

Hollow-core structural flooring saves time on Massachusetts mixed-use project

The Assembly Row mixed-use complex in Somerville, Mass., features 600,000 ft² (56,000 m²) of retail space, 2.8 million ft² (260,000 m²) of office space, and 1800 residential units.

Block 5A of the project, called the Alloy Residences and Autograph Collection Hotel, features 122 high-end condominiums in a 13-story building with an underground parking structure. Block 6 features a 20-story, 273-unit apartment building, along with a six-story, 174-unit wooden structure and a seven-story, 650-car precast concrete parking structure. For several reasons, designers specified precast concrete hollow-core for the structural flooring systems in both block projects. They selected J. P. Carrara & Sons Inc. of Middlebury, Vt., for the work.

One reason was that hollow-core could be fabricated in a temperature-controlled environment, allowing for the erection of the structural slabs during winter months. This meant faster on-site erection time, ensuring quicker floor turnover to the interior/exterior framing contractors. Second, the structures rely on the hollow-core to support the exterior perimeter wall

system, eliminating the need for steel spandrel beams. Finally, hollow-core provided lower floor-to-floor heights than would be possible with conventional structural steel construction.

Approximately 1240 pieces of hollow-core, encompassing 206,000 ft² (19,100 m²), were erected for the Block 5A project. Each piece of hollow-core is 8 in. (203 mm) thick and 8 ft (2.4 m) wide. Similar hollow-core components were used for the Block 6 housing units, including 300,000 ft² (28,000 m²) of hollow-core in 1683 pieces.

Although both projects were a success, they weren't without some challenges, says Joe Gallese, project manager for J. P. Carrara. "Each girder slab project had its own unique production challenges," he says. "No two projects are the same. With two projects of this size being erected concurrently, there was no room for production errors. Project schedules were closely studied so that both projects could be produced and delivered on time."

In terms of transportation, a total of 1049 truckloads of hollow-core were delivered over the course of the two projects. Nearby staging yards were used so the company's drivers could deliver loaded trailers before the start of each day on the project site. Then, empty trailers were brought back to J. P. Carrara's facilities for reloading. "We provided detailed load lists to the erector and construction manager in order to communicate what was on each load," Gallese says.



Hollow-core structural flooring is being erected for the Assembly Row mixed-use complex in Somerville, Mass. J. P. Carrara & Sons Inc. provided the hollow-core, which made it possible to erect the structural slabs in winter and provided lower floor-to-floor heights than would have been possible with conventional structural steel. Courtesy of J. P. Carrara & Sons Inc.

There were virtually no challenges with installation. “The plank/steel erectors were the same crew for both projects, and they had erected our plank before,” he says. “It went very smoothly.”

—William Atkinson

Design-assist helps overcome challenges for precast concrete church project

The efficient and creative use of precast concrete played a vital role in the recent construction of the new 1200-parishioner St. George Catholic Church in Baton Rouge, La. The church was formally opened in March 2017 and now stands as an architectural beacon for the area’s Catholic community.

David Hebert, a principal at GraceHebert Architects in Baton Rouge and the project’s architect, credits Gate Precast’s efforts in the project, noting that Gate’s design assistance was critical to achieving the owner’s detailed design goals.

For example, Gate’s designers worked with project engineers to eliminate much of the steel that had been specified in the original design by using load-bearing precast concrete panels. “Through design-assist, we easily modified the panels to become load bearing instead of suspended from steel, which saved us nearly \$350,000 in steel costs,” says Hebert.

“Design-assist allowed Gate the ability to have some control over the ultimate size and shape of the panels in order to effectively handle the panels during transit and erection, but most importantly under working conditions in the field,” says Mitch Dees, project manager at Gate’s precasting facility in Monroeville, Ala., where the work was done.

Design-assist also helped create an aged limestone-and-brick motif, as well as several Gothic-style archways. Gate’s



Design-assist was used in St. George Catholic Church to create an aged limestone-and-brick motif. Courtesy of www.toddlandryphotography.com.

precasting facility was able to create the panels with an aged limestone appearance, incorporating tumbled thin bricks directly into the concrete.

“Including the aged limestone-and-brick motif was a very challenging process to achieve and replicate the desired look for our client,” Dees says. “Several production methods were tested before settling on a consistent means of providing an inconsistent aged limestone look within the panels and from panel to panel.”

One of the important keys to success in the project was that Gate used Revit, the same software that GraceHebert Architects used, “so we were all synced to the same model,” Hebert says. “We could do quick coordination checks on the fly. It was the perfect way for us to get everyone on the same page.”

Despite the value of design-assist and the Revit software, the project still faced some challenges, Dees says, especially from a forming and placing perspective, due to the complicated shapes of the three-sided column wraps. “Careful attention was needed during the placing of concrete in these intricate molds and aligning these unique-shaped panels during erection,” he says. “Handling and shipping the big, arched panels required special attention as well.”

Hebert says that all the coordination and testing paid off. “The experience was fantastic,” Hebert says. “The panels went up almost flawlessly.”

—William Atkinson 



St. George Catholic Church in Baton Rouge, La., used load-bearing precast concrete panels from Gate Precast to eliminate much of the steel specified in the original design. Courtesy of www.toddlandryphotography.com.