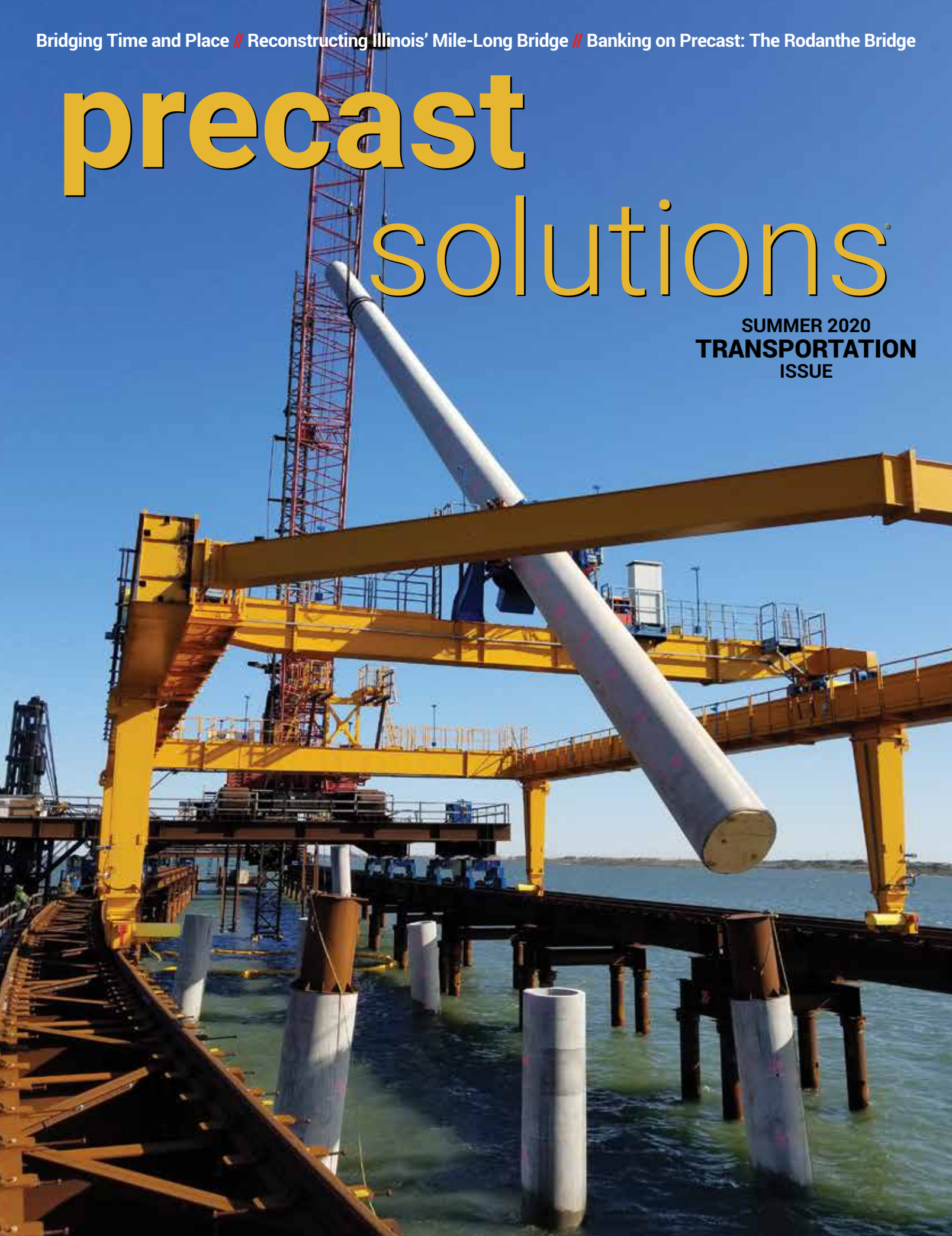


Bridging Time and Place // Reconstructing Illinois' Mile-Long Bridge // Banking on Precast: The Rodanthe Bridge

# precast solutions®

SUMMER 2020  
TRANSPORTATION  
ISSUE



# precast solutions

SUMMER 2020  
VOLUME 18 | NUMBER 3

## ON THE COVER:

**On the cover:** Precast concrete and innovative construction methods were used to construct the Rodanthe Bridge in North Carolina.

Photo courtesy of Flatiron Construction.

Precast Solutions  
(ISSN 1934-4066 print, ISSN 1934-4074 online)  
is published quarterly by NPCA,  
the association of the  
manufactured concrete products industry.

Material in this publication may not be reproduced without written permission from NPCA. Requests for permission should be directed to the managing editor.

© 2020 NPCA

### Publisher

Frederick H. Grubbe, MBA, CAE

### Executive Editor

Kirk Stelsel, CAE

### Managing Editor

Matt Werner

### Technical Editors

Eric Carleton, P.E.

Phillip Cutler, P.E.

Claude Goguen, P.E., LEED AP

Kayla Hanson, P.E.

Alex Morales, M.Ed.

