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SPRING 2021  
ABOVE-GROUND  
ISSUE

## Precast Rises to the Top in Fort Lauderdale



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3	MILLS, SWYER	UCSB	32.17	171144	2
4	GEORGE, HESS	UCSB	32.36	166052	1
5	SARLEY, WHELEY	WCO	32.32	174101	5
6	JACKSON, EAST	OR	31.23	171355	3
7	SWANSON, HESS	VOK	31.06	174545	4
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FEDERAL SWIMMING HALL OF FAME





# Dual-Purpose Pro Brings Life to Bric





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**Precast concrete allowed a Virginia construction company to lay a solid foundation while building a foot-and-bike bridge over a park pond.**

By Joe Frolo

Photos Courtesy of Smith-Midland

**T**here's a common thread throughout the precast concrete community. People in the industry love their jobs and are proud of the structures they create. They drive past buildings and down highways, seeing precast concrete seemingly everywhere, knowing they helped bring it all to life.

That can be a hard concept for children to understand. Kids can be tactical rather than conceptual and learn by touching things, feeling them with their own hands and feet.





For Alex Burkhardt, projects manager at Virginia-based Smith-Midland, a recent venture offered both a challenge and a personal reward. A new foot-and-bike bridge at Ben Brenman Park in Alexandria, Va., combines not just form and function, it serves as the centerpiece to an enjoyable afternoon for the entire family, including Burkhardt's.

"It was a fun project," he said. "Most projects I've done are along a roadway, but with this one, I could take my kids and have them walk along what went up. It's a little different than our typical experience with construction jobs."

## STARTING FROM THE BOTTOM UP

Smith-Midland supplied the precast concrete footers, posts, panels and hammerhead piers for the bridge that sits above two weirs designed to facilitate water runoff.

Work began with Avon Construction dredging the affected portion of the 290-acre pond and relocating the wildlife in and

around the water to other locations. With all the runoff during decades of weather, animal and human interaction, a lot of debris had settled at the bottom of the basin.

A \$1.75 million grant from the Virginia Department of Environmental Quality, which required finding new homes for all the fish and other wildlife, funded the project.

"We hired a biologist to remove all the turtles and fish, even frogs," said Kurt D. Lorenz vice president of Avon Construction. "Then they restocked everything afterward. This is a pond that kids frequent, so we were pleased to see all that happen."

Once Avon drained the affected portion of the pond, they began setting the foundation. With the surface areas being so wet, the contractor determined that it was more cost- and time-effective to use precast concrete to construct the base and the weir wall.

Avon dug an open area to put the base and precast footings down, then locked everything together with panels and piers.



## SOME MAJOR WET WORK

The weirways allow water to spill safely away between the pond's three cells and prevent flooding. They serve as dams designed specifically to impound water behind a wall while the weir alters and directs the flow.

In essence, Smith-Midland and Avon diverted 35 acres of water to build two concrete weir walls that control the pond's water level, one of which has a bridge on top of it.

The biggest complications, both Burkhart and Lorenz said, was keeping everything dry during the project and maintaining watertight seals after the job was done.

"It was a little unique," Burkhart said. "I hadn't been part of anything like this before. All of the work would eventually be underwater. We've made walls before but never for that purpose."

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Smith-Midland manufactured precast concrete footers, posts, panels and hammerhead piers for a foot-and-bike bridge. With much of the project being underwater, special consideration was given to ensuring watertight joints and connections.

Even after dredging and partially draining the pond, Avon still had to contend with a lot of swampy, wet conditions. To solve that, crews laid large inflatable bladders that served as temporary portable dams that spanned the entire distance of the pond.

"At one point, I got to walk across the inflatable dam," Burkhart said. "It was like walking across a waterbed. You needed a cable to hold on to as you did it or else down you went. The bladders were 20 feet wide and 100 feet long. Several of those stacked on top of each other to make the dam."

## EVERYTHING REMAINS WATERTIGHT

Precast footings sit spaced out at the bottom of the pond with columns attached to them. Wall panels then slide down into the footings. One weir was just that, Burkhart said – footings, columns and the weir wall. The other weir, with the bridge on





Using precast concrete products was more cost- and time-effective to construct the base for the bridge thanks to its ease of installation.

top of it, required hammerheads on top of the columns and abutments, serving the spans within the bridge.

