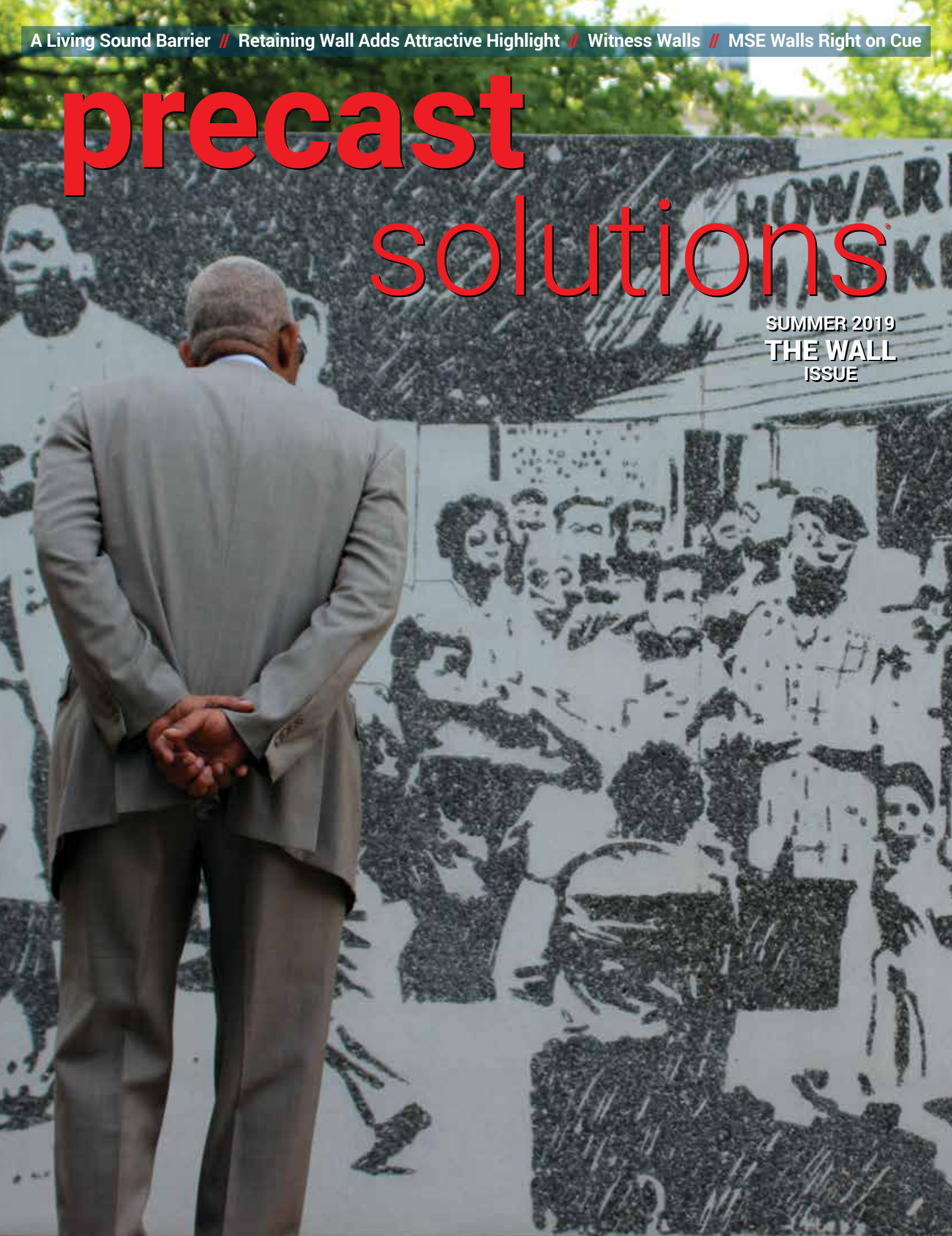


A Living Sound Barrier // Retaining Wall Adds Attractive Highlight // Witness Walls // MSE Walls Right on Cue

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SUMMER 2019
THE WALL
ISSUE



ON THE COVER:
Civil Rights activist Ernest "Rip" Patton takes a moment
to observe the Nashville *Witness Walls*. The precast
concrete panels feature photos and collages from historic
moments during the Nashville Civil Rights Movement.

Photo courtesy of Metro Nashville Arts Commission

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A Bridge Over Troubled Road

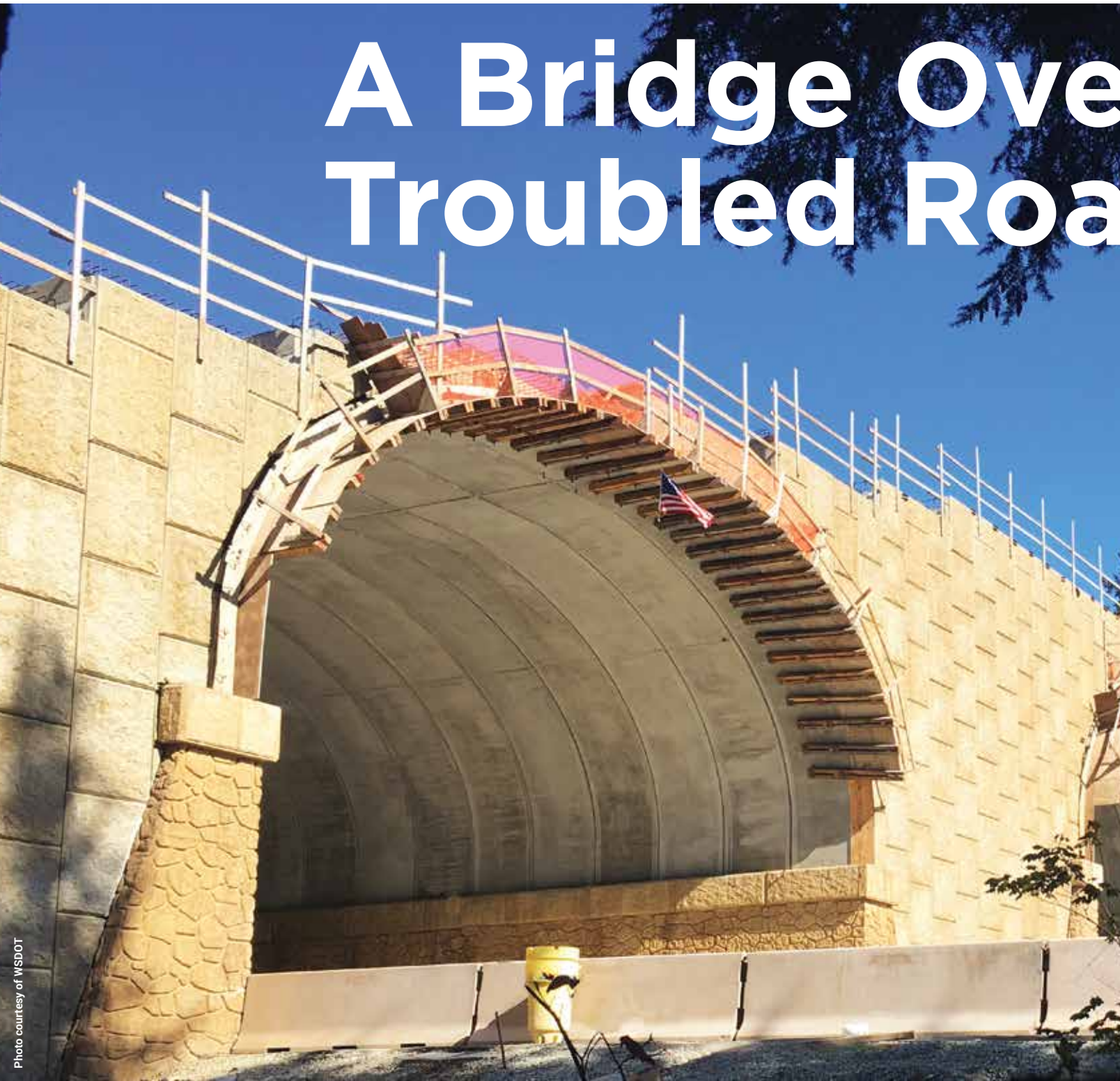


Photo courtesy of WSDOT

A precast concrete wildlife overcrossing, the first of its kind in Washington state, increases wildlife safety and reduces danger to motorists.

