

Precast's Advantages Register With Hotel/Motel Designers

Precast offers the hospitality industry a host of advantages, including fire resistance, sound attenuation and cost-effective construction

Although the rise of dot-com companies and video conferencing make it seem as if more business today can be done from home, the truth is that more people are on the go than ever before, say industry observers. Computers have helped open the door to small entrepreneurs going out on their own, creating new businesses that must meet with customers and investors. And competitive airline costs are encouraging more people to attend conferences, meet face-to-face and get away from it all. The result is a need for more lodging facilities across the nation.

"The hotel and motel markets have experienced significant growth over the past few years, and precast concrete is helping to meet that growing need as a structural and architectural solution of choice," says Bob McCormack, executive vice president of Spancrete Industries Inc. in Waukesha, Wis., and leader of PCI's Hotel/Motel market team. The reasons owners and designers are turning to precast concrete components are varied, depending on each individual situation, he notes. But the trend is apparent.

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"Precast offers benefits related to the transmission of sound and fire resistance through the compartmentalization of units. It also is cost effective, facilitating



An all-precast building shell was specified for the Double Tree Hotel, Rosemont, Ill., because it is located in proximity to Chicago's O'Hare International Airport and precast is most effective in reducing sound transmission. The finish on the architectural precast wall panels features an exposed sandblasted aggregate on the lower floors of the 10-story building and a smooth finish with horizontal reveals above.
Photo: Anthony Rossi

speedy construction. It is a durable and maintenance-free material. Owners of mid-rise and high-rise hotels look at precast as a solution because of all these benefits."

Hollowcore Offers Benefits

Precast concrete hollowcore slabs are a growing choice among designers for use as hotel/motel floors and roofs, he says. Many hotels in Las Vegas, for example, are using 8-foot-wide hollowcore slabs for their flooring units to provide high fire resistance and acoustic control.

Hollowcore offers a flexible product and can be cast to meet the specific needs of the project, with thicknesses ranging from six inches to 15 inches for high loads.

Precast components also are used frequently for stairs, walls and elevator shafts. In some cases the hotel features an all-precast structure along with architectural precast panels that allow the new facility to fit in seamlessly with other buildings in the neighborhood. Load-bearing panels also are popular, as they allow for a reduction in structural

materials and can be erected quickly. This is important both in urban areas, where brick may dominate, and in suburban areas, where the panels can be textured or designed to visually reduce their mass and fit in with other corporate structures.

Precast Aids Four-Star Hotel

An example of the benefits provided by load-bearing precast concrete wall panels can be seen in the recently completed Double Tree Hotel in Rosemont, Ill. Located near Chicago's O'Hare International Airport, the 287,000-square-foot, 369-room hotel is rated as a four-star hotel — one where creating a sound barrier to the planes flying overhead was of paramount importance. Architect Anthony Rossi of Addison, Ill., knew he needed the advantages that precast concrete offers to achieve the Sound Transmission Class ratings he desired.

He specified load-bearing precast concrete panels, a hollowcore floor and roof system, double tees around the pool, shear walls for stability and precast elevator shafts and stair wells for the 10-story structure. Rossi also specified the use of precast shear walls. Using double layers of gypsum board and steel studs between guest rooms achieved an STC rating of 50.

"The use of an all-precast structure definitely accelerated the construction process, since all the components could be produced off-site," he says. "In fact, construction would have been extremely difficult and almost impossible without precast components because of the constraints of the extremely tight site surrounded by heavy traffic."

The U-shaped hotel has only 20-foot setbacks on three sides. Thus the crane could erect only from one side and the middle of the hotel's three wings. Complicating the crane work was the fact that the Federal Aviation Administration officials had to approve the crane's height due to the hotel's proximity to the airport. "They monitored us," Rossi says. "The building is 130 feet high, and the crane could only go up 30 feet higher or it would show up on radar."

Rossi and the precaster, J.W. Peters & Sons Inc. in Burlington, Wis., had additional logistic challenges. The hotel is located directly across the street from the O'Hare Exhibition Center, which generates heavy traffic. "Close monitoring of construction trucks was necessary



A modular precast structural system, known as the Dyna-Frame system, expedited a difficult construction schedule on the Breakers Tower, an addition to Hotel Breakers at Cedar Point Amusement Park in Sandusky, Ohio. The precast framing system also provided excellent fire resistance, plus sound and thermal insulation. Photo: Davidson, Smith, Certo Architects

since we couldn't interfere with exhibition traffic," Rossi says. "We received phenomenal cooperation from the precasters in making deliveries flow smoothly."

To give the high-end hotel an aesthetically pleasing façade, Rossi specified two architectural finishes for the panels: exposed sandblasted limestone aggregate for the bottom 35 feet and a smooth form finish with a horizontal reveal pattern on the upper floors. The aggregate finish on the bottom levels is echoed with a 10-foot-wide aggregate band higher up on the building. "The reveals on the smooth panels had very tight tolerances, and it was difficult to line them up correctly," says precast representative Bill Hubbard. "Casting took special care, and the pieces worked quite well."

The precaster, which also served as the engineer for the precast work, produced and erected 3,548 precast elements, including 2,920 pieces of hollowcore slabs. Other precast components included special double tees and beams to frame the pool area and a walkway connecting to an existing parking structure. "The logistics were the major challenge on the job," says Hubbard.

