

## Tindall's T-SLAB debuts in apartment complex

The Icon in Richmond, Va., is a 163,000 ft<sup>2</sup> (49,700 m<sup>2</sup>), 12-story apartment complex with 189 units. When SWA Construction, a developer in Richmond, acquired the property, the mission was simple: find the right building solution for the project.

Having just completed several precast concrete parking decks with Tindall Building Systems of Petersburg, Va., SWA opted to work with Tindall to design, manufacture, and erect this multifamily residence.

The owner/developer was also the architect on the project, so it was all in-house. "We had built two parking garages with the company, and they loved the look and quality of the concrete and were blown away with the speed of construction," says Chris Andrews, sales manager for Tindall's Virginia Division. The project gave Tindall an opportunity to use its new Tindall Lightweight All-Purpose Beam (T-SLAB) for the first time. "Coincidentally, we were in the midst of bringing T-SLAB to the public, and they asked if we could build their 12-story apartment out of precast. Of course we said, 'Absolutely!'" Prior to that, SWA had been looking at more conventional systems, such as cast-in-place concrete and steel.

"T-SLAB essentially allows us to provide a cost-effective shallow slab member with relatively longer spans than other similar slabs," Andrews says. "It also allows for unique geometries, cast-in items, and great fire and acoustical ratings."

To produce T-SLAB, Tindall creates a series of super lightweight concrete blocks known as ribs. These arch-shaped blocks are formed by a lightweight aggregate casting (LAC) machine, which serves as a three-dimensional printer for concrete. Blocks are placed where needed or left out to accommodate various design elements, such as floor drains, electric conduits and boxes, solid zones, and large openings. These concrete blocks serve as the core of the T-SLAB and provide a grid for prestressed and nonprestressed reinforcement.

Next, the team encases the core in high-strength, self-consolidating concrete. This creates a series of arches inside the T-SLAB, facilitating load distribution across the entire width of the beam. Once cured, this two-step process results in a stronger, lighter precast concrete slab system that supports the project's need for design flexibility, durability, and speed.

As is typical in a constricted metropolitan location, jobsite challenges included everyday traffic and congestion. Further, the team was on a tight deadline and required a solution that provided accelerated all-weather construction. After a



The Icon in Richmond, Va., is one of the first structures to use the new Tindall Lightweight All-Purpose Beam (T-SLAB). Courtesy of Tindall.



Because of the tight construction area bordered by a parking structure and adjacent to a hotel, the crane was set in the middle of the three buildings, including The Icon. Courtesy of Tindall.



**Erection of The Icon begins with Tindall Building System's T-SLAB shallow slab member. T-SLAB has spans that are relatively longer than other similar slab systems and allows for unique geometries, cast-in items, and high fire-resistance and acoustic ratings. Courtesy of Tindall.**

thorough review of building material and enclosure options, a total-precast concrete structure provided the best solution versus steel or cast-in-place concrete with alternative cladding.

Tindall worked seamlessly with SWA Construction's architects to lay out a plan, time line, and model for a total-precast concrete solution using the T-SLAB system. In fact, this project was the first of its kind to employ T-SLAB in the United States, pioneering the way for multistory, multifamily total-precast concrete structures.

The team erected The Icon in just under 16 weeks. After the initial start-up, the crew accelerated its pace, completing an entire level per week. Finishing the structure on time allowed other trades into the building sooner to complete interior buildout, streamlining overall construction to create a path to faster tenant occupancy and revenue generation for SWA.

In terms of addressing design challenges, there was a lot of back and forth and a collaborative team effort between

Tindall and SWA, Andrews says. The main design items involved determining shear paths due to lateral loads, figuring out structural sections of exterior panels (which were insulated, load bearing, and had large window openings), and coordinating penetrations required through the slabs while avoiding main reinforcing sections.

In terms of production challenges, the exterior walls were relatively long, fully insulated, heavily reinforced, with large openings and an architectural face. "This was a challenge in forming and reinforcing while maintaining 24-hour pour cycles to meet an aggressive delivery schedule," Andrews says.

Delivery to and erection of the project, which is located in a tight city area, required careful planning. "We had to coordinate lane closures and staging with the City of Richmond to get trucks into the jobsite and to the crane while erecting next to an existing building," Andrews says. The structure was erected adjacent to a hotel and about 50 ft from a parking structure, which Tindall had built a few months earlier.

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