By Kirk Stelsel, CAE



A precast concrete arch system and MSE walls create a safe passage for wildlife in Washington state.

Why did the chicken cross the road? It's a quintessential joke everyone has heard. But with more than 270 million registered vehicles driving on 4.18 million miles of roadway in the U.S., the reality of animals safely crossing our roads is no laughing matter.

According to the Federal Highway Administration, there are an estimated one to two million collisions between cars and large animals every year in the United States. In an independent study, State Farm estimates the average deer collision costs drivers \$4,341.

Although animal collisions are rarely top-of-mind for the average driver, proactive measures reduce the significant toll such incidents have on our wallets, our economy and our ecosystem.

WHERE THE DEER AND THE ANTELOPE PLAY

Within its boundaries, Washington state hosts six national forests and 215 state parks. The expanse of its wilderness is an asset, but it also poses unique challenges, like keeping animals and motorists safe where they frequently meet.

One such roadway, Interstate 90, cuts through the heart of Washington, traversing through national parks and the Cascade mountain range as it connects the eastern and western portions of the state. Motorists who travel the route enjoy breathtaking views and can catch glimpses of various wildlife. The trouble, however, is when those wildlife sightings turn dangerous.

The interstate not only divides elk populations, it has created a barrier for the species as it migrates between food and water sources. In addition, moose and bears frequently cross I-90 during their natural movements.

Previous safety measures included wildlife underpasses, but in 2018 a new approach to safety debuted on I-90 at the summit of Snoqualmie Pass. With experts concerned about animals limiting their use of underpasses due to their confining nature and threat of predators, the state built a wildlife overpass to encourage wildlife to safely cross the road.

The structure is part of a large-scale, 15-mile improvement project between Hyak and Easton that includes new lanes, bridges and stabilization of rock slopes to reduce avalanche closures and improve wildlife movement.

"Eventually we'd like to extend it further, but this section had major backups during holiday weekends," said Brian White, assistant regional administrator for construction for Washington State DOT. "It's a major freight corridor and on the weekends a major recreational corridor. This was the most challenging section."

IGNORANCE IS BLISS

The key to a successful manmade wildlife crossing is ensuring the animals see the path as their natural habitat. WSDOT went to great lengths to create this type of environment. To start, the general contractor installed a precast concrete Contech BEBO bridge concrete arch system manufactured by H2 Precast in East Wenatchee, Wash. It was covered with 115,000 cubic yards of dirt and native vegetation. This reduces stress on the animals and creates a habitable space for ground-based animals.



Photo courtesy of H2 Precast

Wildlife are able to migrate naturally over Interstate 90 without posing a threat to motorists.

The overcrossing features two precast wall systems. The path is flanked by 589 MSE wall panels covering 16,053 square feet. The panels were manufactured by Wilbert Precast, headquartered in Spokane, Wash., using the Reinforced Earth Company's licensed product. Wilbert also manufactured wall panels for either side of the crossing to block the animals' view of the road below, prevent headlights from disturbing the animals and mitigate sound.

The design of the panels – which were originally designed to be shotcrete but changed by the DOT due to the convenience of precast – includes exposed rebar ties for moment slab pour back at the top of the arch. The 159 panels total 8,373 square feet of surface area and on average are 4 feet 5 inches wide, 13 feet high and 10 inches thick.

“The screenwall panels were nearly all custom including daily liner cuts and changes, reveal molding modifications, panel width changes and custom bulkheads to accommodate the angles of the arch,” said Brandy Rinkel, assistant chief of operations for Wilbert Precast and branch manager of its plant in Yakima, Wash.

According to Todd Freeman, an engineer

with Guy F. Atkinson Construction, the use of precast reduced costs and allowed for a more efficient construction sequence. He said it also played a large role in the project finishing on time and with a high degree of quality. WSDOT appreciated how the use of precast mitigated major traffic issues.

“We didn't have to have a bunch of forms on the site,” White said. “We made a commitment to keep two lanes of traffic going in each direction during peak travel times. You have the rock face on one side and a lake on the other, and the precast wall panels gave us a lot of flexibility to build those walls under traffic loading and keep traffic moving.

“They show up, you put them in place and you move on.”

A BENEFIT TO WILDLIFE AND MOTORISTS ALIKE

More than 28,000 vehicles traverse I-90 daily, so accidents create major backups that cost the state and motorists in terms of damages, lost time, emergency response, delay in the movement of goods and reduced air quality from idling vehicles. The overpass helps reduce these costs.

Making sure not to forget the view for the motorists traveling under the overcrossing, Wilbert and Atkinson finished the MSE and screenwall panels with a granite block and Cascadia stone look native to the area.

While the overcrossing is the first in the state, it won't be the last. WSDOT is building a similar structure at the end of the corridor. As the first, the current structure serves as a model for not just additional crossings in the state, but likely for similar projects around the country. In addition, the solution not only works for wildlife in remote or mountainous areas, but also for any type of movement of people or animals across a roadway.

A WORTHWHILE CHALLENGE

Freeman said the project was not without challenges, but the team was able to come up with solutions. The biggest takeaway from such a unique precast project was the solid

relationship between the contractor and precast manufacturers. He said that relationship between all the parties resulted in a higher quality product, ensured delivery of critical elements on time and led to a successful project.

"It was a tough, time consuming and detailed project, but the final product is beautiful," Rinkel said.

The state is monitoring the use of the overcrossing via remote cameras. Additionally, wildlife monitoring on the habitat adjacent to the highway will help to inform natural resource management and conservation efforts while providing insight into what species may use the overcrossing in the future.

Now, no matter the reason why wildlife in the area want to cross the road, the overcrossing ensures they can do so safely, away from motorists who can simply enjoy the view. **PS**

Kirk Stessel, CAE, is NPCA's director of communication.

An overpass was chosen since tunnels can be intimidating for animals. Native vegetation was added as well.



Photo courtesy of Wilbert Precast

Photo courtesy of Comm Ave Bridge



Specifier Q&A

This issue, Precast Solutions hears from Mike McGrath, the assistant administrator of construction engineering at the Massachusetts Department of Transportation.

The Commonwealth Avenue Bridge project used several precast concrete pieces to help expedite the construction project.

All photos courtesy of MassDOT

What is your role at MassDOT and what do you specialize in?

I oversee all aspects of transportation construction projects throughout the commonwealth, including construction management, environmental compliance, design/build, oversight of MassDOT's Central Research & Materials Lab, and construction contract procurement. MassDOT has a very robust construction program which on an annual basis spends approximately \$1.2 billion.

What will MassDOT be focusing on in 2019?

