

Precast Concrete Offers 'Better Way To Skin Cat'



Switch from masonry to precast concrete structural system for Detroit hotel creates flurry of activity but cuts erection time in half — opening the doors just in time

Looking for “a better way to skin a cat,” the contractor hired to build the new Hilton Garden Inn in downtown Detroit decided to make some last-minute changes to the construction plan. In order to speed completion time, he replaced the concrete block in the original structural-system plan with precast, prestressed concrete components. The result was a two-month time savings.

Plans for the 10-story structure had called for block-and-plank construction, using reinforced masonry walls with precast plank floors. “We originally planned to build with concrete block, but after doing two dormitories for Wayne State University in Detroit, we decided there had to be a better way to skin this cat,” says Greg Mersch, project executive for Turner Construction Co. of Detroit. “Those jobs took forever, waiting for the masons.”

Hilton officials had a tight timetable for opening the project so it could begin generating revenue, so the design was changed to an all-precast structure for the walls, as well as for the floor planks. The switch to precast for the load-bearing walls, cut the erection time in half, from four months to only two months, Mersch says.

Major Time Savings

The cost for the precast components compared to block was about the same, Mersch adds, but the saving in time was noteworthy. The hotel opened its doors on March 5, and the next day delegates to the Society of Automotive Engineers (SAE) convention checked in. Needless



Detroit's Hilton Hotel switched to precast concrete after earlier projects with masonry structures moved slowly.



to say, they had reserved their rooms well in advance, so the timing couldn't have been better — or closer.

The switch to precast brought a flurry of activity for the building's architect, Kraemer Design Group of Detroit. “We didn't have a whole lot of time to revise our drawings,” says Mark Mardirosian, a principal with Kraemer. “The changes were being done almost simultaneously with construction. It was a wild dash.”

The hotel's lower level houses a swimming pool and exercise area, four conference rooms, housekeeping facilities and mechanical equipment. The first floor has a reception desk,

lounge, board room, restaurant, kitchen and administrative offices. There are 22 rooms per floor, 2 through 10, including three suites.

Coordinated Changes

The architectural firm worked closely with the precast supplier, Kerkstra Precast Inc./Spancrete Great Lakes of Grand Rapids, Mich. “They provided shop drawings and we made the necessary alterations,” Mardirosian says. “We replaced 8-inch block with 8-inch precast, so the change didn't affect the overall size. We actually saved a few inches on the first floor, where 12-inch block had been specified.”

Kraemer Design's Bob Kraemer adds that his company “hadn't had a lot of experience with precast up to this project, but after this experience, we're now looking at precast as the first solution for many newer projects.” The

‘We're now looking at precast as the first solution.’

company has another hotel on its books right now that will use the precast system, he says.

The precaster's project manager, Jude DeBacker, calls the change “a major feat, pretty remarkable considering the size of the project.” Kerkstra provided about 1,100 precast pieces, including the stairways and elevator shafts and 110,000 square feet of floor plank.



Fact Sheet

Project Name: Hilton Garden Inn
Type: Hotel
Location: Detroit
Owner: The Ferchill Group, Cleveland
Designer: Kraemer Design Group, Detroit
Contractor: Turner Construction Co., Detroit
Precaster: Kerkstra Precast Inc./Spancrete Great Lakes, Grand Rapids, Mich.
Size: 10 stories, 127,000 square feet
Precast Components: 1,100 precast pieces including walls, stairways and elevator shafts
Project Cost: \$14.5 million

The 10-story hotel features two elevator shafts constructed of precast "boxes," which were assembled off-site and lifted into place as one unit, reducing crane picks.



A 260-ton-capacity crane lifted the 52,000-pound precast "boxes" used for elevator shafts.

used for all of the precast erection. The boxes, weighing 52,000 pounds each, were placed one on top of the other and locked together with connection rebars and coil-rod inserts that fitted into tubes in the box below.

"The crane was able to make one



Each 28-foot section of precast concrete wall panel was set and anchored in about one hour.

"We took the masonry designs and converted them to precast," he says. "We generated shop drawings, worked with the architects and took the new designs through the approval process. We were fabricating precast pieces and getting them on-site within eight weeks." Orders began flowing in on January 20, 2003, and the precaster was in production by March 3.

Precast Elevator 'Boxes'

The building's two elevator shafts were constructed of precast "boxes," with all four sides assembled off-site, trucked to the project and installed by the 260-ton-capacity crane that was

pick per floor instead of the five that would have been necessary for each of the four sides of the shaft plus the divider wall," explains DeBacker. "The fewer picks you have, the lower the cost of construction." As to the precast stairways, which replaced steel, he says, "They allowed easy access into the building without having to build

temporary stairs. They provided a safe way for the tradesmen to come and go." The stairs were subcontracted to the C.J. Pink Co. of London, Ontario.

The hollowcore floor plank was manufactured 8 feet wide, reducing the number of plank joints and overall piece count. Exterior walls feature cast-in dovetail brick anchor slots to attach the face brick. Engineering for the precast design was subcontracted to Reigstad & Associates Inc. of Minneapolis.



Eight-foot-wide hollowcore planks were used as flooring on each level to reduce joints and picks.

Panels Set In One Hour

Each section of precast wall, 8 inches thick, 8 feet high and about 28 feet in



Construction crews coordinated with the precaster to saw-cut openings as needed on each level.

length, was set and anchored in about an hour, according to Mersch. “That size wall could take a whole day for masons to build. Precast certainly saved the day.”

Construction crews coordinated with precast engineers in order to saw-cut the floor plank for bathroom plumbing without compromising the reinforcing, he says. Furring was applied to interior walls to provide space for electrical wiring between the precast and drywall.

The building, a modified L shape, was constructed in two sections, with the first part rising from the cast-in-place foundation to the roof in phase

one. When that was completed, the crane was moved about 75 feet — its only move during construction — to accommodate phase two. As that work began, the carpenters, electricians, plumbers and finishers moved into the first half to complete their work.

Tight Site Posed Challenges

The hotel was a tight fit, nestled among other large structures in downtown Detroit. It is bounded by busy Gratiot Avenue on the south, an alley on the north and secondary streets east and west. “The real challenge came in erecting the precast,” says Mersch. The construction team rented the parking lot next door to set up the crane, as the alley would have been too tight a fit. The crane was walked from there to the building site for phase two.

Exterior walls of the hotel are brick over the precast with the exception of one wall, which is precast with a brick pattern stamped into it, Kerkstra’s DeBacker says. “During construction Turner really had only one major subcontractor — us — and there were no masons or steel erectors to get in the way,” he adds.

Mersch commented that Turner has completed other structural precast projects, as well as using architectural precast finishes for the exterior walls. “Precast provides speed of erection and offers an excellent quality product.” ■

— Donald P. Merwin



The hotel features a modified L shape and was constructed in two phases to allow interior crews to begin finishing one section quickly.



The site offered tight restraints, requiring the team to rent the adjacent parking lot to provide space for the crane during the erection process.



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