson Structural Engineering Laboratory at the University of Texas at Austin.

Many professionals skip or hurry through training or educational opportunities because they think that their experience will see them through this new wave of work. However, lack of training can lead to errors or to the best solutions being overlooked. There is a need for the transfer of in-depth knowledge that cannot be found in a webinar or a how-to video, and for experts to train the trainers of the next generation of professionals on the latest materials and technology. For example, the Texas Department of Transportation estimates that 1000 inspectors would benefit from the bridge deck construction certification, and an equal number of consultants would also require this training for their anticipated work. To understand the correct procedures, it is crucial to be able to visually observe and participate in the processes in person. That in-person component cannot be fully duplicated through a webinar.





With bridge decks a top priority, state departments of transportation are expected to welcome the Bridge Deck Construction Inspection Program. The Concrete Bridge Engineering Institute will use full-scale components to simulate the hands-on inspection of decks as well as review best practices.

CBEI will also operate as a clearinghouse to identify promising new materials and technologies and to share best practices from other countries or states. For example, where can contractors learn about the proper installation of electrically isolated tendons, which are just entering the marketplace? At the CBEI, they will get a level of instruction that does not currently exist anywhere else in the United States.

The preceding examples are real, significant needs, and they represent just a few of the knowledge gaps that need to be filled.

The First Three Pillars of Learning

Based on the needs articulated by state and federal agencies as well as industry professionals, CBEI will focus initially on three areas, or "pillars of learning," with

provisions for future topics. The first pillar is the Concrete Materials Academy. Its launch date is set for January 2023, when the first classes will be offered. The second and third pillars are the the Bridge Deck Construction Inspection Program and the Post-Tensioning Academy. The Bridge Deck Construction Inspection Program and Certification will begin in September 2023, with the Post-Tensioning Academy following shortly thereafter in January 2024.

These areas of concentration were gleaned from industry input. States identified bridge deck construction as their number one interest, while industry professionals also face challenges with post-tensioning and grouting details and techniques. Each program will be a stand-alone offering, so practitioners can choose the course or courses that best suit their needs.

The Concrete Bridge Engineering Institute's Bridge Component Library will contain actual bridge components as well as samples from research projects. These full-size pieces taken from bridges that have been removed from service will be used for training and demonstrations, and to illustrate problems and their solutions.



The Concrete Bridge Engineering Institute training center is starting to take shape in Austin, Tex., with the construction of support slabs for the new facilities that will house the institute, including the Concrete Materials Academy, which is slated to open in January 2023.

Continuing Education

While there is a plethora of continuing education opportunities for industry professionals, it is often difficult to match high-quality learning experiences accompanied by hands-on training with the right audience. CBEI plans to fill that gap for the concrete industry. Its efforts will supplement the ongoing efforts of groups such as Precast/Prestressed Concrete Institute, the Post-Tensioning Institute, the American Segmental Bridge Institute, and the Federal Highway Administration.

This is the first article in a planned series of articles exploring the potential impact of CBEI on the construction industry and the nation's infrastructure. An article in the next issue of *ASPIRE®* will explore how the pooled-funding approach can be used to initiate and sustain CBEI programs. □