System Speeds Hotel Addition

The Breakers Tower in Sandusky, Ohio, benefited from a different type of precast structural system. Completed in 1999, the 10-story, 170,000-square-foot hotel is one of three hotels accommodating guests at Cedar Point amusement park and resort. The new 230-room Breakers Tower replaces an older wing of the hotel, which was demolished

before construction began. It expands and enhances the available facilities, which were needed for the growing number of visitors to this popular resort on the shore of Lake Erie.

The new construction is located between two wings of the existing historic hotel and was built using a precast structural system known as the Dyna-Frame system. Produced by Flexicore Systems Inc. of Huber Heights, Ohio, the packaged precast design includes columns, beams and hollowcore components.

"Probably the most difficult aspect of constructing the addition was its location and the time constraints," says Monty Jasper, vice president of maintenance and new construction for Cedar Point. "The site is difficult to access, and we specified that construction could take place only during October through May, when the park is closed."

After reviewing a number of alternatives, project designers and engineers from Cedar Point selected the Dyna-Frame system. "This structural system with the hollowcore decks appealed to us for a number of reasons," says Jasper. "We liked its modular flexibility. The system goes together like an erector set, allowing us to design and build to our specific needs. It is also extremely strong and versatile and is cost-competitive because it has the significant advantage of going up very quickly and not being affected by cold weather."

The precast system offers additional inherent advantages, too. The material's dense, noncombustible composition provides a structure that is more fire-resistant than steel framing, with superior sound and thermal insulation attri-

butes. Precast also minimizes disruption to the construction site because it can be factory-cast, opening up the site. The Dyna-Frame system provided almost immediate access for other construction trades, who essentially followed one floor behind as the precasters' erection crew completed each level of framing.

"The precast system was a great solution," says Jeff Certo, principal of Davidson, Smith, Certo Architects in Westlake, Ohio, who served as design architect for the project. "Due to its acoustic and fire-resistive performance, hollowcore is a great material for our hotel projects."

Flexicore Systems supplied 500 columns, 12,500 lineal feet of beam, 150,000 square feet of deck, 46 stair and landing units, 69 precast walls for elevator shafts and stair wells, and 20 balconies. Good April weather gave the precasters a three-week head start on their construction schedule that had not been planned, allowing the crews to frame three stories before shutting down for the season. After a summer hiatus, construction restarted in October, and erection of the building frame was completed within 12 weeks.

Facilitating Construction Speed

Other hotel projects also have benefited in different ways from the use of precast hollowcore and precast structural systems. For instance, the five-story, 53,000-square-foot Hampton Inn in



The five-story Hampton Inn in Niagara Falls, N.Y. was constructed during the winter, and the use of precast helped make this schedule possible. The precasters erected the all-precast structure, including load-bearing wall panels, in just five weeks.

Niagara Falls, N.Y., was built in seven months, partially during the winter — an undertaking that would not have been possible without installing hollowcore slabs and structural load-bearing wall panels. Seven box units were used for elevator cores and six panels were required to frame in the pool area.

"We specified precast because the owners wanted speedy construction and an excellent fire rating," says architect William Henderson, principal of his namesake firm in Clarence, N.Y. "The building is literally fire proof." The precast walls and floors also lessened sound transmission. Each 12' 6" guest-room module had one ready-to-finish precast wall panel, with electrical outlets cast into the panels. Oldcastle Precast Co. in Manchester, N.Y., produced 110 pieces totaling 53,000 square feet of

hollowcore slabs, 6-inch-thick load-bearing wall panels and 12 precast stairs and landings for the project. It took the precaster only five weeks to erect the five floors.

Timely Hotel Opening

The use of hollowcore slabs for flooring/ceiling units on the four-story Hilton Garden Inn in Green Bay, Wis., expedited construction, thereby resulting in savings for the owner. "It was the first project for Hilton that we have ever completed on time," says architect David Kendzierski of TDI Associates, Pewaukee, Wis. The hotel was finished within eight months.

"The hollowcore gave us the fire ratings and sound control we needed without requiring any additional materials," Kendzierski adds. It also allowed long, clear spans, which were desired by the owner and architect to create an open look. Approximately 52,000 square feet of 4-foot-wide by 8-inch-thick precast concrete plank was supplied by Spancrete Industries in Waukesha, Wis., who erected the decks within three months.

These hotels are only samples of the ways precast concrete components are being used to provide significant advantages for owners and designers throughout the world. Whether the driving forces are tight sites, economy, bad weather or speedy erection, precast components can meet the logistical needs while providing strong fire resistance, sound control and durability. ■

— Anne Patterson

Precast Offers ACOUSTICAL CONTROL

A recent study reported by the Masonry Construction Advisory Committee of Illinois presents data showing the effectiveness of masonry walls and hollowcore slabs as a sound barrier. Precast concrete and concrete masonry units, along with proven capabilities for keeping fire from traveling from one room to another, cannot be matched by other materials as a sound barrier between rooms, according to the study.

"With attention to the surface finish of concrete masonry walls, the walls will absorb almost as much of the sound that strikes them as acoustical tile — 40 to 50 percent," the study found. "The heavy mass of the concrete wall provides excellent performance as noise insulation against transmitted sound."

Sound Transmission Class (STC) is a single-figure rating derived in a prescribed manner from sound transmission loss values. The rating provides an estimate of a partition's performance in typical sound-insulating situations. The performance of single-wythe concrete walls uniformly results in high STC ratings, the study says.

The model building codes have provided minimum recommended allowable sound transmission limitations for partitions that separate adjacent units in multifamily dwellings and similar partitions that separate living space from public and private areas. An STC rating of 50, such as that achieved between rooms at the Double Tree Hotel in Rosemont, Ill. with the use of precast concrete walls, is above the BOCA requirements of 45.