Bridge to the Future

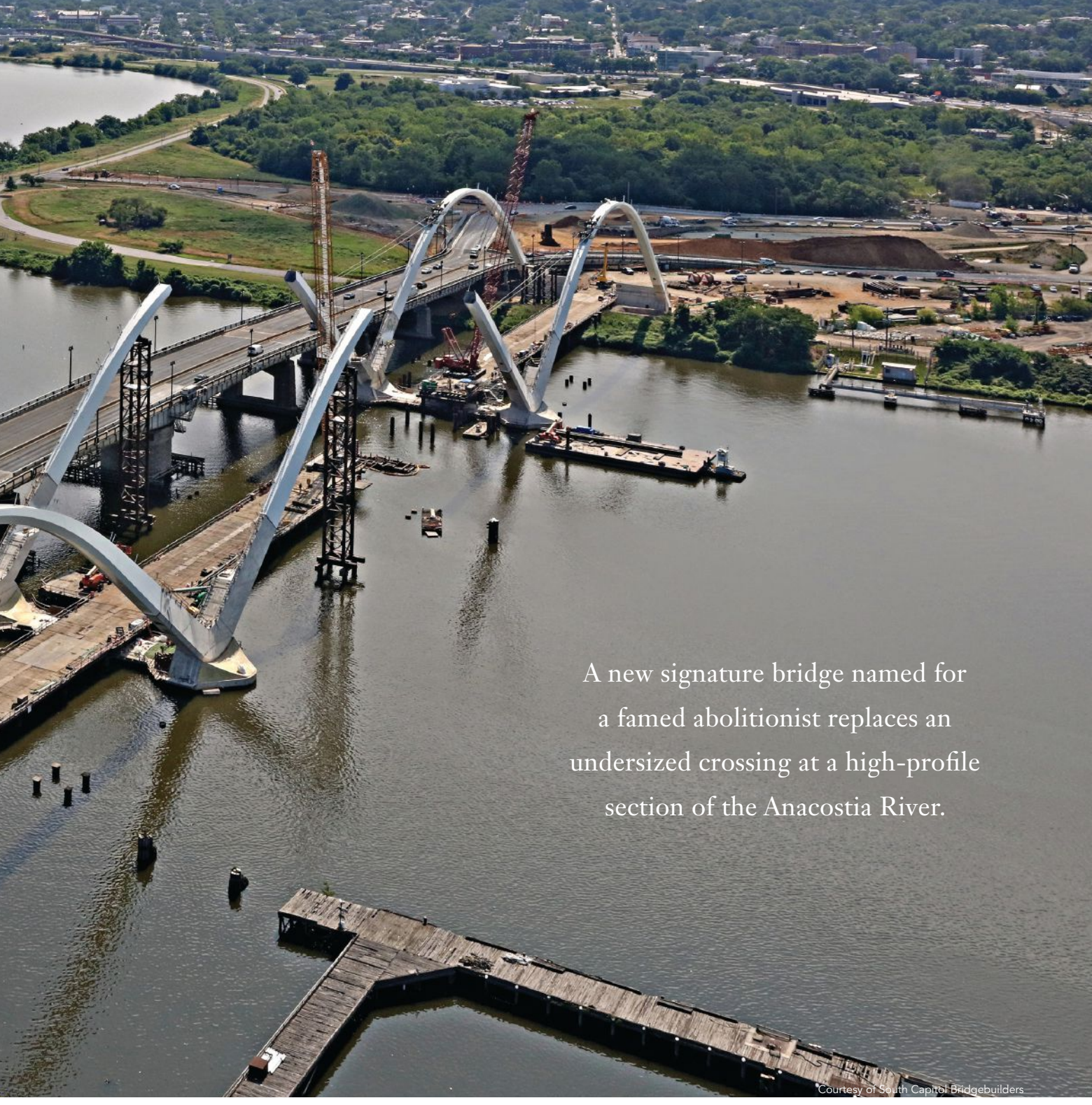
BY KEVIN BIRD

WASHINGTON, D.C.'S new Frederick Douglass Memorial Bridge connects not only the two sides of the Anacostia River but also the region's past with its future.

Named for one of the area's most esteemed abolitionists and residents, the $480 million three-span bridge opened this past fall and stretches 1,445 ft over the river between D.C.'s Anacostia neighborhood and Navy Yard district, with the approaches landing just a stone's (or baseball's) throw from Nationals Park. Built to accommodate traffic over the river, it carries six traffic lanes flanked by 18-ft-wide paths on both sides for pedestrians and cyclists.

