

A Magazine for Specifiers and Engineers

precast solutions

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ARCH KEEPS TRAINS RUNNING

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construction-site problem

Inside: Westin Hotel
and Residences, Virginia Beach
Town Center, Virginia Beach, Va;
Tallest Building in the State of Virginia;
SlenderWall Manufactured & Installed
by Smith-Midland® Corporation,
Midland, VA

A TOWERING PROJECT IN PRECAST

PROJECT PROFILE

Project: Westin Hotel and Residences, Virginia Beach Town Center, Virginia Beach, Va.

Project Owner: Armada Hoffer, Virginia Beach, Va.

Executive Architect: Brennan Beer Gorman Architects, Washington, D.C.

Precast Manufacturer: Smith-Midland Corp., Midland, Va.

Builder: Armada Hoffer Construction, Virginia Beach, Va.



WHEN BUILDERS AND ARCHITECTS STARTED PLANNING VIRGINIA'S TALLEST STRUCTURE, THEY DIDN'T WANT TO TAKE ANY CHANCES WHEN IT CAME TO STRENGTH AND DURABILITY. A LIGHTWEIGHT PRECAST PANEL SYSTEM OFFERED THE SOLUTION.

BY DEBORAH HUSO

Virginia Beach has always been known for its high-priced real estate, and that real estate just got a little pricier with the completion of the Westin Hotel and Residences at Town Center, the city's "new" downtown about 10 miles from the oceanfront. The 38-story structure now ranks as Virginia's



tallest, and its penthouse condos have sold for as much as \$4 million each, ocean views included. The new condo owners will also be paying the highest tax rates in Virginia Beach.

But those owners consider the price well worth it to live in what has instantly become the city's most coveted real estate. And that real estate owes a lot of its value to the strength of precast concrete, which makes up the vast majority of the 900,000-square-foot building's façade.

LIGHTWEIGHT ARCHITECTURAL PRECAST MAKES THE GRADE

The Westin project, which began in 2006, has a structure of cast-in-place concrete with a structural precast garage. The lower four stories of the building's imposing tower are brick in keeping with the surrounding architecture, but the rest of the Westin's exterior actually sports more than 77,000 square feet of an innovative, lightweight architectural precast panels known as SlenderWall. Most of the structures in Virginia Beach's



Photo by Fred Figalli

► The interior 8-inch-thick precast panels offer sound control without the need for layers of expensive gypsum board. The interior auditorium demising walls achieve a sound transmission coefficient (STC) greater than 65.



Courtesy Smith-Midland Corp.

Town Center are clad in some type of precast concrete or brick.

The panel system consists of a lightweight architectural precast concrete, hot-dipped galvanized welded wire for strength, insulated Nelson anchors for attachment, and galvanized or stainless steel studs on the interior side.

Architects originally intended for the Westin's exterior to be made of an Exterior Insulating Finishing System (EIFS), but the building's contractor and owner, Armada Hoffler, decided on a tougher system that would stand up to severe weather and the test of time.

Ashley Smith, president and chief operating officer of Smith-Midland Corp., the precast provider on the Westin project, suggested the lightweight precast panels, as he knew they would allow for a direct swap of materials from EIFS without the need for additional structure.

One of the major attributes that made the panels attractive to Armada Hoffler was its light weight. The product weighs about 30 pounds per square foot. In addition, the panels are only 2 inches thick.

Traditional materials would have been much heavier than the panels, says Bahram Kamali, project architect and partner with Brennan Beer Gorman Architects, Washington, D.C. The lightweight precast panels meant they could be larger, as much as 35 feet tall by 14 feet wide, reducing the number of lifts for the crane as well as allowing greater speed in enclosing the structure and making it weather-tight, as obviously there were fewer joints to seal. The panels were installed vertically with each one covering three stories of the building.

Smith-Midland Corp. developed a special connection system for the Westin project that allowed the weight of the panels to distribute evenly across the three floors to avoid adding extra steel to the building's frame to support the panels' weight. Had traditional materials been used, the builder would have had to add concrete beams around the structure's perimeter



Photo by Fred Figall

to support the weight. This would have meant additional cost for Armada Hoffler.