### Graphic Designer

Deborah Templeton

### Advertising

Brenda C. Ibitz

(317) 571-9500

bibitz@precast.org

### NPCA

#### Precast Solutions

1320 City Center Dr., Suite 200

Carmel, IN 46032

(800) 366-7731

(317) 571-9500 (International)

Email: npca@precast.org

*Acceptance of advertising does not imply NPCA's endorsement of the product. NPCA reserves the right to reject advertising copy and does not accept responsibility for the accuracy of the statements made by advertisers.*



This publication is designed to provide accurate and authoritative information in regard to the subject matter covered; however, National Precast Concrete Association and Precast Solutions act as mediators without approving, disapproving or guaranteeing the validity or accuracy of any data, claim or opinion appearing herein. Information is provided and disseminated with the understanding that National Precast Concrete Association and Precast Solutions are not engaged in rendering engineering, legal or any other professional services. If engineering, legal or other professional assistance is required, the services of a competent professional should be obtained. National Precast Concrete Association and Precast Solutions do not assume and hereby disclaim liability to any person for any loss or damage caused by errors or omissions in the material contained herein, regardless of whether such errors result from negligence, accident or any other cause whatsoever.



Photo courtesy of Flatiron Construction

## WHAT'S INSIDE

### Specifier Q&A

5

This issue, Precast Solutions hears from Daniel J. Kurdziel, P.E., MBA, with VS Engineering.

### Bridging Time and Place

7

Precast concrete plays an important role in replacing a historic bridge on a busy trade route while protecting area wildlife.

By Shari Held

### Reconstructing Illinois' Mile-Long Bridge

10

Spanning 187 feet in length, giant prestressed beams play a key role in helping to ease traffic congestion on Illinois Tollway's busiest roadway.

By Bridget McCrea

### Banking on Precast: The Rodanthe Bridge

14

Large-scale precast concrete products and innovative construction methods are key to the construction of 100-year bridge in North Carolina.

By Mason Nichols

### Precast Concrete Critical to Massive Virginia Project

22

Sound walls push the boundaries for an interstate expansion project near Washington, D.C.

By Matt Werner

# Precast Concrete Massive Virginia F

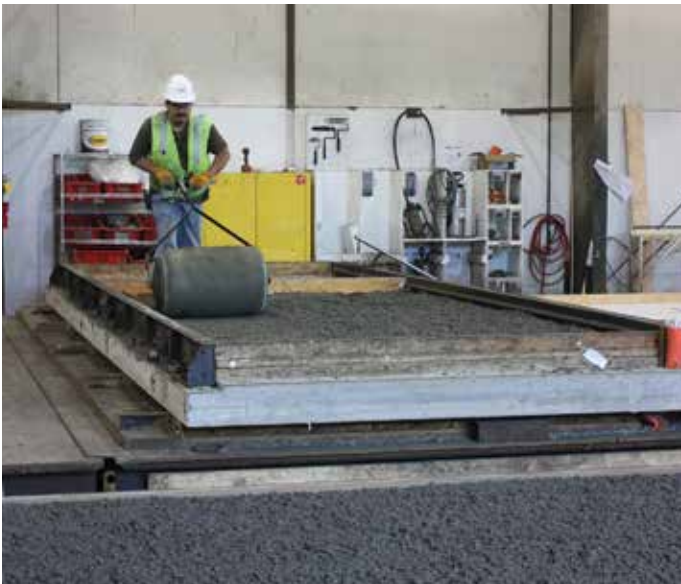


# Critical to Project

By Matt Werner

Photos courtesy of Smith-Midland





Planning and coordination are crucial in the construction industry, and one Virginia project that is transforming the Washington, D.C., area is highlighting those efforts between the contractor, precaster and state officials.

As a stretch of more than 22 miles of interstate is being transformed to allow for more cars, buses and other transit options, the need for sound walls is paramount. With timelines to meet and installation needing to go as quickly and smoothly as possible, precast concrete became a key factor in the project.

## TRANSFORM 66

Interstate 66 is the only interstate west of Washington, D.C., connecting to northern Virginia, carrying thousands of cars every day as commuters make their way inside the Beltway. With major congestion occurring daily on both the interstate and feeder roads, the state entered a public-private partnership to transform the critical highway.

FAM Construction LLC, a joint venture company of Ferrovial Construction US and Allan Myers, serves as the design-build contractor for the \$2.3 billion project, which isn't just expanding interstate but turning it into a multimodal corridor.

"The project will result in two new express lanes alongside three general purpose lanes in each direction, auxiliary lanes, major interchange improvements, new and expanded park-and-ride lots and multiple segments of a corridor-wide shared use path," said Nancy Smith, spokeswoman for FAM. "The project also will preserve the median for future mass transit expansion."

The project's success depended on the ability to produce 1 million square feet of precast concrete sound walls quickly and efficiently, and NPCA member Smith-Midland was able to meet the challenge.



Smith-Midland is manufacturing more than 1 million square feet of sound walls and retaining walls for the Transform 66 project near Washington, D.C.