MassDOT is continuing to focus on improving our existing road and bridge infrastructure and ensuring that people throughout Massachusetts can reliably and effectively reach the places they need to go. The department is also continuing to focus on ensuring travelers are able to utilize their preferred mode of transportation to reach their destination, such as driving, riding a bicycle, walking, utilizing public transit or another form of transportation. Major projects that MassDOT will be focusing on in 2019 include the North Washington Street Bridge Replacement Project, the Chelsea/Route 1 Viaduct Improvement Project, as well as many other construction projects throughout the Commonwealth.



Mike McGrath

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What precast concrete products were used for the Commonwealth Avenue Bridge Reconstruction project and why was precast chosen?

MassDOT utilized precast concrete deck panels in order to maximize efficiency and reduce the construction duration. This was a complex project in the heart of Boston, and MassDOT chose precast concrete deck panels so that work operations could be completed as quickly as possible with minimal impact on the traveling public and local community. The project was broken up into two construction seasons to replace the east and west sections of the structure originally constructed over 50 years ago.

What are some other unique or interesting projects on which MassDOT specified the use of precast concrete?

MassDOT has used precast concrete on a number of large construction projects. They were used extensively in MassDOT's Accelerated Bridge Program. Additionally, MassDOT's nationally recognized Interstate 93 Fast 14 project used prefabricated bridge units during the replacement of 14 bridges over 12 weekends in

2011. The use of precast allowed the contractor to replace each bridge deck within a 55-hour window.

Precast deck panels were also used on the Whittier Bridge replacement project, which was a \$312 million bridge replacement of Interstate 95 over the Merrimack River in Amesbury/Newburyport north of Boston.

Why was precast used? Certain benefits?

Precast concrete has reduced construction timelines and impacts to the traveling public. It has also improved the overall quality of the end product as precast units are produced in a controlled environment.

What type of projects do you anticipate using it on in the future? Anything different or new?

MassDOT has benefited from the lessons learned under the ABP program and has incorporated precast elements into most bridge projects. MassDOT has found the overall reductions of construction timelines and reduced impacts to the traveling public to be very beneficial. **PS**

A Living Sound B



Photo courtesy of Collins Engineers



ARRIER

Precast concrete and living plants come together to create the perfect sound barrier for a park in Chicago.

By Matt Werner

The popularity of urban trails has increased exponentially in recent years as communities use them to connect neighborhoods, mitigate traffic congestion and encourage exercise. The trails also create green space, which can be hard to come by in congested cities like New York or Chicago.

The 606 in Chicago, a \$95 million urban trail project that took a decade to plan and build, opened to the public in 2015. The city repurposed an elevated freight train line to create a 2.7-mile path that connects six ground-level parks and areas that were cut off by the abandoned rail line while adding much-needed green space to several neighborhoods on the city's northwest side.

At the eastern end of the trail sits Walsh Park, a major entryway for the trail that is nestled right next to Interstate 90/94. The trail comes to a head in the park, with a six-lane highway on one side, two sides buffered by residential housing, and the fourth side opening to an outdoor amphitheater.

To keep the highway noise out of the park and ensure concerts don't disturb the 80,000 nearby residents, a sound barrier was needed. But given the significance of the project, no ordinary barrier would do.

With the city and neighbors of the project wanting something that would be both aesthetically pleasing and an effective sound barrier, a precast concrete Evergreen Wall provided a solution for not only the city, but the surrounding area.

Photo courtesy of Wieser Concrete Products Inc.



Photo courtesy of Wieser Concrete Products Inc.



Photo courtesy of Wieser Concrete Products Inc.



Wieser Concrete Products produced more than 100 pieces for the project, with all the pieces being custom due to the radius of the project.

A GREEN SOLUTION

When designing the renovation to the park, landscaping was identified as a way to provide an aesthetically pleasing backdrop to the outdoor plaza. The landscaping needed to be mature enough and tall enough to effectively block noise coming from the park as well as provide a buffer from the nearby expressway.

Enter a precast concrete Evergreen Macro Wall for the project, checking off all the boxes the design team and city officials wanted.

“The wall’s aesthetics, once planted and matured, was a big draw as well as the wall’s ability to absorb sound and resist and hide graffiti,” said James Hamelka, the project manager for Collins Engineers. “A barrier and retaining wall were needed at the end of the trail to bring the elevated trail down to grade, but neither the design team, nor our clients, were satisfied with a typical wall or barrier.”

Collins was responsible for the project management and engineering, while Michael Van Valkenburg and Artetal were responsible for the aesthetics. Hamelka noted several other benefits in using precast concrete.

“Precast was chosen because of the anticipated low maintenance that a precast product would offer,” he explained. “Precast concrete is a unique material that allows for creative forms and shapes while still providing structural capacity, durability and design properties that we are used to working with as engineers.”

ON TIME DELIVERY

Wieser Concrete Products, based in Maiden Rock, Wis., was selected for the project. Its plant in Portage, Wis., produced more than 100 pieces for the project. Pieces were 16 feet wide and 2.5 feet high and used a 5,000 psi concrete mix. Vice President Mark Wieser noted that extensive planning made the project easier and mitigated production issues.

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Photo courtesy of Wieser Concrete Products Inc.



Photo courtesy of Wieser Concrete Products Inc.

Taking place in Chicago, the job site was incredibly tight with an elevated interstate and residential housing on three sides of the project.

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“Pretty much every piece had to be custom,” said Wieser. “It was being set on a radius around the trail and park there, so the ends were tapered. As you came up the wall, the tapers all changed.”

With mere feet of clearance between the project site and the surrounding neighborhood and highway, the job site came with its own set of constraints. Hamelka credited all the skilled professionals who “worked their magic” to overcome the incredibly tight job site.

“It came down to a matter of delivering, especially with several different pieces,” Wieser noted. “We had to deliver it as they needed to set it. That way they could set it right off of our trucks and into place where they needed to go.”

PLANT-ABLE PRECAST

Once all the elements were stacked in place, the interior cavity was filled with a local material and compacted. Then, the exterior trays were filled with topsoil and plants added to give the wall the “evergreen” look all sides were hoping to attain.

“(Using the Evergreen Wall) provided an opportunity to extend the landscape design of the trail onto the vertical wall surfaces and provide additional green space in the heart of an urban environment,” Hamelka explained. “Our client team was great to work with and was open to outside-the-box thinking throughout the project; if it wasn’t for them, none of this would have been possible.”

Now, instead of graffiti-stained walls and constant highway noise from the six-lane elevated expressway, the park has a living, breathing wall made from precast concrete. Hamelka, who used to live near the project area, said it’s been exciting to see the project come to fruition both professionally and personally.

“I was at the trail last summer, and the wall looked great,” he said. “As the plant life continues to mature, I imagine it will only look better with time.” PS

Matt Werner is the managing editor of Precast Solutions magazine and is NPCA's communication manager.