Because much of the precast concrete would spend its time underwater, the architect and Smith-Midland created watertight joints and connections.

“The connections had to be pretty precise and, at the same time, give us the strength required,” Lorenz said. “What they came up with was a bolted, grouted connection. That was a pretty unique part of the job.

“The other thing they came up with that was different and job-specific had to do with the weir wall. The joints used above ground in similar jobs are not typically watertight, so we used a water stop that applied to the panels to stop the water from leaking through.”

Even with all of the precautions and preplanning, Avon Construction’s biggest challenge remained being at Mother Nature’s mercy. After four months from contract to casting, it took an additional two months to put it together. Heavy rain led to runoff refilling parts of the pond, and additional time was needed to pump the site dry.

“They got down there with the sump pumps and buckets getting everything out that would spill into there, including fish, frogs and turtles,” Burkhart said. “It was more than I expected, but Avon has done this kind of thing before, so they were prepared.”

## A DESIGN TO BE PROUD OF

The final pieces of precast to be installed were the hammerheads, designed to match the look, feel and style seen throughout Alexandria.

“The city liked the architectural features you get with precast,” Lorenz said. “You’ve seen these traffic overpasses with hammerhead tops to them, spanning





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out in a big triangular shaped piece. They used the same thing on the bridge, and it looks very nice. We even put it up for some awards.”

The project was a decade in the planning for the city of Alexandria, and officials are happy.

“They got a lot of great feedback from the community,” Lorenz said. “They’d been wanting his bridge for 10 years, and they could not be more pleased with the outcome.

“Smith-Midland is tops in the industry. They did a great job. Their engineers and project management were very clear and in constant contact with me.”

City leaders got their bridge, and Burkhart’s then 3-year-old son finally got a first-hand look at what daddy does for a living.

As a second-generation precaster, Burkhart hopes one day to watch his children follow in his footsteps, taking the same pride in the ways precast concrete helps build the world around us.

Truth be told, though, Burkhart admitted that his son Ridge probably would have been happier right now with one of the turtles. **PS**

*Joe Frollo is NPCA's Acting Director of Communications and Public Affairs and editor of Precast Inc. magazine.*

# Precast Concrete Gets Modular

Modular construction with precast products offers reduced installation times and enhanced aesthetic appeal.

By Mason Nichols

Whether you're a child stacking Legos to build an impenetrable fortress or a homeowner crafting a fire pit in the backyard, there's something satisfying about creating a finished structure using individual components.

Beyond the fun, modular building continues to take the construction industry by storm. From healthcare to industrial buildings to multi-family homes and beyond, modular construction methods can benefit nearly any project.

But the true power of the approach is unlocked by selecting the right building material for the job.

Precast concrete products aren't just durable and resilient. Precast components are quick to install, meeting and exceeding the needs of project owners. These attributes make precast a popular choice for modular building.

## STANDING STRONG IN SOUTH DAKOTA

Wind is a powerful natural resource that can be harnessed to generate clean energy. Such is the case in eastern South Dakota, where the 14,000-acre Tatanka Wind Farm – the largest renewable-energy project in North and South Dakota – produces enough energy to power more than 60,000 homes.<sup>1</sup>

Excessive wind can be a devastating force, impacting homes and businesses alike. With tornadoes a regular seasonal threat at

the Tatanka Wind Farm, owners needed an on-site storm shelter with the ability to protect their team members during extreme weather events. The answer was precast concrete.

Minnesota-based Crest Precast Concrete partnered with local general contractor Huff Construction on the job. According to Brett Andrews, project manager for Huff Construction, the storm shelter was constructed for the wind farm's operations and maintenance building.

"They were originally going to go with an interior design, but to maximize space inside their building, they shifted gears and went with a separate building for the precast concrete storm shelter," he said. "This is a 3-acre site, so they decided to use some of their lay-down area for the shelter."

Throughout the design phase, Crest Precast and Huff Construction collaborated closely to ensure the 20-person storm shelter was compliant with appropriate codes. Initially, the shelter was designed to adhere to the International Code Council's ICC 500 standard. After client review, the team determined that the Federal Emergency Management Agency's P-361 standard was more appropriate. With the new, more stringent standard in place and all partners on the same page, Crest Precast got to work manufacturing the shelter.





Photo courtesy of Crest Precast Inc.

