

PROJECT SPOTLIGHT

Marsh Creek bridge replacement earns public works awards

The Marsh Creek Road Bridge Replacement project near Clayton, Calif., not only was named project of the year by the American Public Works Association's (APWA's) Northern California chapter but also won the national APWA 2019 Public Works Project of the Year Award for transportation for less than \$5 million.

Despite these accolades, Con-Fab California LLC in Lathrop, Calif., the precast manufacturer on the project, considers the project just a standard job.

"Our work scope was routine for California bridge girder fabrication and installation," says Brent R. Koch, PE, chief engineer for Con-Fab. "We performed the work with our standard high level of care and the attention to detail required to complete the work in conformance with the project plans and specifications and meeting the contractor's schedule."

One key to the success of the project, especially as it related to the time line, was the use of accelerated bridge construction (ABC) techniques, which ended up allowing the project to be completed in one construction season rather than two.

"The use of precast concrete girders allowed the project to be completed more quickly than if cast-in-place construction were used," Koch says. "Other aspects of ABC may have been applicable to the project, but the fabrication and installation of the girders for this project were not discernibly different from Con-Fab's perspective for how we perform our work for other bridge projects."

Each of the six precast, prestressed California bulb-tee concrete girders was 48 in. (1219 mm) wide, 48 in. deep, and 90 ft 3 in. (27.5 m) long, with a volume of 20.1 yd³ (14.9 m³) and a weight of 87,000 lb (39,500 kg).

While Koch reports that there were no significant challenges related to the fabrication of the girders for the project, there were some challenges with installation.

"Our main challenge was associated with the limited space available to set up the cranes at each end of the bridge combined with the requirement for the road to be open to traffic during the erection of the girders," he says. Traffic was stopped while the crew lifted each of the girders from the hauling units and set it into position. Then, once each girder was landed and the hauling unit cleared from the roadway,

traffic was allowed to pass through the site with one-way traffic control.

The key to success to smoothly meeting these challenges, Koch says, was the careful planning and development of the erection work plan with Bridgeway Civil Constructors, Bigge Crane, and Reeve Trucking, all of which followed the proper execution of the work plan.

—William Atkinson



Con-Fab installed the six girders for the Marsh Creek Road bridge replacement project near Clayton, Calif., in two stages. The second stage of girder erection on the accelerated bridge construction project is shown here. Courtesy of Con-Fab.



After Hurricane Sandy, Nassau County in New York replaced its police department's Eighth Precinct frame-and-brick buildings with precast concrete. The structure received the 2019 PCI Design Award for an All-Precast Concrete Solution. Courtesy of High Concrete Group LLC.

Nassau County builds for the future with total-precast concrete police precinct

Following the devastation that occurred with Hurricane Sandy in 2012, many structures that were owned by Nassau County in New York were evaluated for structural damage.

One specific series of structures that Nassau County targeted for replacement was its police department's Eighth Precinct, which consisted of 1950s-era frame-and-brick buildings. The goal was to replace these with modern structures that could not only withstand the onslaughts of future major events but also communicate civic pride.

As a result of the need for resiliency and visual appeal, the architect, LiRo Architects + Planners, based in Syosset, N.Y., opted for precast concrete. Precast concrete was also selected for logistical reasons because construction would need to take place in a long and narrow site, as well as the fact that the adjacent existing precinct building needed to remain open while construction of the new building was taking place. High Concrete Group LLC of Denver, Pa., was selected for the precasting work.

As a way to communicate civic pride and increase visual appeal, the heraldic lion that appears on the Nassau County seal was cast directly into the precast concrete facade using a computer numerical control-cut foam mold.

The facade also features exposed, buff-colored precast concrete panels with an acid-etched finish detail that reflect the traditional features found in other buildings in the community.

The first-floor panels are set off with a base of polished pink and gray Grigio Sardo granite. On the second and third floors, schoolhouse-red and dark manganese iron-spot thin bricks were placed in running bonds and soldier courses in order to organize the window openings and emphasize small changes in the plane.

"One of the main keys to success was coordinating the brick sizes versus the precast panel sizes," says Robert Pabst, vice president of sales for High Concrete. "There were some chal-

lenges to overcome with brick coursing, floor-to-floor heights, and panel layout, especially in a total-precast structure. We arduously worked with the design team to establish exact brick sizes and coursing that would perform well with the precast panel sizes and provide high quality, including recess, returns, precast sills, and header coursing."

Another challenge was finding repeating patterns for manufacturing the precast concrete panels, which was accomplished via a number of design coordination meetings, including informing the design team of the precast concrete manufacturing processes.

Yet another challenge related to the numerous finish elements required across the precast concrete panels. "Being a three-story building, our engineers designed a vertical load-bearing wall panel system for economy," Pabst says. "The panels included three types of brick, granite stone, precast profiles, and sandblast-finish precast concrete." The team achieved this with a combination of brick formliner, built-up forms, and granite with bond breaker.

Inside the facility, the design uses hollow-core slabs with 32 ft (10 m) spans supported by just six columns, to create expansive, open-floor areas. In addition, large "punched" windows in the concrete panels provide ample natural lighting.

In all, High Concrete manufactured approximately 270 precast concrete products, including 186 arch products and 85 structural products, as well as approximately 24,000 ft² (2230 m²) of precast concrete hollow-core slabs.

The structure received the 2019 PCI Design Award for an All-Precast Concrete Solution.

—William Atkinson 

High Concrete Group LLC of Denver, Pa., performed the precasting work on the Nassau County, N.Y., police department's new Eighth Precinct. Courtesy of High Concrete Group LLC.