At the bridge's dedication, Kenneth B. Morris, Jr., the great-great-great-grandson of Frederick Douglass, stated, "We are thrilled that this magnificent bridge will serve to educate the public about [Douglass'] legacy, connect D.C. to the neighborhoods where he worked and lived, and inspire future generations to agitate for change," according to *Washingtonian* magazine.

The new steel crossing replaces its predecessor, which was built in 1950 and named the South Capitol Street Bridge and was recently demolished. It was renamed the Frederick Douglass Memorial Bridge in 1965 and underwent some renovations at that time, but even then, it remained a traffic headache and only offered 5 ft of cramped concrete for pedestrians and cyclists to cross the river. Over the years, it also began to deteriorate, with its old, narrow walkways losing large chunks of concrete. And with more than



A new signature bridge named for a famed abolitionist replaces an undersized crossing at a high-profile section of the Anacostia River.

Courtesy of South Capitol Bridgebuilders

77,000 commuters driving across the bridge each day, it experienced the inevitable wear and tear. It became clear that a larger, more accommodating, and safer bridge was needed.

Also, a more attractive one. In addition to helping relieve the area's traffic burden, the new bridge also offers pedestrian overlooks and is defined by six steel arches, three on each side. These signature elements echo the vision of Pierre L'Enfant, the French-American military engineer who designed the basic layout for the nation's capital and visualized the South Capitol Street Corridor as a resplendent boulevard leading into the heart of the district. The arches are comprised of 56 arch rib sections that were shipped via truck to the site from two of fabricator Veritas Steel's locations, one in Eau Claire, Wis., and the other in Palatka, Fla. The arch ribs are hexagonal in shape, fabricated from flat plate steel, and vary in depth and width from the base to the top arch section. Veritas fabricated more than 7,100 tons of steel for the bridge in all, including the arches and superstructure elements, and the bridge also incorporates 12,000 linear ft of steel piles. Each center arch is made up of 12 sections, and each end arch is made up of eight sections, with all sections varying in length from 28 ft to 65 ft and weight from 20 tons to 75 tons.

Planning for the bridge took over a decade before construction started in the summer of 2017. The project employed approximately 200 local residents, and at least 45 minority- and

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above: A temporary bridge was built for the cranes to work from and was progressively removed as the arch floor system was being erected.

left: Looking up at the superstructure beams.

women-owned businesses contributed to the bridge's erection, amounting to $91 million in contracting jobs.

Steel was chosen as the structural material thanks to its lower maintenance requirements and the fact that it offered a 100-year-plus lifespan. The steel superstructure is supported by a system of cable-stay hangers, which was chosen because it was lighter and more cost-effective than a concrete superstructure would have been, and also provided superior fatigue resistance, corrosion protection, and ease of replacement. There are 14 hangers for each side arch and 16 hangers for the two center arches (88 in all). There are 18 to 29 strands per hanger, each 0.62 in. in diameter. The design incorporated a repetitive steel grid sequence, using longitudinal edge girders and transverse floor beams, coupled with

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precast concrete deck panels, which made for relatively simple erection. A temporary bridge was built for the cranes to work from and was progressively removed as the arch floor system was being erected.

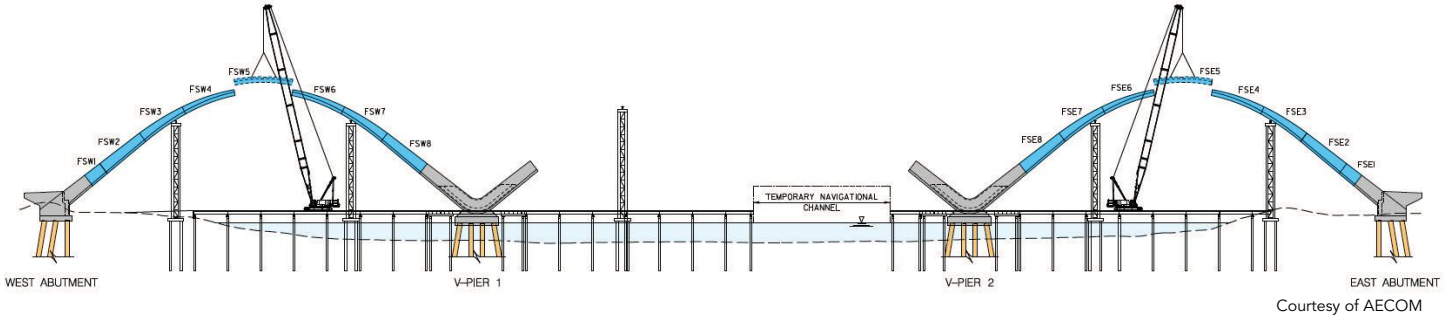
In addition to the new bridge, other project elements include a new traffic oval that connects South Capitol Street, Suitland Parkway, and Howard Road SE. This new scenic boulevard will showcase landscaping on both sides. By later this spring, the new traffic ovals should be completed, and there will also be space for community activities on either side.