"Using heavy (materials) in a beach area would have added 45 pounds per square foot to the project," Smith explains. "That means more than 3 million pounds of additional weight on the building." It also would have meant driving more pilings into Virginia Beach's poor, sandy soil to support the structure. As constructed, the building already rests on prestressed concrete piles driven 60 feet into the ground. More weight on the building would have meant more and deeper pilings.

The lightweight panels also offered additional structure protection in the event of high winds associated with hurricanes. Because the panels are attached using anchors and are not welded to the building's frame, the panels can move independently of the frame during times of severe wind loading and seismic shock. "This reduces wind load on the structure," says Smith. "There is independent movement of precast from the frame and structure of the building."

Armada Hoffler and Smith-Midland tested the panels' ability to bear the high winds Virginia Beach frequently experiences during hurricane events. The panels performed successfully in winds up to 169 miles per hour, the speed at which testing stopped. "Those panels passed with flying colors," says Smith.

FEWER PANELS MEANS FASTER CONSTRUCTION

The lightweight panels also allowed for lower transportation costs to the building site. "The panels were shipped on flatbed trucks," explains James McRoberts, Armada Hoffler's senior project manager. "There was one panel per truck, and the largest panel was 400 square feet," he says. Once on site, the panels went up pretty quickly.

"We were on a fast-track schedule," notes Smith. "The contractor wanted the panels to get installed about 10 to 12 floors behind the framing of the building." This meant the builder was creating the frame for upper level floors while panels were being installed on lower floors. Because both processes required the use of a tower crane, builders worked on the frame during the day and then used the crane to attach panels at night. With round-the-clock construction, the 525 precast panels were

◀ The panels were installed vertically with each one covering three stories of the building.



Courtesy Smith-Midland Corp.

◀ The 525 lightweight precast panels were installed in just over three months.

installed on site in just over three months after only five months of production time in the factory. McRoberts feels the panels went up quickly, especially considering the fact that progress was often sidelined by weather. "You can't install a three-story concrete panel in high winds," he points out.

The inside surface of the panels consists of 16 gauge, 6-inch galvanized steel studs vertically spaced at 2-foot centers. This provided for easier and faster construction since the panels' metal framing can be used for mounting interior gypsum board with no additional metal studs required.

The precast panels are also virtually maintenance-free, no small consideration in a building that is 38 stories tall. Kamali says the Westin was his first experience with the panel system. "I think it's a good product, and it's cheaper than traditional (materials)," he says. "And you can have any shape and texture you want."

QUALITY CONTROL

One of Kamali's biggest concerns with the lightweight panel system was the waterproofing of the project's façade. "The watertightness relies heavily on how well the sealant is installed and how durable it is," notes Kamali. "The standard method of double-caulking a joint (with two standard backer rods) cannot be used, because the panel is too thin." Kamali says Smith-Midland Corp.

addressed this concern by providing a unique double caulk system with a thin backer-rod material.

Chipping, cracking and warping are other concerns that give rise to architect and contractor anxiety, but strict quality control during every step of the manufacturing and delivery processes helps to allay these concerns.

Another challenge is the color matching of the panels. In the case of the Westin tower, the panels feature two tones: a light acid wash and dark brown accents for trim around the window punches. The controlled environment inherent with precast concrete provides consistent results with each cycle of the manufacturing process. "To have the right architectural effect, the colors have to be correct," notes Kamali.

The Westin, which opened for business last November, includes 236 luxury guest rooms, more than 100 condominium units, heated indoor pool, fitness center, restaurant, more than 35,000 square feet of retail space and a 947-space parking garage.

"SlenderWall was the right solution for us," says Lou Haddad, Armada Hoffler's president and CEO. "This is the tallest building in Virginia, so we didn't want to experiment." **PS**

Deborah Huso is a freelance writer who covers home design and restoration, sustainable building and design, and home construction.

