

PROJECT SPOTLIGHT

New precast concrete dock revives local economy

Neah Bay, Wash., is part of the Makah Reservation. Members of the tribe rely on fishing from the dock for their livelihoods. However, the existing 65-year-old dock had become so dilapidated that semitrailers were no longer allowed to load directly from the end of the dock, where the fishing vessels were. Instead, the fish had to be forklifted over the dock.

A new dock was critical to the long-term viability of the tribe's commercial fishery, which generates more than \$10 million in revenue.

"The fish dock is the only economy in that area for the tribe," says T.J. Schilling, project engineer for BergerABAM in Federal Way, Wash., the prime consultant on the new dock project.

BergerABAM elected to use precast concrete for the new dock and trestle. "By using precast, we were able to design and build a new trestle and dock within one year," Schilling says. Precast concrete was chosen for the project for several reasons.

First, Neah Bay is at the far northwestern point of the contiguous United States. "There isn't really much there, and the nearest batch plant is two hours away in Port Angeles," he says. "So getting wet concrete to the site would involve a two-hour trip, plus site time, pumping and pouring, boating it off land out to the dock, and then dropping it into place."

Second, Schilling says, the area is lacking in skilled labor that is trained to place concrete.

Third, the area receives hundreds of inches (several meters) of rain each year. "In addition, we were building during the winter, which is considered the rainy season," he says. "Cast-in-place concrete would be very difficult under these conditions because of the amount of rain that would end up being added to the mix."

"To ensure a high-quality, durable, and long-lasting product, we chose precast, because it can be fabricated in a confined and controlled environment," Schilling says.

Concrete Technology Corp., the precaster, is located in Tacoma, Wash. "They fabricated it, and Manson Construction, which was the general contractor, put the precast on a barge and shipped it north to Neah Bay," Schilling says.

The new dock is 120 × 130 ft (37 × 40 m), and the two-lane trestle that runs from the land to the dock is 24 × 380 ft (7.3 × 120 m).



The Neah Bay, Wash., fish dock is vital to the economy of the Makah tribe. Courtesy of T. J. Schilling of BergerABAM.



The precast concrete pile caps used in the new Neah Bay fish dock were barged in from Concrete Technology Corp.'s plant in Tacoma, Wash. Courtesy of T. J. Schilling of BergerABAM.

The completed structure included 116 haunched deck panels, thirty-two 3 × 6 ft (0.9 × 1.8 m) channel beams, 30 dock pile caps, 8 trestle pile caps, and 1 abutment pile cap.

A particularly interesting feature of the structure is that it contains four precast concrete stormwater- and wastewater-retention vaults on the dock and two stormwater-retention vaults on the trestle. The vaults are 5 ft (1.5 m) wide, 20 ft (6 m) long, and 4 ft (1.2 m) deep.

"The water on the surface of the dock flows into these vaults," Schilling says. "Each vault has a cavity, such that the water flows into one side, is treated with filters, and then dumped back into the bay."

The total cost of the project was about \$13.7 million, and it opened in October 2014.

"The tribe is very pleased with the dock and already plans to build an extension," Schilling says. An oil-spill-response team is moored at a nearby marina. However, because this is taking up marina space, the tribe has asked BergerABAM to schemati-

cally design a precast concrete extension to the dock that will provide additional area for the team's mooring.

—William Atkinson

Bridgeport Hospital parking structure meets challenges of expansion

Sometimes the best projects are measured by how quickly and easily they can be completed. That was the case for the Bridgeport Hospital parking structure in Bridgeport, Conn.

"For most owners, you build a parking garage because you have to," says Chris Zarba of Blakeslee Prestress, the precaster for the project. "It is the necessary evil so you can get to the building you want to build."

The 500-space, four-story parking structure was the first phase of a larger project to add a 120,000 ft² (11,000 m²) health-care facility to the 8.8 acre (3.6 ha) site while maintaining use of the five existing buildings. The expansion meant that the facility would need more parking for employees and visitors, even while construction of the new building would eliminate some existing spaces. To alleviate these pressures, designers created a total-precast concrete parking structure that could be erected quickly before construction on the main building began.

"We built the garage first because the new facility was going to consume part of the available parking while requiring more spaces itself," says Dave Carlson, principal at Spiegel Zamecnik & Shah, the structural engineer on the project. "Using a total-precast concrete structure is a natural in our environment in the Northeast. It's cost effective and offers good durability."

It also enabled the project team to work within constrained site conditions. The footprint of the parking structure was extremely tight, limiting access and movement for the crew, Zarba says. The parking structure was centered on a sloping site with foundation retaining walls on the west and north sides, residential property bordering the south side, and wetlands to the east. To make matters worse, there was only one access road for the entire site.

"Constructing a 156,000 ft² (14,500 m²) parking garage on an existing, active medical office building site using a shared access drive for all of the precast delivery trucks, equipment, and crane was one of the biggest challenges on this project," he says.

To ensure that construction went as smoothly as possible, the design team brought Blakeslee in at the beginning of the project as a design assist to leverage their expertise on the most efficient methods, sizes, and finishes to maximize efficiency throughout the project. Both teams used building information modeling to produce three-



Blakeslee Prestress Inc., the precaster for the new Bridgeport Hospital parking structure in Connecticut, used three-dimensional models to help overcome site challenges. Courtesy of Blakeslee Prestress Inc.



The aesthetics of the Bridgeport Hospital parking structure in Connecticut demonstrate that precast concrete can be both useful and attractive. Courtesy of Blakeslee Prestress Inc.

dimensional (3-D) models of the project, then compared their models to hone the final design. That allowed them to identify any issues and resolve at the shop-drawing stage rather than on the construction site and reduced the time needed to get submittals prepared.

The 3-D modeling also helped the design team make quick changes late in the design phase when the owner decided to reduce the height of the structure in one section.

"It looks great, and everyone is happy with the results."
—Chris Zarba, Blakeslee Prestress

"We made a revision to the design, and we were still able to maintain our schedule," Zarba says. The erection was completed in eight weeks as scheduled, with no problems on-site. "It looks great, and everyone is happy with the results."

—Sarah Fister Gale