

It's all about **the people**

Mason Nichols



Growing up in Mexico City, Mexico, Sergio Breña likely had little idea how much of an impact he would have on the precast concrete industry. Breña, who serves as a professor and head of the Civil and Environmental Engineering Department at the University of Massachusetts Amherst, attended Universidad

Iberoamericana in Mexico City, where he earned his bachelor's degree in civil engineering. After a brief stint working a construction job, though, higher education called Breña back.

He applied to several universities in the United States, ultimately choosing to attend the University of Texas at Austin. When he applied in the late 1980s, UT Austin was one of the top schools in the country for concrete studies. This served as the catalyst for Breña's interest in working with concrete, including prestressed and reinforced concrete structures.

Breña earned his master's degree at UT Austin and then went on to perform consulting work for more than half a decade, first with a firm in Mexico and later with his own small practice. Still, despite his success with these businesses, Breña recognized that academia was the right path for his career. He returned to UT Austin, where he obtained his doctorate in civil engineering, before landing at UMass Amherst in 2000.

Early in his UMass Amherst tenure, Breña began seeking industry connections to offer guest lectures during his courses. This search connected him with Rita Seraderian, who at the time was the executive director of PCI Northeast. Establishing a relationship with Seraderian proved critical to Breña's career trajectory, kickstarting his involvement with PCI. Soon after the lecture, Seraderian invited Breña to attend a PCI convention in Atlanta, Ga. That trip launched two decades of active involvement that would take him from student outreach to shaping design standards in Massachusetts and beyond.

Breña's first contribution to PCI was on the Student Education Committee. He would eventually serve as chair. Since then, Breña has worked with several other PCI committees, thanks in large part to connections he made through PCI.

Helm Wilden, a PCI Fellow, PCI Titan, and recipient of PCI's Medal of Honor, invited Breña to serve on the Blue Ribbon Review Committee for the eighth edition of the *PCI Design Handbook: Precast and Prestressed Concrete*. The committee is charged with performing a peer review of the handbook before a new edition is published. He currently serves on the Industry Handbook Committee for the ninth edition

of the *PCI Design Handbook*, as well as the Design Standard Committee. Beyond committee work, Breña's other contributions have included developing two courses for the PCI academy, Basic and Advanced Prestressed Concrete Design; teaching various PCI courses; and actively promoting precast concrete research and education throughout the Northeast.

"My involvement with PCI has been instrumental," Breña says. "It's been very important for my career advancement and to develop a strong network of collaborators over the years."

Seraderian, who served as the foundation for building Breña's network, was instrumental in securing and bringing to life one of his proudest accomplishments. Around 2014, Breña began working heavily on research projects with the Massachusetts Department of Transportation (MassDOT). MassDOT was interested in innovative techniques in accelerated bridge construction, and it just so happened that Seraderian played a major role in the development of NEXT beams (northeast extreme tee beams), which are essentially heavy double tees specifically designed to accelerate fabrication and construction of medium-span bridges.

At the time, NEXT beams were not part of the American Association of State Highway and Transportation Officials' *AASHTO LRFD Bridge Design Specifications*, but because one of the bridges being constructed in the state included the NEXT beams, there was an interest in developing live-load distribution guidance for their use. MassDOT thus partnered with Breña, UMass Amherst, and PCI to develop an instrumentation plan for the bridge that would measure its performance. Data from the bridge was collected over the course of several years. Eventually, it was used to develop the state's live-load distribution guidance for bridges constructed with NEXT beams.

Looking forward, Breña is excited about how concrete mixtures can be adapted to limit carbon emissions. He wants to help spread the word that although concrete is already a sustainable building material, it can be made even more environmentally friendly through additional research and development.

No matter what the future brings, Breña will continue to attribute his success to the people who have helped mold him: his family, the team at UMass Amherst, and, of course, his network of PCI contacts.

"Every single person I've met through PCI is very open and accommodating," he says. "It's a community. It's just really a very, very strong community of people who have dedicated their lives to this profession." **D**