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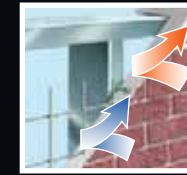
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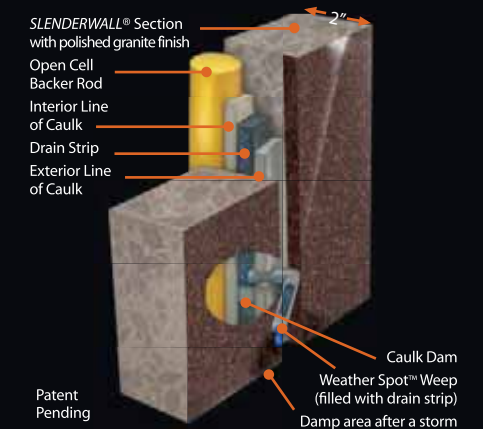


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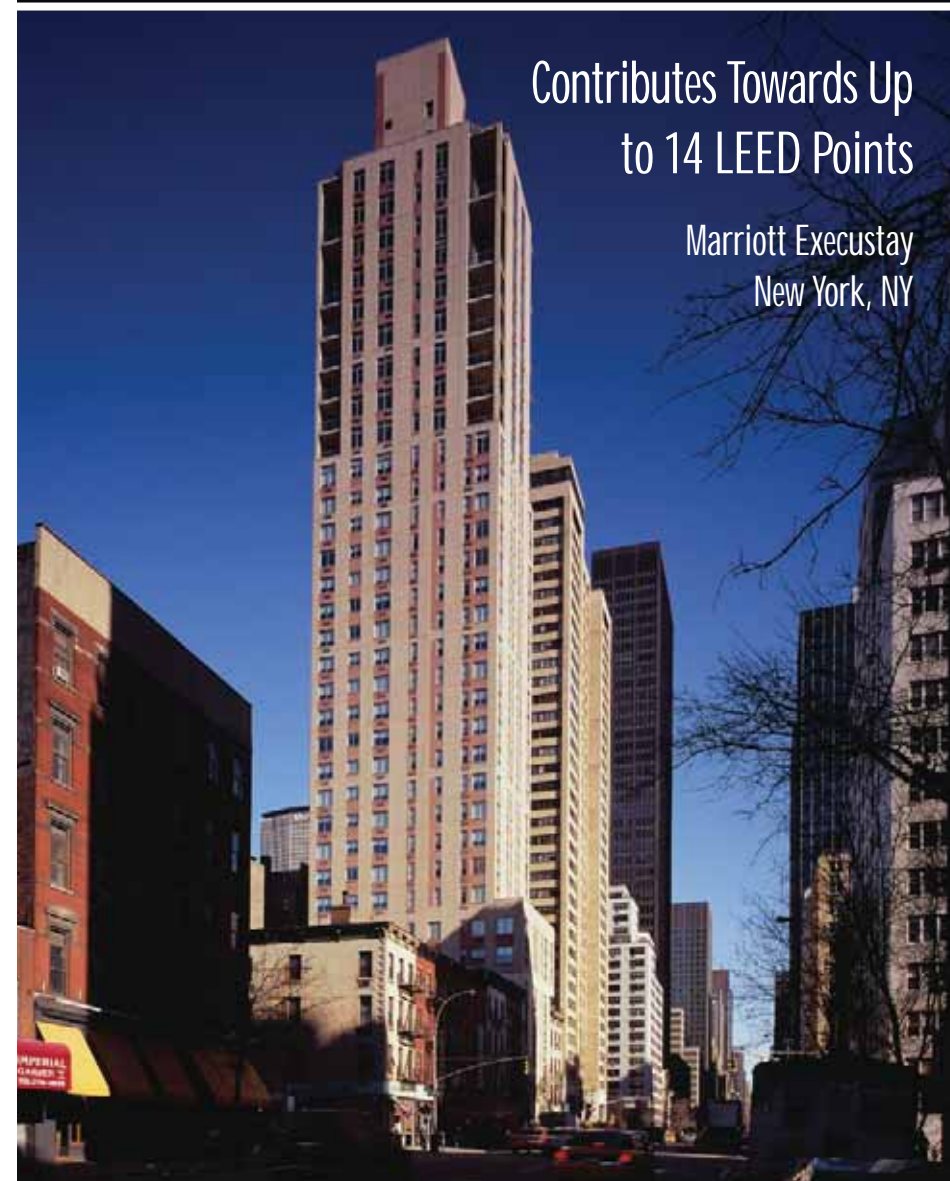
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