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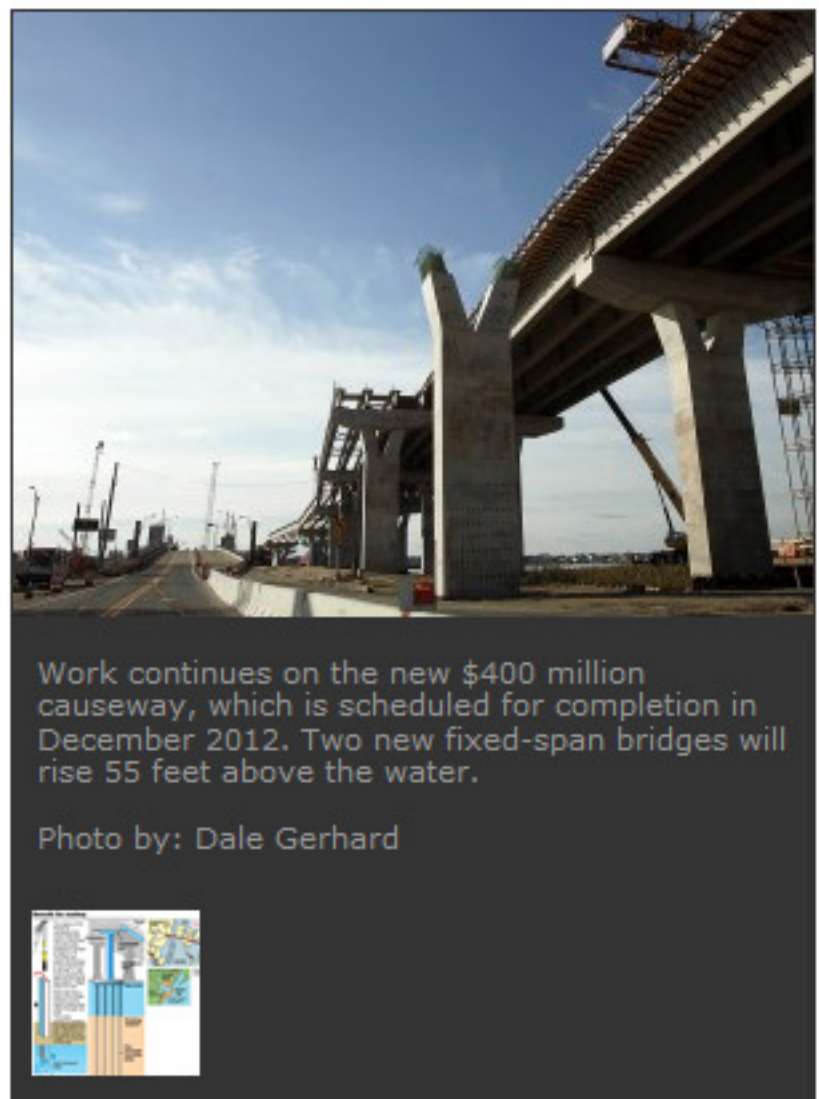
# Route 52 causeway isn't just New Jersey's largest construction project, it's an engineering marvel

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By MICHAEL MILLER Staff Writer | Posted: Sunday, November 14, 2010



Work continues on the new \$400 million causeway, which is scheduled for completion in December 2012. Two new fixed-span bridges will rise 55 feet above the water.

Photo by: Dale Gerhard



With related story and a photo gallery of work on the causeway

The skeletal Route 52 causeway has started to resemble a highway overpass, with its miles of structural concrete and sleek, uninterrupted lines.

But once completed, it will be a "ribbon in the sky," says the Mercer County company that designed it, Michael Baker Jr. Inc., of Hamilton Township.

Aesthetic details are coming to life in the second stage of construction on the \$400 million causeway, the state's largest transportation project and one of the most ambitious ever in southern New Jersey. Twin two-lane spans will replace the four low bridges that made up the old causeway connecting Ocean City and Somers Point.

Click here for the photo gallery

The new causeway, to be completed in late 2012, will replace two drawbridges with tall, fixed spans 55 feet over the water.

To appreciate its massive scope, consider its materials: 8,000 tons of rebar, 300 million tons of concrete, 47 miles of

electric cable and — if laid end to end — enough structural piling to stretch from Ocean City to Cape May.

"It changes the whole view of the bay crossing. The bridge will have some nice lines to it, arcing high into the air to get over the navigable channels," said Daniel Lord, the resident engineer and consultant for the state Department of Transportation.

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The bridge will offer many amenities for people in both Atlantic and Cape May counties. Bicyclists and pedestrians were forbidden to cross the old causeway, which has virtually no shoulder and no sidewalks. The new bridge will have a 10-foot wide bike path.

"What is that, two miles? That's going to be a good walk," Somers Point Mayor Jack Glasser said.

"You don't know what it's going to look like until it's over. People are trying to put up with the little inconveniences now. I'm just looking forward to it being completed."