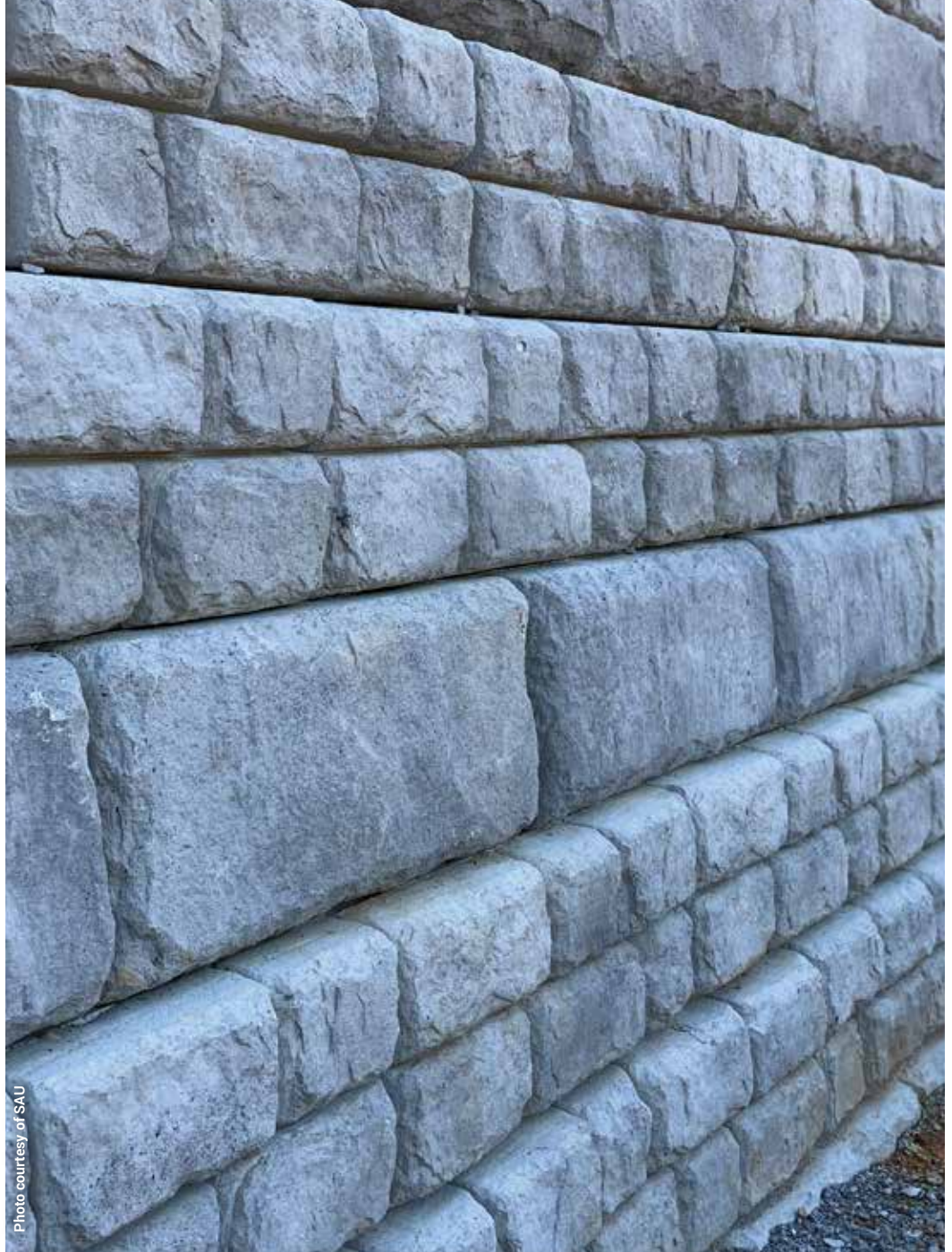


Photo courtesy of SAU

Precast Retaining Wall Attractive Highlight to

A new precast wall provides an aesthetic buffer to the new student center at Southern Adventist University.

By Mark Crawford

Southern Adventist University (SAU), nestled at the base of White Oak Mountain in Collegedale, Tenn., is a suburban community not far from Chattanooga. The school draws many of its students from the Tennessee-Georgia-Alabama tri-state region.

Having outgrown the original student center built in the 1970s, the university constructed a \$13 million building, the Bietz Center for Student Life, which features large areas for recreation and studying while also providing flexible space for spiritual activities.

After construction was complete, SAU contracted with Talley Construction, a road construction company in Rossville, Ga., and Bradley Tank and Pipe, a precast concrete supplier in Cleveland, Tenn., to install an attractive retaining wall to allow a parking lot to be built above and behind the building.

SAU's architectural firm, Michael Brady in Chattanooga, performed all the planning for the student life center.

"Included in their recommendations was a block retaining wall for this purpose," said Daniel Ford, a licensed general contractor and the large project superintendent for the university.

Due to the height of the wall and the costs associated with pouring on site, the design team decided a precast solution was the best option. They selected Redi-Rock, an engineered retaining wall system consisting of precast blocks of various sizes that can be customized to meet the requirements of many retaining wall projects. The aesthetic look of Redi-Rock walls also appealed to SAU because it "would add a new and attractive design to the campus," said Ford.

"Because we have done several Redi-Rock walls in the area, SAU was already familiar with the look of the products," said Andrew Butler, general manager of Bradley Tank and Pipe. "We have worked with Talley Construction on numerous projects in the past, ranging from Redi-Rock retaining walls to storm and sewer manholes."

A PRECAST SOLUTION

The project consists of two walls. The longer wall is 445 feet long with a maximum height of 13.5 feet; the shorter wall is 135 feet in length. A series of steps will be installed where the two walls intersect, creating access to the buildings behind the wall. More than 1,100 precast segments, ranging in depth from 60 inches to 28 inches, comprise the walls. Bradley Tank and Pipe will also supply stormwater catch basins and junction boxes for the project.

"The corners are somewhat unique in that there are seven 90-degree corners on the long wall," said Butler. "A corner by itself is not unusual – but having seven on one wall is probably the most we have ever had on a project."

Even though the blocks are designed to somewhat align themselves from front to rear,



Two walls totaling more than 550 feet long were manufactured for the project.

I Adds o University



Photo courtesy of Bradley Tank and Pipe

By combining limestone and cobblestone blocks, the wall creates a distinct look for the campus.

crews discovered there was plenty of room for them to move, so extra care was taken during installation. The corners also required some finesse.

“Two outside corners on the same wall seemed to be the most challenging, since the natural set-back of each course shortens the distance between corners as you go up,” said Ford. “We also discovered that when we got to the top, or to an end that is supposed to follow a grade, we needed to get creative with which block goes on top, to create nice grade transitions behind the wall.”

The most unique feature of the wall is the combination of cobblestone- and limestone-faced blocks that create a pattern along the length of both walls.

“The landscape director at SAU had seen the look before and liked it,” Ford said. “We also



thought the pattern would minimize the magnitude of the wall. In fact, mixing the limestone and the cobblestone actually helped us get the materials faster.”

Butler noted there were some challenges with the timeline, mostly due to the weather.

“Normally, weather conditions are not too much of a problem,” he said. “With an early January start, however, we contended with cold weather, which did slow our progress. Being proactive in our production allowed us to stay ahead on this project.”

“Also, maintaining open lines of communication with team members makes all the difference in the world. Josh Carter, the superintendent for Talley on this project, always worked with us to get whatever he needed, as quickly as possible.”

Ford said another delay in the project was “rain, rain and more rain.” Working around students, however, was not an issue.

“Even though we are an active campus, the construction area is completely fenced off to the general public, so there have been very few conflicts,” he added.

MORE PROJECTS TO COME

Butler said Bradley Tank and Pipe is thrilled with how the wall turned out and plans to showcase the pattern and design for other projects and potential clients.

Ford said the success and aesthetics of the project have led to the university looking at doing more work with Redi-Rock in the future.

