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2024 PCI DESIGN AWARDS

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Sustainable Design Award and Government and Public Building Honorable Mention

PROJECT TEAM

Owner: U.S. General Services Administration, Tampa, Fla.

PCI-Certified Precast Concrete Producer: GATE Precast Company, Ashland City, Tenn.

Architect: Fentress Architects (Design/Build AOR), Washington, D.C.

Lead Design Architect: Michael Graves + Thomas Miller Partners Joint Venture, Princeton, N.J.

Precast Concrete Specialty Engineer: InfraStructure, LLC, Omaha, Neb.

Engineer of Record: Thornton Tomasetti, New York, N.Y.

General Contractor: Hensel Phelps, Nashville, Tenn.

PCI-Certified Erector: Precision Stone Setting Company, Hiram, Ga.

PCI Associate Supplier: Heidelberg Materials, Irving, Tex.

Project Cost: $5.87 million for the precast concrete

Project Size: 280,000 ft²

FRED D. THOMPSON U.S. COURTHOUSE AND FEDERAL BUILDING

NASHVILLE, TENNESSEE

For the Fred D. Thompson U.S. Courthouse and Federal Building, the U.S. General Services Administration (GSA) desired a structure that would look classic, yet contemporary. This balance was achieved using a variety of precast concrete products, including panels, columns, and box beams.

DIGNITY AND STABILITY

Nearly every design component of the courthouse is reflective of the U.S. justice system. Overall, the building conveys a dignified and stately presence—the main façade is symmetrical, reflecting the need for balance in the courtroom. The panels are white, emphasizing the court system's ideal state as a conveyor of truth and balance in U.S. society and government. And overall, the structure is bold in appearance, symbolizing permanence and longevity. These choices were all critical for GSA, which wanted the courthouse to "reflect the importance of justice in our society and express a degree of transparency and accessibility to all people in a democracy."

GATE Precast Company of Ashland City, Tenn., manufactured the precast concrete products for the project. While the courthouse design inspires feelings of truth and balance, the structure's sustainability and resilience are equally impressive. To help ensure the building's security, the precast concrete components were designed to exacting requirements for blast resistance and progressive collapse. More than 700 different types of connections between the

Photos: Gabe Ford, Ford Photographs.

precast concrete façade panels were used to meet these specifications, and GATE ensured that connection locations and reinforcement were optimized to reduce blast loads. "Connection locations and precast concrete reinforcement were optimized to reduce blast loads at each connection" said Patrick Burke, FAIA, principal at Michael Graves Architecture & Design, the lead design architecture firm on the project. "Unique connection concepts were developed to resist the blast loads, which were significantly larger forces than traditional lateral loads, while considering serviceability requirements such as floor deflections and building drift."

The building was also designed to LEED Gold BD+C standards, with certification pending. The white precast concrete façade features photocatalytic concrete, which leverages a specially formulated cement capable of using the sun's rays to oxidize nitrogen oxides, a primary smog-causing compound. Thus, this special cement gives the concrete a self-cleaning ability. Air pollutants that would otherwise discolor the concrete surface are removed from the atmosphere and washed off during rain, resulting in reduced maintenance for the façade. To date, the courthouse is the largest photocatalytic structure in the United States.

"The photocatalytic cement reacts with the surrounding environment to effectively remove pollutants from the air, creating a twofold benefit that keeps its surfaces cleaner and abates organic and inorganic substances that are responsible for air pollution," Burke said. "This truly innovative advancement for green building technology literally cleans itself and the air around it."

Because the exterior of the building is constructed from resilient architectural precast concrete, the finish is essentially permanent. This resilience is reflective of the original design goals of the GSA and design-build architect of record Fentress Architects. It harkens back to the justice system's importance and permanence in U.S. culture while also ensuring a long-lasting, mostly maintenance-free building that will withstand the test of time. The result is a structure that is as imposing as it is elegant, and as elevated as it is rooted in traditional courthouse design.

"The most environmentally friendly building is one that doesn't need to be rebuilt," said Mo Wright, director of architectural systems for GATE Precast. "Too many projects today are designed and constructed with a much a shorter life expectancy, but here, there is little to no follow-up maintenance required for the life of the building."

KEY PROJECT ATTRIBUTES

- **Using a variety of precast concrete products, the courthouse's design is reflective of the permanence, balance, and dignity associated with the U.S. justice system.**
- **More than 700 different types of connections between the precast concrete façade panels were critical for achieving the blast resistance requirements set forth by the U.S. General Services Administration.**
- **Photocatalytic concrete gives the structure its white color while also providing a self-cleaning capability that minimizes maintenance and contributes to the building's longevity.**

PROJECT AND PRECAST CONCRETE SCOPE

- **This project converted an area formerly including parking lots and dated office buildings into a modern yet historic courthouse and federal building featuring precast concrete.**
- **The project included a wide variety of precast concrete products, including façade panels, columns, and box beams.**
- **Precast concrete production took place from May 2019 to May 2020.**