

# An Update on the Concrete Bridge Engineering Institute

by Dr. Oguzhan Bayrak and Gregory Hunsicker, Concrete Bridge Engineering Institute

The Transportation Pooled Fund (TPF) for the Concrete Bridge Engineering Institute (CBEI) officially started in June 2023. Representatives from the 10 members of CBEI's Technical Advisory Committee recently participated in a kick-off meeting that was facilitated by the lead agency, the Texas Department

of Transportation, and covered topics including introductions, scope, and schedule. The Technical Advisory Committee includes representatives from the Federal Highway Administration and state transportation agencies that are members of the TPF. Following the kick-off meeting, task groups are being

formed to work on providing essential input into the planning and development of the various components.

The current CBEI schedule aims for the Concrete Materials for Bridges program to commence in early 2024, with instruction by Dr. Kevin Foliard, Dr. Thano Drimalas, and visiting instructors. The program will engage participants in group projects, tours of outdoor concrete durability exposure sites, and other activities, as outlined in the Winter 2023 issue of *ASPIRE*<sup>®</sup>. The launch of the Bridge Deck Construction Inspection program is scheduled for late 2024 (for program content see the Summer 2023 issue of *ASPIRE*). Dr. Elias Saqan recently joined CBEI and is primarily focused on the Bridge Deck Construction Inspection program. He is an excellent addition to the team and we are excited to have him on board. The Post-Tensioning Academy is scheduled to be available in late 2025. The CBEI TPF is scheduled to run through May 2027, after which time CBEI and these programs are expected to be self-sustaining.

Figure 1. Wick-induced bleed testing of freshly mixed grouts. On the left is a grout with excessive bleed water that failed the wick-induced bleed test. On the right is a grout with little bleed water that passes the wick-induced bleed test. Demonstrations such as this will be part of the hands-on training at the Concrete Bridge Engineering Institute. Photos: Concrete Bridge Engineering Institute.



Hands-on learning is critical to all three pillars of CBEI—concrete materials, bridge deck construction inspection, and post-tensioning. CBEI staff, through their formal education and professional experience in teaching, understand the value of hands-on learning in engineering education and, in particular, bridge engineering. For example, those of us who participated in the American Segmental Bridge Institute's (ASBI's) Grouting certification classes and the Post-Tensioning Institute's (PTI's) Levels 1 & 2 Multistrand and Grouted PT curriculum have witnessed firsthand the importance


of hands-on learning and the impact that it has on students and trainees.

One of the key topics taught during post-tensioning grouting instruction is the issues that can be caused by the development of bleed water and the resulting voids and/or intermediate bleed lenses. The importance of using an engineered zero-bleed grout, such as a prepackaged propriety mixture, and using the correct water addition (never exceeding the maximum amount of mixing water) are covered extensively and stressed throughout all grouting classes. One of the most effective demonstrations to convey this point is performing a wick-induced bleed test on two types of grout (Fig. 1). In our case, a Class C prepackaged proprietary zero-bleed grout and a Class A cement-water grout were mixed and tested alongside each other. Within three hours of the mixing, excessive bleed water was identified within the Class A cement-water grout, whereas minimal bleed water was exhibited by the Class C prepackaged

proprietary zero-bleed grout. Seeing the bleed water accumulate in real time was impactful and memorable.


To bring positive aspects of hands-on learning into the CBEI curriculum, the programs will emphasize engagement, accelerated learning, retention, and assessment. Interactive demonstrations and group exercises are designed to engage attendees and create an enriching environment with team interaction. Accelerated learning is provided by simulating real-world examples using a variety of procedures and demonstrating common defects, which effectively compresses years of field experience into short modules. Impactful demonstrations are designed to illustrate key concepts that participants will remember and retain long after the course. Practical field assessments will measure attendees' understanding of topics, especially as they relate to certification programs. As CBEI staff, we are keenly aware that

the agencies contributing to the pooled funding of CBEI also place high value on hands-on learning.

Special recognition and many thanks go to the participating agencies that have made this effort possible: the transportation agencies of Texas, Colorado, Florida, Georgia, Iowa, Michigan, Minnesota, Pennsylvania, and Utah, and the Federal Highway Administration. Thanks also go to our industry partners for their continued support and engagement: ASBI, PCI, PTI, and the members of the National Concrete Bridge Council. 

*Dr. Oguzhan Bayrak is a chaired professor at the University of Texas at Austin, where he serves as the director of the Concrete Bridge Engineering Institute. Gregory Hunsicker is a research engineer at the University of Texas at Austin and deputy director of the Concrete Bridge Engineering Institute.*






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