“Personally, I really like the look of the product and have heard many positive comments from others here on campus,” he concluded. “We have several areas of old railroad tie retaining walls that are in serious need of repair. Redi-Rock is a product that we are seriously considering for this upcoming work.” **PS**

Mark Crawford is a Madison, Wis.-based freelance writer who specializes in science, technology and manufacturing.

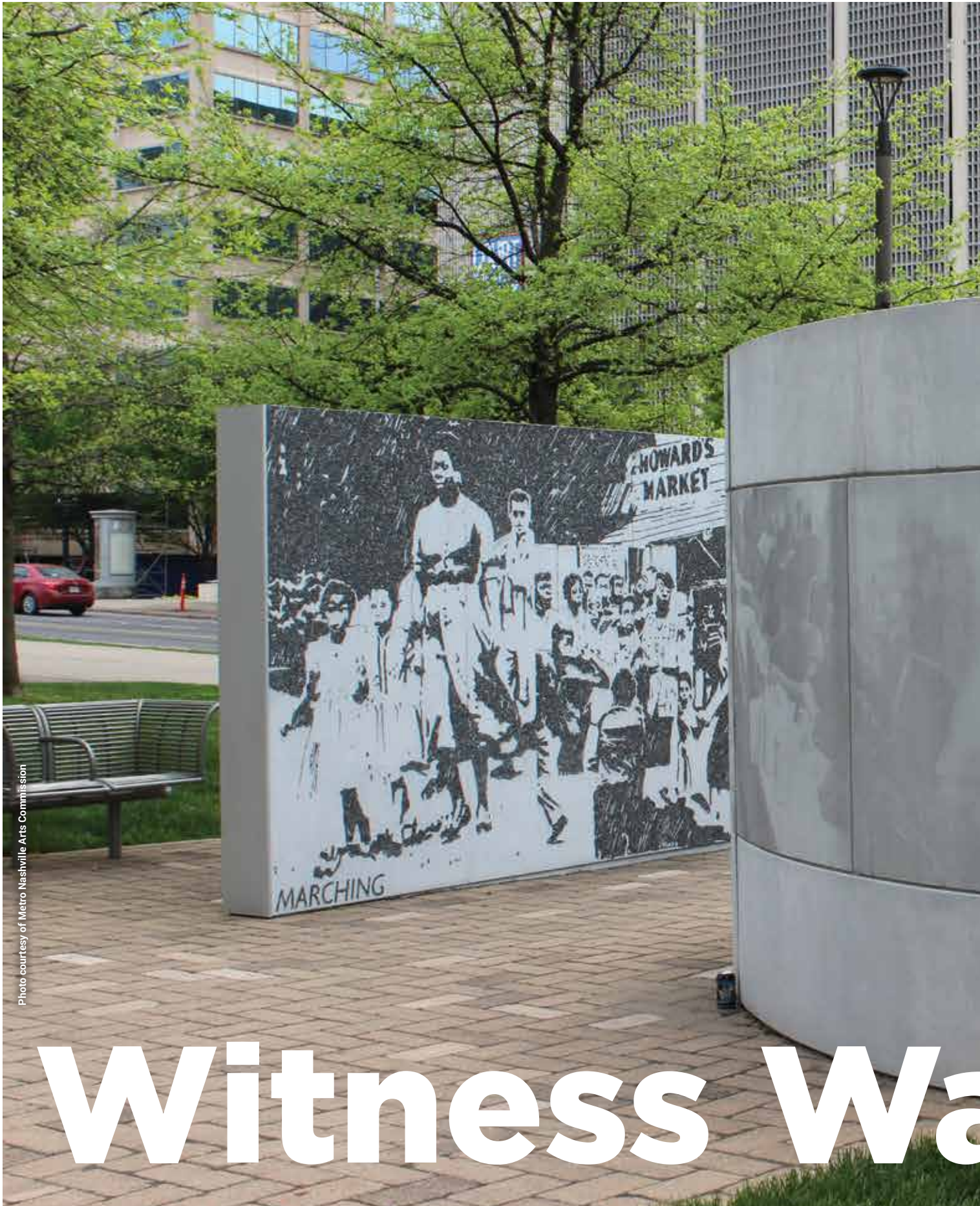


Photo courtesy of Metro Nashville Arts Commission

Witness Wa



alls

An artist used precast concrete to create a moving tribute for Nashville's Civil Rights Movement.

Memorializing Nashville's Civil Rights Movement through a photo-embedded precast concrete public art installation.

By Bob Whitmore

Photo-embedded precast concrete walls feature newspaper photos from the 1960s.

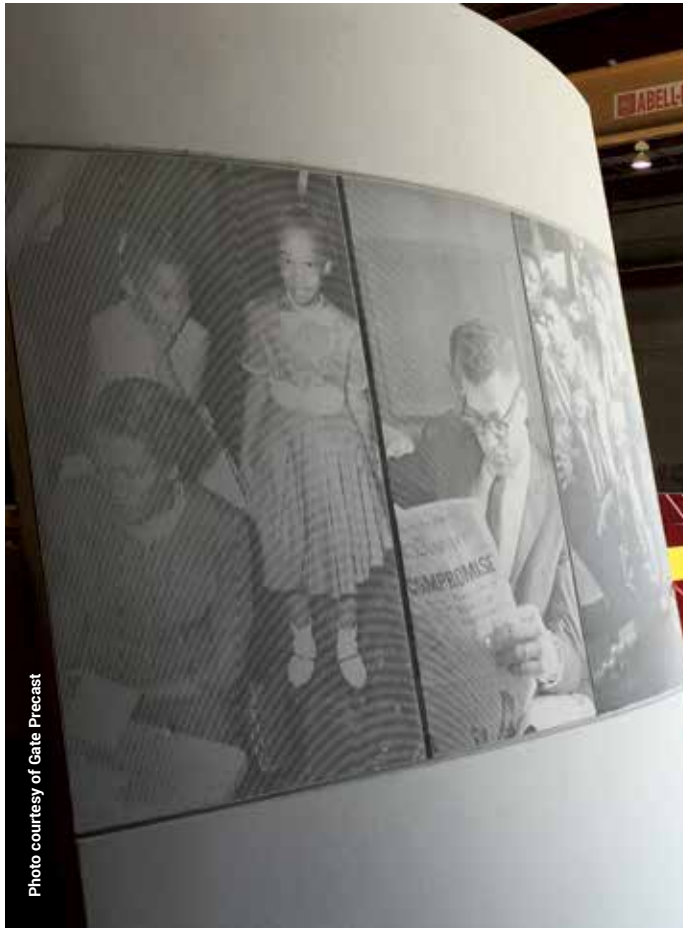


Photo courtesy of Gate Precast

It began with a student protest march after an attempted firebombing at the house of a prominent civil rights attorney. More than 3,000 college students assembled the next morning at Tennessee Agricultural & Industrial State University and silently, peacefully walked 3.5 miles to the courthouse in downtown Nashville, according to an article in the city's daily newspaper. It was April 19, 1960.

Like many Southern cities, Nashville had long been grappling with Jim Crow, and a nonviolent protest movement – incubated at the city's historically black colleges and universities (HBCUs) – had led to student sit-ins at lunch counters and other protests prior to the march.

Nashville Mayor Ben West met the marching students outside the courthouse. When one of them asked if the lunch counters should be desegregated, he replied with a simple, “Yes.” The mayor's affirmation of the students continued Nashville's push for racial equality and solidified its place at the forefront of the civil rights movement – a movement now memorialized by a public art installation anchored with four photo-embedded precast concrete structures known as the *Witness Walls*.