The bridge opened to the public on September 10th with a community celebration that included a 5K race attended by around 4,000 people, a walk led by Washington Mayor Muriel E. Bowser, and a ribbon-cutting ceremony. Descendants of the abolitionist Frederick Douglass, the bridge's namesake, spoke at the event, as did Congresswoman Eleanor Holmes Norton and Majority Leader Steny Hoyer.

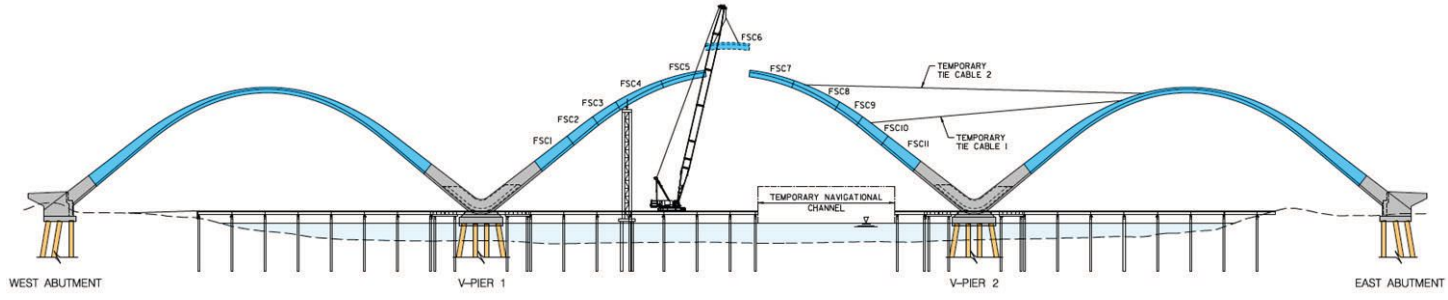
A symbol of Washington's past and future, the 100-plus-year bridge is just one of several projects under the Anacostia Waterfront Initiative Program, whose goal is to revamp the river into a thriving waterfront that can enrich its surrounding communities for generations to come. And with this significant piece of

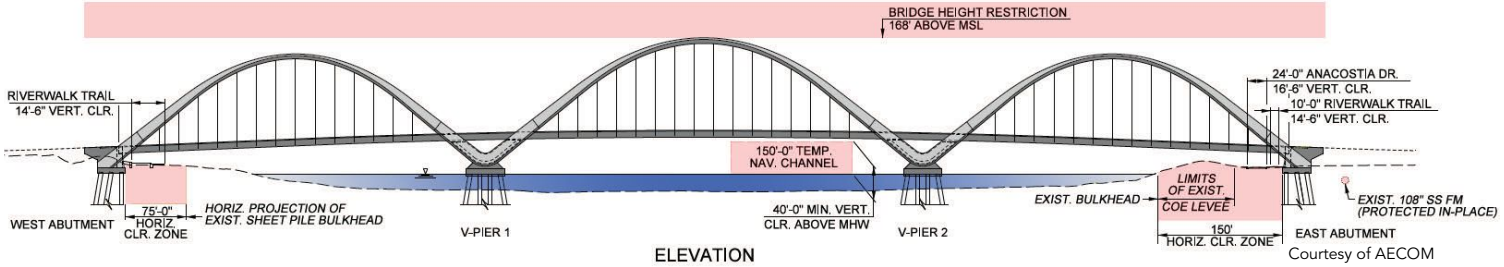
above and below: The arch ribs are hexagonal in shape, are fabricated from flat plate steel, and vary in depth and width from the base to the top arch section.

below: The erection sequence for the arches.



