



The Route 52 Causeway project in New Jersey will incorporate precast, prestressed and post-tensioned concrete I-girder spans over each main channel of the 2.8-mile-long continuous bridge.

panels, since shear studs did not have to be installed and grout pockets did not have to be filled," Deschenes explains.

Focus on Constructability

This work also exemplifies Baker's focus on constructability, which can significantly reduce costs, especially the most important one: the final cost after all changes are totaled up. "We commit our senior people to our complex projects to ensure we are looking at the project from the contractor's perspective," says Dietrick. The Fulton Road Bridge involved many constructability factors, including how the arches could be transported within the zoo, how they could be

lifted, what crane access existed, and how the construction would impact zoo accessibility.

"You need people who have been through the battles and can see the contractor's needs before a set of plans hits the street," Dietrick says. "If these factors aren't thought through, significant change orders and claims can result, as the contractor adapts to field conditions that weren't considered."

Also aiding their value-engineering approach are software programs they have created, as well as their inspection processes. Baker, in fact, provides training

for state inspectors across the country under contract with the Federal Highway Administration and offers design courses in load and resistance factor design to state DOTs through the National Highway Institute. "Being on the ground floor with these programs allows us to better understand our clients' perspective and needs, which ultimately enhances our ability to help them in making decisions," Dietrick says.

These support services can be seen in projects such as the Pomeroy-Mason Bridge connecting Ohio and West Virginia, a cast-in-place concrete cable-stayed bridge that replaced an existing

Aesthetic Impact and Sustainability

Aesthetic considerations are growing in importance as owners receive more feedback from users, John Dietrick of **Michael Baker Jr. Inc.** notes. "In the past, agencies' decisions were not as influenced by public outreach as they are today. Now, there is much more involvement from the public side, and it creates real challenges to balance all of the needs." It also brings new skills into the mix, he adds. "As engineers, we weren't trained to sell project benefits to the public, but we now have to think in those terms and make presentations that explain the project from the public's perspective."

The public's growing interest in the ramifications of bridges on the community also is generating more interest in minimizing the environmental impact of projects and maximizing sustainable design concepts. "Clients still want sustainability in their projects, but they want it at a reasonable cost," adds White. "With the information we

glean from our experience around the country, we can give them the information they need to decide which way to go."

The impact that aesthetics can have can be seen in a design by Baker for the Pennsylvania Department of Transportation for the Hickory Street Bridge in Warren, Pa. The new 500-ft-long crossing of the Allegheny River replicates and replaces an existing concrete-spandrel arch structure. The replacement bridge, consisting of four 129-ft-long prestressed concrete box-girder spans, features aesthetic lighting, architectural railings, and façade panels. It also includes ornamental concrete balustrades and scenic observation alcoves in anticipation of significant pedestrian use. "The aesthetic features of this structure were added at a minimal additional cost to the overall project," says Dietrick.



The Hickory Street Bridge in Warren, Pa., replaced an older concrete spandrel arch bridge with four prestressed box-girder spans that replicated the original look and included period lighting, architectural railings, and façade panels.