Dedicated in a public ceremony on April 21, 2017, in front of the courthouse and just steps from where the student protest ended, the Nashville *Witness Walls* multi-modal civil rights installation draws on the work of acclaimed artist Walter Hood, an internationally known landscape architect enlisted by the Metro Nashville Arts Commission (Metro Arts).

HISTORIC IMAGERY

Anne-Leslie Owens, public art and placemaking project manager for the Metro Arts, said Hood's concept of incorporating period images from the *Nashville Banner* newspaper archives into a set of precast



The team at Gate Precast power washed the flat panels to reveal the aggregate that creates the image.



Photo courtesy of Metro Nashville Arts Commission

concrete structures was the unanimous choice of the city's citizen panel during the selection process.

"The concept of the *Witness Walls* came from Walter," Owens said. "One of the reasons it was so exciting was his use of imagery. He thoroughly went through the archives and ended up with a concept that wasn't necessarily highlighting key individuals or singular events. Instead he did it a little differently. He chose two

narratives – a sitting narrative and a narrative of marching."

Hood said he settled quickly on concrete as the medium for the wall.

"It's a 20th century material," he said. "I didn't want something that was 'precious,' like stone. Concrete had a resonance with me as something of its time. I didn't want to create images that felt precious, and the concrete seemed to have this ordinariness." The ordinary

Curved panels with a high contrast between aggregate and cement create collages that move with visitors as they walk around the exhibit.



Photo courtesy of Metro Nashville Arts Commission

nature of concrete fed into Hood’s plan to honor everyday people rather than historical icons in creating the tribute.

“When you look around the world, concrete is everywhere, but it’s almost like we never give any thought to the ways in which we can express it,” Hood said.

In researching a concrete manufacturer for the public art installation, Hood said he was drawn to Gate Precast’s work on large architectural pieces. While the scale for *Witness Walls* was small compared to most of Gate’s projects, Hood visited with the precasters and found, “people there who were interested in figuring things out.” Once engaged in the



Photo courtesy of Metro Nashville Arts Commission

The Nashville *Witness Walls* were dedicated during a public ceremony on April 21, 2017.

project, they quickly started to generate ideas. From Hood’s two basic concepts of a sitting narrative and a narrative of motion came two different approaches to the finished surfaces.

“There are two different sides to the piece,” Hood said. “And that’s the nice thing about precast. We were able to create two different surface conditions.”

The photo-realistic sides of the panels show the static images. The motion sides of the panels are more abstract and rely on contrasting colors between the aggregate and the finished concrete surface to reveal collage images created by the artist.

THE LITERAL AND THE ABSTRACT

Marshall Bassett, P.E., sales engineer, said the Gate team talked with Hood at the start of the process and began working through the possibilities.

“We settled on a form liner that had a photo-realistic imprint,” Bassett said. “As the project kind of morphed, there were two aspects to it. There was a photo interpretation – the more literal interpretation – and then there was more of a visionary.”

The literal and the abstract. Working with the artist, the Gate team proposed two distinct production processes to bring Hood’s two concepts to life. They settled on four walls – eight sides of



THE MUNDANE, RENDERED EXTRAORDINARY

In an artist's statement on the *Witness Walls'* website, Hood elaborated on his motivation, stating, "These events were not only part of the greater civil rights movement in the United States, they were formative in it. Many young African American leaders were shaped by the progressive teaching at the historically black colleges and universities in the city. It was here that many young leaders could start to discern the road to integration.

"This sculpture places you, the visitor, among the heroic people who took place in this march and in the events that preceded and followed it in Nashville's Civil Rights Movement," Hood continued. "It allows you to engage with them in the mundane actions of sitting and standing, rendered so extraordinary by their intent: desegregation."

graphics – 7-foot-6-inches tall. Two flat walls represent the literal interpretation. Gate's team used a relief process, creating stencils to replicate the photos. The two curved walls were constructed from four radius panels for each wall to accomplish the narrative of motion. The curved panels reflect the light and play off the viewer's angle of vision. At a distance and in certain light, the collages almost disappear. But as the visitor walks through the installation and sees the panels from different angles, the images come to life.

To create the curved panels, Gate used a very fine ribbed form liner.

"If you look at it in cross-section, the ribs are probably three-eighths to a quarter inch in amplitude," Bassett said. "The manufacturer has a machine that mills down the ribs in the form liner to create the outline of the image. What they're doing is playing with light. They're playing with shadows and light."

Finding the right mix design for both types of surfaces proved challenging.

"We wanted to have a very high contrast value between the aggregate and the cement matrix, which ultimately drove the mix design," Bassett added. "Our aggregate was very dark, but from the outside the matrix was a light gray, so that gave us the contrast we

were after. We went back and forth quite a bit on the finishes and the mix design."

For the flat panels, Gate's team used stencils to replicate the images by crafting wood forms, which proved both time-consuming and challenging. It involved a lot of manhours cutting and pasting wood pieces onto forms to accomplish each image.

"It was a very labor-intensive project," said Bill Henderson, vice president and operations manager at the Ashland City plant. "One man was dedicated to each mold, which took several days to a week each to prepare for casting."

The Gate team got a big assist from Hood, who provided detailed modeling and renderings, Henderson said.

STEPS AWAY

The Metro Arts manages the installation, which hosts thousands of visitors every year.

"The site itself is very significant," Owens said. "It is steps away from the site of the student-led protest. When we were offered this site, we just really knew that it was going to work out well.

"It's a corner of the Public Square Park that we were able to activate in a really meaningful way."

Two pedestals with slanted, mirrored tops are stationed along



the path and include the words *Witness Walls* cut out and backlit by LEDs at night. Civil rights-inspired period music plays each hour, Owens said.

The Courthouse and *Witness Walls* are among six sites in Nashville on the U.S. Civil Rights Trail, which draws all types of visitors – folks on tours led by Nashville’s civil rights veterans, student groups and Nashville tourists who are just passing by.

“I think people are at first curious,” Owens said. “The abstract compositions with the aggregate – those are really the walls that you see first, because there’s such a contrast – the dark and light. Those are the ones that really pull you in and make you think, ‘What’s going on there?’”

“And the shape of the walls themselves – the curved walls help to invite you in and beckon you to come in and explore. And so, I suspect that’s a lot of people’s first thoughts, just being curious about the artwork,” Owens added. “And then they come in and there’s probably surprise when they start walking around the shadow graphic walls – the curved walls – and see, oh, an image popped out. That’s a pleasant surprise to see the images emerging as they walk around the walls.”

Learotha Williams Jr., Ph.D., associate professor of African American and Public History from Tennessee State University, summed up his view of the public art installation in a presentation at the Tennessee State Museum earlier this year, calling it, “One of the most remarkable monuments I’ve seen to civil rights.”

INVESTED IN THE PROJECT

The meaning of the project did not go unnoticed at the Gate Precast plant. The production crew, including the carpenters and artisans who crafted the walls, were all invested in the project.

“All of our people were aware of the significance of the project

The combination of curved and flat panels invites people to check out the exhibit and move through to see all the images.





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and take great pride in whatever they create,” Henderson said. “Many of our employees have gone down to visit the site and are pleased with how it turned out.”

Some of Nashville’s veterans of that civil rights movement 60 years ago are still active. They were the citizens who talked to council members and started the conversation that led to the *Witness Walls*. And they were the guests of honor at the dedication. Many of those who were involved in the lunch counter sit-ins and Freedom Rides of the period are now memorialized in this public art project.