Courtesy of AECOM



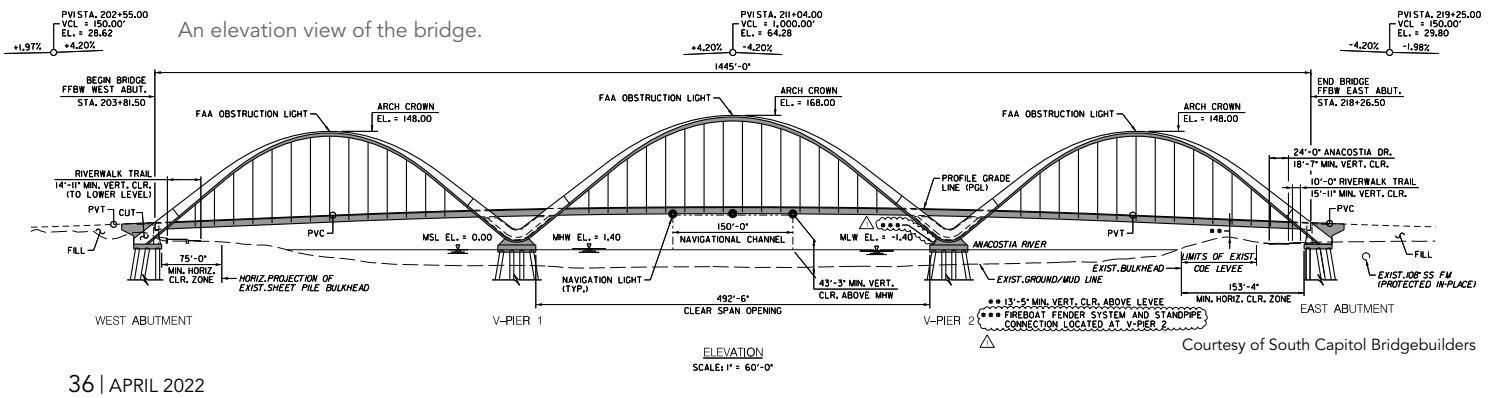


Courtesy of AECOM

Clearance requirements for the bridge.

Shoring assemblies for the arches.

Courtesy of AECOM



An elevation view of the bridge.

Courtesy of South Capitol Bridgebuilders

The bridge spans the Anacostia River between D.C.'s Anacostia neighborhood and the Navy Yard district, with the approaches landing near Nationals Park on the Navy Yard side.

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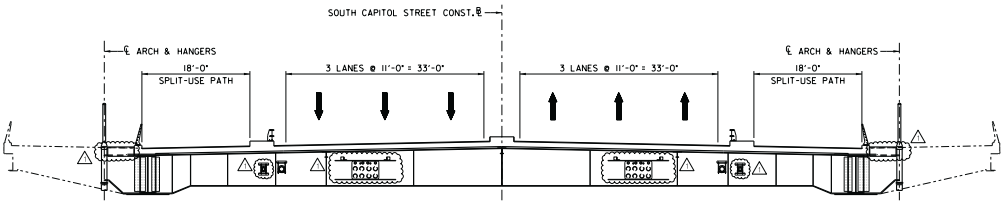
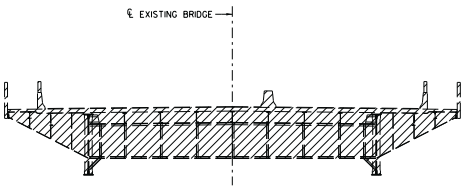


PROPOSED BRIDGE

Courtesy of South Capitol Bridgebuilders

The new bridge's width as compared to that of the existing bridge.



EXISTING BRIDGE

Courtesy of South Capitol Bridgebuilders

Placing floor beams following completion of arch erection.

the puzzle now in place, the initiative is off to a great start. ■

Owner
District of Columbia Department of Transportation

Construction Manager
HNTB

General Contractor
South Capitol Bridgebuilders (a joint venture of Walsh Construction and Granite Construction Co.)

Architect
BeAM

Structural Engineer
AECOM

Erection Engineer
McNary Bergeron

Steel Team

Fabricator
Veritas Steel, LLC
Eau Claire, Wis., and Palatka, Fla.

Detailer
Tensor Engineering Co.
Indian Harbour Beach, Fla.

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