Kevin Thicke, drafting manager with Crest Precast, said the 48,000-pound shelter, which provides each person 5 square feet of space at max occupancy, is 16-feet tall by 8-feet, 6-inches wide. The shelter also boasts 56 weld plates between the floor, walls and roof.

“This storm shelter is a six-sided structure,” Thicke said. “We pour the individual panels, erect it in our yard and then ship it to the client in one piece.”

Because the shelter was preassembled at Crest Precast’s plant, installation time at Tatanka Wind Farm was reduced considerably. As Andrews said, the process was just about as simple as it could get.

“The only thing we had to provide Crest was a foundation for the structure to sit on,” Andrews said. “Beyond that, the shelter showed up on a lowboy, and we had a crane lined up. We picked it up with slings, put it in place and anchored it down.”

Installation was completed in just one day. Choosing precast gave the owners several advantages, including enhanced structural integrity, ease of assembly and heightened aesthetics. Andrews noted that because of the weight of the structure, less anchorage was required than if the shelter had been built with a competitive material, such as metal. Steve Mader, president of Crest Precast, also emphasized the shelter’s resilience.



Photo courtesy of Crest Precast Inc.

A precast concrete storm shelter provides security and safety for the Tatanka Wind Farm.

“We trust our engineering completely,” he said. “When the engineer says to us, ‘This shelter will not slide, tip or flip in a major weather event with 250 mph winds,’ we’re confident if that day comes, there will be no issues.”



Using a modular precast concrete building gave an Illinois park a quick and easy solution for its restrooms and storage unit.

## SIMPLE SOLUTION IN SWANSEA

Modular construction opens a world of possibilities for other structures as well, including utility buildings, classrooms and more. At the Boul Avenue Trailhead Park in Swansea, Ill., a modular precast solution was the material of choice for a combined restroom and storage unit. To manufacture the building, McCann Concrete Products of Illinois partnered with Easi-Set Worldwide, a Midland, Va.-based company, that licenses a variety of precast building designs to precast manufacturers throughout the industry.

The need for the combined structure was spurred by Swansea's new bike trail, installed to provide additional transportation options for commuters and a safer means for students at the local High Mount School to access nearby sporting fields and subdivisions. McCann Concrete and Easi-Set met frequently to discuss the design as they identified the best possible approach.

"This particular building required a custom layout, which led us to some design and construction situations that we had not encountered before," said Matt McCann, vice president

at McCann Concrete. "But the Easi-Set team was able to pull knowledge and experience from a vast array of projects they've worked on around the U.S. and locally to help us find solutions that we may not have been able to find on our own."

The team ultimately decided on a two-piece modular solution with a men's and women's restroom on one side and a storage unit with roll-up door on the other. The combined structure measures 16 feet high by 28 feet wide and weighs approximately 100,000 pounds.

According to Jeremy Smith, building products manager for Easi-Set, the process for installing the two modules on-site was straightforward thanks to the work accomplished ahead of time.

"Besides having the pad ready and stub-ups for the plumbing, essentially the building was ready to go once it arrived at the project site," he said. "The water and sewer could be hooked up and ready to use on the same day as installation."

The Easi-Set building does not require a separate footing for installation, as the post-tensioned floor slab functions in that role. McCann referenced this as a major advantage for precast



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concrete, noting that his crew was on-site for less than two days to fully install the building. He added that his team completes other operations prior to installation, also helping to accelerate the process.

“We don’t just cast the panels at our production facility – we assemble, apply coatings and install the fixtures,” McCann said. “We will even have electrical and plumbing inspections at our plant ahead of time to ensure that the building will be to code before it arrives on the job site.”

The structure in Swansea also features a split-face block design, giving it an attractive appearance that would not be attainable with other products.

## **SIMPLE, FLEXIBLE, POWERFUL**

As modular construction methods continue to gain popularity in the industry, more architects, engineers, contractors and project owners are turning to precast concrete solutions. With myriad advantages, including durability, resilience and ease of installation



– along with the flexibility that enables it to be a part of nearly any imaginable project – precast is the ideal building material for embracing the modular approach. **PS**

*Mason Nichols is a Grand Rapids, Mich.-based writer and editor who has covered the precast concrete industry since 2013.*

### **Endnotes**

<sup>1</sup> <https://www.accionacom/projects/tatanka-wind-farm/>