“It was a unique experience,” Bassett noted. “When you work on a Class A building you don’t get any feedback, right? People just go in and out. You might get industry recognition for the quality and the uniqueness of the building, but something like this, where you get to see the community reaction, was spectacular.

“Especially during the reveal, just to see the folks and their reaction to it was pretty cool. It’s a great tribute. It was long overdue to have that acknowledgement, and we were just lucky to be a part of it. And you know, concrete is a perfect medium for that. We were able to accomplish just what the artist was looking for.”

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Precast Concrete MSE Walls Right on Cue in Kansas City



The Kansas Department of Transportation turns to more than 200,000 square feet of precast concrete MSE wall panels to complete its first-ever design-build project.

By Mason Nichols

“Traffic” – it literally and figuratively carries a lot of baggage. It’s a term that tends to conjure up bad memories, denote extended periods of waiting and remind most of the world’s population just how difficult driving through a crowded corridor can be.

In the world of construction, traffic also represents an opportunity for improvement. In the case of the Johnson County Gateway project in Kansas, reducing traffic issues for the more than 230,000 vehicles that pass through the Interstate 435, I-35 and Kansas 10 interchange just outside of Kansas City each day was the goal. And thanks to more than 200,000 square feet of precast concrete MSE walls – along with close collaboration between the project’s joint-venture team, engineer and precaster – traffic

is no longer a major issue for one of the most significant transportation hubs in Kansas.

SETTING THE STAGE

With plans calling for a project of sizable scale, the Kansas Department of Transportation turned to Gateway Interchange Constructors, a joint venture of Kansas City-based Clarkson Construction and Kiewit Infrastructure. According to Bryan Wilkerson, Clarkson’s senior project manager, the \$300-million project was the first design-build job for KDOT and the largest Clarkson has ever completed with the DOT.

“We had several design companies to integrate into the project along with the owner, subcontractors and precaster,” he said. “To

Precast concrete MSE walls help alleviate traffic congestion in the Kansas City area.

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Photos courtesy of PRETECH Corp.

More than 200,000 square feet of MSE panels were produced for the Gateway project, 10 times larger than a "large" project for PRETECH Corporation.



get everyone working together was the main challenge. But once we understood everyone's roles and responsibilities and started trusting one another, we could work through everything without issue."

Central to the success of the project was the ability of PRETECH Corporation, the project's precast manufacturer, to efficiently produce 5,000 MSE wall panels needed to construct 22 new and five rehabilitated bridges across the interchange. Bill Bundschuh, owner and president of PRETECH, said that type of large-scale production required ingenuity.

MAKING IT HAPPEN

Prior to the Gateway project, PRETECH considered a job with approximately 20,000 square feet of MSE panels a "large" project.

This job was 10 times that size. As Bundschuh explained, considerable changes were needed at PRETECH's plant to make it happen.

"We have quite a bit of land here, but there just wasn't enough for this project," he said. "We had to rent a few acres from the paving contractor across the street."

In addition to all the extra space needed for storing inventory,

Bundschuh had to facilitate changes to accommodate the heightened production, which on a typical day included anywhere from 12 to 24 panels.

“We reorganized our plant so that we could fit more forms in it, and also constructed a lean-to underneath one of our 50-ton cranes so that we could pour some panels outside,” he said.

PRETECH also maintained efficiency by developing and implementing a special tracking system. This allowed the team to quickly identify not only what shipment each panel was designated to go out on, but also where each panel would be installed upon arrival at the job site.

A SINE OF TEAMWORK

PRETECH’s established relationship with Inventure Civil, engineer for the Sine Wall system used on the project, was imperative in navigating the design-build work. The two companies had partnered together on smaller jobs in the past and relied on prior efficiencies and their previous experiences to scale to the larger size. Specifically, PRETECH made heavy use of Inventure Civil’s technology platform to track progress and monitor design changes on the fly.

“When we’d get on the system, we could easily tell which panels we had made and which we had delivered,” Bundschuh said. “This allowed all parties to continuously be in the know. We could also make changes based on what we had manufactured or shipped on any given day.”

Ed Austin, vice president of sales for Sine Wall, worked closely with Bundschuh on the project. In addition to the close collaboration between PRETECH and Inventure Civil, he stressed the involvement of Gateway Interchange Constructors as key to ensuring the project’s success.

About one-third of the way through the work, officials with Gateway identified a need to increase the rate of production. To quickly address the issue, the groups came together and

discussed exactly what they needed to ramp up.

“Gateway told us what they needed, and PRETECH found a way to get it done,” Austin said. “That team environment – the three-legged stool – only worked so well because everyone worked together.”

BUILT TO LAST

According to Austin, the MSE wall panels specified for the project’s bridges are designed to last 75 years, allowing drivers to work their way through the interchange with decreased traffic and increased safety for decades to come.

“Precast concrete MSE retaining walls are the most cost-effective solution among all retaining wall systems,” Austin said. “It’s a system that saves on cost, and precast offers both fantastic durability and appearance.”

Wilkerson echoed Austin’s assessment, pointing to safety as one of the key advantages of precast as the specified material for the project.

“What precast allowed us to do was save time on the schedule and reduce costs by eliminating a lot of field labor,” he said. “Using precast was also a safer way to construct the job because it minimized the amount of time that we were out building bridge substructures in the middle of traffic.”

Since the job was completed in 2016, it addressed more than 90% of the existing traffic problems in the area. And while additional work is planned for the corridor for the future, all parties involved enjoyed the benefits that only precast concrete can bring to a project as massive in importance as it was in scale. **PS**