## TRANSFORM 66 OUTSIDE THE BELTWAY

The following firms were involved as part of the public-private partnership:

- Virginia Department of Transportation
- Department of Rail and Public Transportation
- I-66 Mobility Partners:
  - Cintra
  - Meridiam
  - John Laing
  - APG

# LET'S BUILD

# YOUR IDEAL STRUCTURE



**SUPERIOR**  
BUILDING SOLUTIONS  
FOR OVER  
**40 YEARS**

INDUSTRY-LEADING WARRANTIES  
ENERGY-EFFICIENT DESIGNS  
EXPERT CONSULTATION  
METAL AND FABRIC BUILDINGS

**ClearSpan**  
www.clearspan.com  
1.866.643.1010

## LEAN MANUFACTURING TESTED

For Smith-Midland, a typical sound wall project is around 30,000 square feet, making this more than 3,200% percent larger than what they typically do.

“We may have 100 bays and 200 to 300 panels for a typical project,” said Alex Burkhart, Smith-Midland’s project manager. “With this we’re talking over 50 different sound walls and thousands of panels.”

Luckily, Smith-Midland was brought on early and had several preliminary conversations with FAM about when panels would be needed. Those conversations were critical for a company that prides itself on lean manufacturing techniques.

“We had about 1,000 of the ‘typical’ panels in production before everything really kicked off,” Burkhart noted. “We knew that we were going to have a set amount of the ‘typical’ panels, so we went ahead and started making those to get ahead of the curve.”

Being able to get a jump on production was a big benefit of using precast for the project.

“Using precast panels allowed material production to begin while the project was still in design, which helps to save time, particularly on a project of this scale,” Smith said. “Additionally, using precast panels allows for better control of the finish, for adherence to the project’s aesthetic plan.”



Panel sizes for the project range. The typical panel is 23 feet wide and 8 feet tall, and they get as tall as 12 feet. Most panels have a vertical rib pattern finish, but some have an ashlar dry stack finish.

“In the dry stack wall, there’s a sequence to it where there’s 15 dry stack panels and then five panels in a row that have a dogwood flower pattern at the top,” Burkhart explained. “We’ve done that on other projects to give a little more visual aspect to it.”

In addition to the sound walls, Smith-Midland is manufacturing more than 200,000 square feet of retaining walls. The retaining wall panels exposed to public view have either a smooth or bush hammer finish to create more aesthetics.



Installation and manufacturing of the panels continues, and the project is scheduled to be complete in 2022.

## PRODUCTION, STORAGE BOUNDARIES PUSHED

Production of the sound wall panels is ongoing with Smith-Midland manufacturing 16 panels per day, but it took some time to get to that point.

“There’s always a learning curve with it,” Burkhart said. “You can’t just throw on the switch and start making 16 panels a day. We started slow with about four per day, then went to eight and in the span of about three weeks we had it up and running.”

As the company was finishing up another large sound wall project, Burkhart said they worked to get as much optimized between the two to make production for both easier. Things like reinforcement design were matched between the two to promote lean manufacturing.

With such a large project, production space and storage space at the yard was at a premium, resulting in a five-acre expansion to Smith-Midland’s yard and property.

“The expansion to the property and yard had been in the long-term plan,” Burkhart noted. “This contract definitely put a little bit of feet to the fire in getting it done.”

Burkhart said the shop arrangement changed regularly to accommodate casting new panels and production, but it was not anything out of the ordinary.

## INSTALLATION CONTINUES

Production on the sound wall panels began in late 2018, and product still is being shipped and installed. The target completion date for the entire project is 2022.

The job site is only about 30 minutes away from the plant, so Burkhart heads out three or four days a week at times to make sure things are going smoothly on site. Smith said the installation has been going well, and they are happy with how the project is progressing.

Once complete, the project will provide faster, more reliable travel and move 2,000 to 4,000 more people per hour. Safety will also be improved throughout the corridor, and the project sets up future transit expansion with additional bus routes, as well as 4,000 additional park-and-ride spaces. **PS**

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

# Why Choose Easi-Set Worldwide Licensed Products? We can answer that in three words.



**J-J Hooks**<sup>®</sup>  
SAFETY BARRIER



**SoftSound**<sup>™</sup>  
Superior Sound Absorptive Technology

**Capability:** As a licensing leader in the precast industry, with decades of experience, our expertise in technology transfer streamlines product design and manufacturing processes to maximize the return on investment for both precasters and their customers.



**Commitment:** Continuing investment in R&D, training and ongoing support means our producers gain the advantage of the latest technology and testing.

**Credibility:** Our processes, engineering and products have proven their value in countless manufacturing facilities and on job sites across the globe for four decades.

**Precasters and their customers share a common trait when they choose Easi-Set Licensed Precast Products, successful projects.**



EASI-SET BUILDINGS • SLENDERWALL CLADDING • J-J HOOKS SAFETY BARRIERS • SOFTSOUND NOISEWALL  
Profit from Our Innovation. Call 800-547-4045 to learn more. [www.Easi-Set.com](http://www.Easi-Set.com)