### What's gone, what's new

For drivers, the biggest attractions might be what the span will not have: Nobody will have to wait for the twin drawbridges to creak open every half-hour to let boats pass, or worse, detour to Longport or 34th Street because of the dilapidated Ninth Street bridge mechanism's annoying but consistent habit of getting stuck open in the summer heat.

The entry to Ocean City will no longer have a hairpin turn that threatens to scrape paint off buses, recreational vehicles and heavy trucks whenever drivers find themselves sharing the two lanes.

And the bridge will no longer have a confusing mid-span traffic light that stops drivers for no obvious reason. In addition, this traffic-thinning light will be unnecessary now that the Somers Point traffic circle is gone.

Almost every detail of the bridge was designed to serve a public function, from its two boat ramps and four fishing piers to its pedestrian and bicycle path and its many balconies that will give joggers and bikers a chance to rest and enjoy picturesque views of the Great Egg Harbor Bay.

"It's going to be a great result," said Michele Gillian, director of the Ocean City Regional Chamber of Commerce. "Now it's in the uncomfortable stage of the project. Lanes are being closed off during the day. Transportation is being moved from one side to the other. Sometimes you have to step back a little to get ahead."

A model mock-up of the bridge is in the chamber's temporary visitor center on Ninth Street. During the summer, the bridge was a regular topic of discussion among tourists. Residents have fewer questions, she said.

The new causeway will feature a new two-story, \$2 million visitor center that resembles the old Ocean City Yacht Club. It will boast a porch with panoramic views of the bay and marshes.

And Somers Point will keep a piece of the old causeway: One of the two bridge-tender towers that operators use to raise and lower the draw spans. These are expected to become architectural curiosities as New Jersey replaces the last of its old drawbridges with fixed spans, Gillian said.

The new causeway offers other design features that are less obvious, such as hammerhead piers shaped like the letter Y that provide more space and light beneath the bridge and cut material costs in the foundations.

And engineers reduced the number of joints linking the concrete slabs. These are the weak points on a bridge and are subject to expanding and contracting in the heat and cold.

The bridges, as originally designed, also created an optical illusion that they were askew in places. The alignment was adjusted to give the twin spans a more aesthetically pleasing and smoother geometry, project manager Dave Lambert said in an e-mail.

And at night the bridge piers will be lit with decorative LED lights controlled from the Visitor Center to change colors for the holidays or special events.

### A complex project

About 100 people were involved in every aspect of the bridge's design, including 15 sub-consulting firms. About 400 employees and contractors with George Harms Construction worked on the first half of the project. About 500 more are working on the second and final stage for contractors R.E. Pierson Construction Co. and G.A. & F.C. Wagman Inc.

Since the construction site is surrounded by water, homes, a busy road and sensitive marshland, there is little room for materials or equipment. Instead, the materials must be brought in as needed, requiring a great deal of choreography between tugboats, barges, heavy trucks and cranes, said Russ Driskel, field engineer for Wagman. The contractors even built a massive temporary bridge to accommodate cranes where the bay is too shallow for barges, he said.

"It's so complex. It presents a challenge every day," Driskel said. "Planning is important — being prepared for every aspect of the project."

Complicating construction, about 60 percent of the bridge is being built from the water using crane barges, some of which weigh 300 tons. The barges alone cover more than 2 acres of water around the causeway.

Ninth Street routinely floods during extraordinary high tides or modest storms. The new bridge ramp into Ocean City will be at least 12 inches higher all the way to West Avenue. This, along with drainage improvements, should keep Ocean City's busiest exit open during all but the worst coastal storms, the state said.

Cape May County Engineer Dale Foster said the new causeway will blend in well with other spans such as the Ocean City-Longport Bridge and the Somers Point-Longport Bridge.

"In coastal areas, they always build a concrete bridge," he said. "It's not unique to New Jersey. In places such as North Carolina, you'll find them building bridges like this."

New Jersey bridge designer James Maccariella said engineers have to consider the ease of construction, particularly in a congested marine environment.

"It's one thing to specify a bridge type. But you have to consider how you will deliver a bridge to the site," he said.

Maccariella designed bridges for 18 years and now teaches at Mercer County Community College. The project was presented at a recent international bridge convention he attended in Pittsburgh.

Maccariella said the span might have surprising curb appeal. "I think it will be a good-looking bridge," he said. "Beauty is in the eye of the beholder. Maybe it will be the new icon for Ocean City."

Whether the bridge will live up to its aesthetic promise as a "ribbon in the sky" remains to be seen. But commuters are eager now to cut the ribbon on the project, scheduled for completion in December 2012.

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### Route 52 by the numbers

- 2.5: Distance in miles the span stretches
- 3: Miles of drainage pipe
- 75: Bridge's functional life span in years
- 80: Designers who worked on the drawings
- 100: Companies that provided materials
- 115: Wind speeds the bridge can withstand in miles per hour
- 900: Construction workers who worked on it
- 1,083: Distance in miles between Ocean City and Shawnee, Kan., which provided the structural steel
- 8,000: Tons of rebar supporting the concrete
- 300 million: Tons of concrete
- 250,000: Feet of electric lines used on the bridge

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