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



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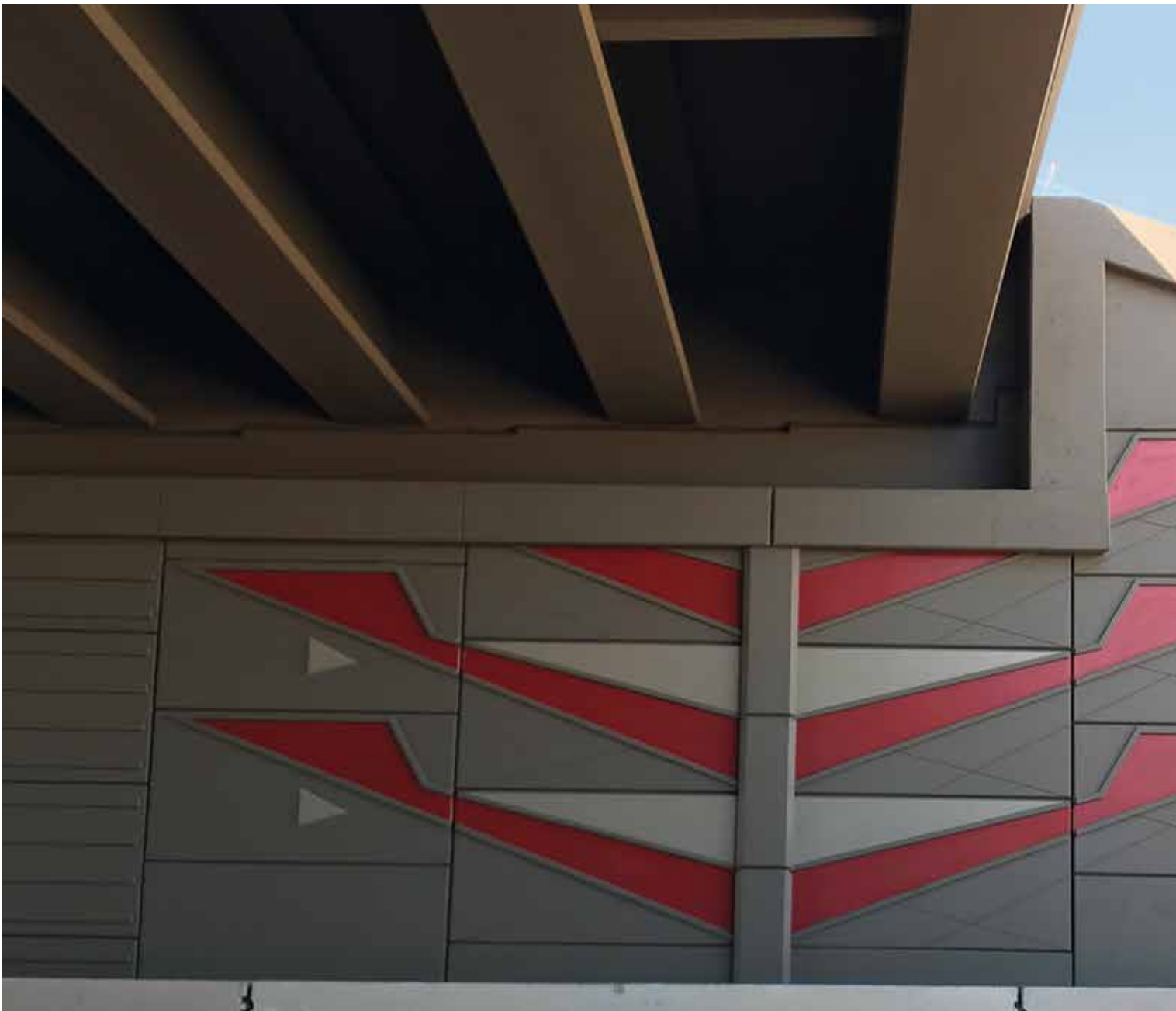
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South Mountain F Bridges History w Modern-Day Cons



Freeway with Construction

A design-build Arizona freeway brings to life Frank Lloyd Wright's early designs.

By Sara Geer Photos courtesy of ADOT

When drivers travel the newly constructed Loop 202 South Mountain Freeway in Arizona, they will witness history as Frank Lloyd Wright's early experiments in desert architecture are featured throughout the design-build project.

The 22-mile corridor provided a unique opportunity for the Arizona Department of Transportation and developer Connect 202 Partners to work with the Frank Lloyd Wright Foundation to apply new aesthetic design concepts appropriate to the area.

BRINGING HISTORY TO LIFE

Joseph Salazar, ADOT's project landscape and architecture coordinator, explained that in the late 1920s, Wright built a winter encampment, named Ocatillo, near the new freeway location at the foothills of South Mountain, part of the East Valley region of Phoenix. A common feature of Wright's structures was his frequent use of horizontal lines, which is boldly expressed in the wooden walls of the camp that echo the flat desert floor and long horizons.

To enhance the designs seen specifically on the 40 overpass bridges, uniquely designed precast concrete MSE walls were manufactured and installed. As an homage, horizontal lines serve to influence the design, which features the lines along all the MSE walls. This contrasts

Sharp horizontal lines give these MSE walls in Arizona a striking look and pay homage to Frank Lloyd Wright's work in the state.





Oldcastle Infrastructure produced approximately 700,000 square feet of MSE wall panels for the South Mountain Freeway project, with nearly every panel requiring custom dimensions and design elements.

with the vertical lines of other Phoenix-area freeways.

“With this in mind, ADOT consulted with the Frank Lloyd Wright Foundation to provide context-sensitive design aesthetic features for the freeway bridges, landscape and other freeway elements,” Salazar said. “The freeway aesthetics will attempt to tell a story by showing difference in land uses, land forms and history as you progress throughout the freeway’s different segments.”

NO SMALL TASK

Approximately 700,000 square feet of MSE wall panels will be installed for the project, which is more surface area than the retractable roof at State Farm Stadium, home of the Arizona Cardinals. Oldcastle Infrastructure’s plant in Chandler, Ariz., manufactured the wall panels, while Reinforced Earth Company provided the formliners, forms and panel accessories. Production officially started in 2017, and the last wall panel was poured April 2019.

Justin Folts, Oldcastle Infrastructure fulfillment manager, said nearly every MSE wall panel had a custom dimension and design element. Different formliners were used while casting the wall panels, which made it challenging to plan which forms could be poured that day and for which panel. Some panels also included exceptionally tight tolerances depending on where they were being installed on the job site.



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The project was the largest highway project in Arizona's history and provides a direct link for commuters wanting to avoid Interstate 10.



“Some were corner panels or below grade or we may have even had to build different headers for different cut panels,” Folts said. “The whole project required a lot of quality control to ensure each piece was correct. As an architectural piece, everyone was paying attention to the details.”

A mix design that had already been approved by ADOT was used to cast the panels. The mix design had a higher strength than required, but it allowed production staff to strip product earlier and move it around the yard without causing damage. Prefabricated mesh increased production efficiency and eliminated manual wire tying.

Since the production crew was more accustomed to working on underground precast concrete products, there was a learning curve involved at first. Folts said communicating regularly with the production team and stressing the need to maintain tight tolerances helped make the project a smooth experience for all.

Another solution that improved efficiency



was the plant did not ship product to the job site until an entire wall was cast. In addition, if the project at any given time had to move faster, construction could continue without waiting for product deliveries.

“Overall it was a cool project to work on since once we produce most products and send them out, we never see them again because they are buried underground,” Folts said. “So, it’s nice to see our work displayed since a lot of the freeway is still under construction. We have a few people that drive on it and come back to the plant talking about it.”

According to Salazar, the freeway is divided into five distinct aesthetic areas. Once the panels were installed on the job site, they were sandblasted and painted. An earth tone base paint used throughout the project complements the color of South Mountain, the desert terrain and the area’s vegetation. Several accent colors enhance the designs seen in each of the five segments. For example, the Ahwatukee Foothills/Cholla Ocotillo segment features desert plants and simple shapes, while aesthetics and landscaping in the Laveen village/River Bank segment feature the area’s agricultural heritage.

Other precast concrete products manufactured and installed on the South Mountain Freeway included bridge deck panels and more than 1,000 girders.

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Once panels were shipped to the job site, they were sandblasted and painted to give the iconic look the design team desired.

HISTORIC AND HISTORY-MAKING

Dustin Krugel, ADOT's public information officer, said the South Mountain Freeway is the largest single highway project in Arizona's history. The freeway provides a direct link for commuters traveling between the East Valley and West Valley, a much-needed alternative to taking Interstate 10 through downtown Phoenix.

The project is also the state's first public-private partnership on a highway, and the first time right-of-way acquisition and utility relocation have been included in the design-build portion of the project. Public private partnerships make it possible to deliver much-needed transportation projects on an accelerated schedule and reduce the overall

cost of the project, which can be passed onto taxpayers or savings for other transportation projects.

"Had the project been delivered under traditional project-delivery methods, the project would have been split into several small projects, which would not be efficient since work would be split by several contractors and take more time to complete," Krugel said. "By keeping one development team, the South Mountain Freeway can be accelerated and taxpayers, ADOT and the developer will reap the cost savings by not having to tie up resources, personnel and equipment to the project." **PS**

Sara Geer is NPCA's communication manager and is managing editor of Precast Inc.



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