

# Precast Speeds Construction Of Qwest Center Omaha



*\$208-million convention center and arena adds to growing riverfront redevelopment, and precast concrete panels and risers help it meet budget and schedule*

In the short time since it opened, Omaha's new arena and convention center has not only become a centerpiece of the city's riverfront redevelopment, it's become a money-making facility faster than anticipated. Precast concrete's ability to help the facility open quickly and stay on its construction budget played a role in that success.

The Qwest Center Omaha facility, completed in 2003 at a cost of \$208 million, serves as a major component in the conversion of what once was a Union Pacific Railroad yard along the Missouri River. The total redevelopment along the riverfront, started in 1999, contains \$1.6 billion worth of new structures and infrastructure, including the 41-story First National Bank Tower, a Hilton hotel, a National Park Service building and a facility for the Gallup polling organization, plus upgrading of the Lewis & Clark Landing at the river.

The renewal also includes a portion of downtown Omaha, away from the riverfront.

### An Early Profit

In its first 10 months of operation, a period in which it was projected to lose more than \$2 million, the arena and convention center turned a profit of \$1.1 million, according to Christy Harris, senior vice president-

*'I would definitely say precast gave us a great savings in time.'*

administration of the Metropolitan Entertainment & Convention Authority (MECA). The facility, its naming rights won by a communications company, contains 1.1 million square feet of

exhibition and meeting space, as well as an arena. Infrastructure additions, such as streets, sewers and surface parking, brought the project's total cost to \$291 million.

The project was on a fast-track timeline to ensure the facility and its attached parking structure were up and running quickly. The architect and contractor immediately turned to precast concrete to help meet construction deadlines. Precast concrete insulated sandwich panels were used for the façade of the convention center and arena, while the arena's seating risers also were made of precast, prestressed concrete. The parking structure was designed as a total precast concrete structure and includes a landscaped garden on its roof.

"I feel that the Qwest Center Omaha is the crown jewel," says Robert Cernelic, a principal with the architectural firm DLR Group





## Fact Sheet

**Project:** Qwest Center Omaha

**Type:** Convention center, arena, parking structure

**Location:** Omaha, Neb.

**Architect:** DLR Group, Omaha, Neb.

**Precaster:** Rinker Materials (now a division of Coreslab Structures Inc.), LaPlatte, Neb.

**Owner:** City of Omaha; operated by Omaha Metropolitan Entertainment & Convention Authority, Omaha, Neb.

**Cost:** \$208 million

### Convention Center and Arena:

**Engineer:** Thornton-Tomasetti, New York City

**Contractor:** Kiewit Construction Company, Omaha, Neb.

**Size:** 1.1 million square feet

**Precast Cost:** \$5.8 million

**Precast Components:** five rectangular beams, 544 12-inch insulated panels, 170 15-inch insulated panels, 113 coping pieces, 267 6-inch architectural panels, 370 precast vomitory walls, 54 stairs, 180 Level 2 seat decks (11½ to 14 inches per tread), 52 Level 3 seat decks (16-inch tread), 40 Level 4 seat decks (19-inch tread), 264 Level 5 and 6 seat decks (21½- to 23-inch tread)

### Parking Structure:

**Engineer:** AGA Consulting Inc., Minneapolis

**Contractor:** Graham Penn-Co, Omaha, Neb.

**Size:** Three stories, 500 parking spaces

**Precast cost:** \$2.7 million

**Precast Components:** 182 12-foot by 28-inch double tees, 194 6'6" by 32-inch double tees (top level), 14 interior columns, 43 exterior columns, five tree columns (for stairs), 77 beams, 10 shear walls, 16 lite walls, 19 floor slabs, eight stairs, 122 spandrels

*Qwest Center Omaha's fast-track construction process was aided by the use of precast concrete insulated sandwich wall panels with detailed reveals. They provided both aesthetics and durability, and they helped enclose the building quickly.*

in Omaha, Neb., and the project manager. "Others may dispute that, but it certainly was a project that gave impetus to the riverfront development. It was a major contributing factor."

The project focused so intently on

meeting its deadline that "construction was started before all the architectural documents were completed," he says. "We gave them the foundation and piling documents while we were still putting together the structural steel

drawings." Meanwhile, precaster Rinker Materials Corp. (now a division of Coreslab Structures Inc.) in LaPlatte, Neb., won contracts totaling \$8.5 million to supply the precast and had begun manufacturing components.

“There were no problems from our side,” says Andy Newell, precast project manager for Rinker. “We were sitting and waiting for them.” Indeed, the precast components were credited with saving time and labor on the project, as well as providing durability and a uniform, pleasing exterior.

### Significant Time Savings

“I would definitely say precast gave us a great savings in time,” says Jim Francois, engineer for Kiewit Construction Co. in Omaha, Neb., the construction-management firm. “It’s aesthetically pleasing, and the architectural reveals are more precise than cast-in-place concrete could have provided because it’s manufactured in a controlled atmosphere with less room for human error.”

Construction of Qwest Center Omaha, a single structure housing both the arena and convention center, began in 2001 and was completed about 2½ years later. Precast concrete was the material of choice for key components right from the start. “The architects asked us what

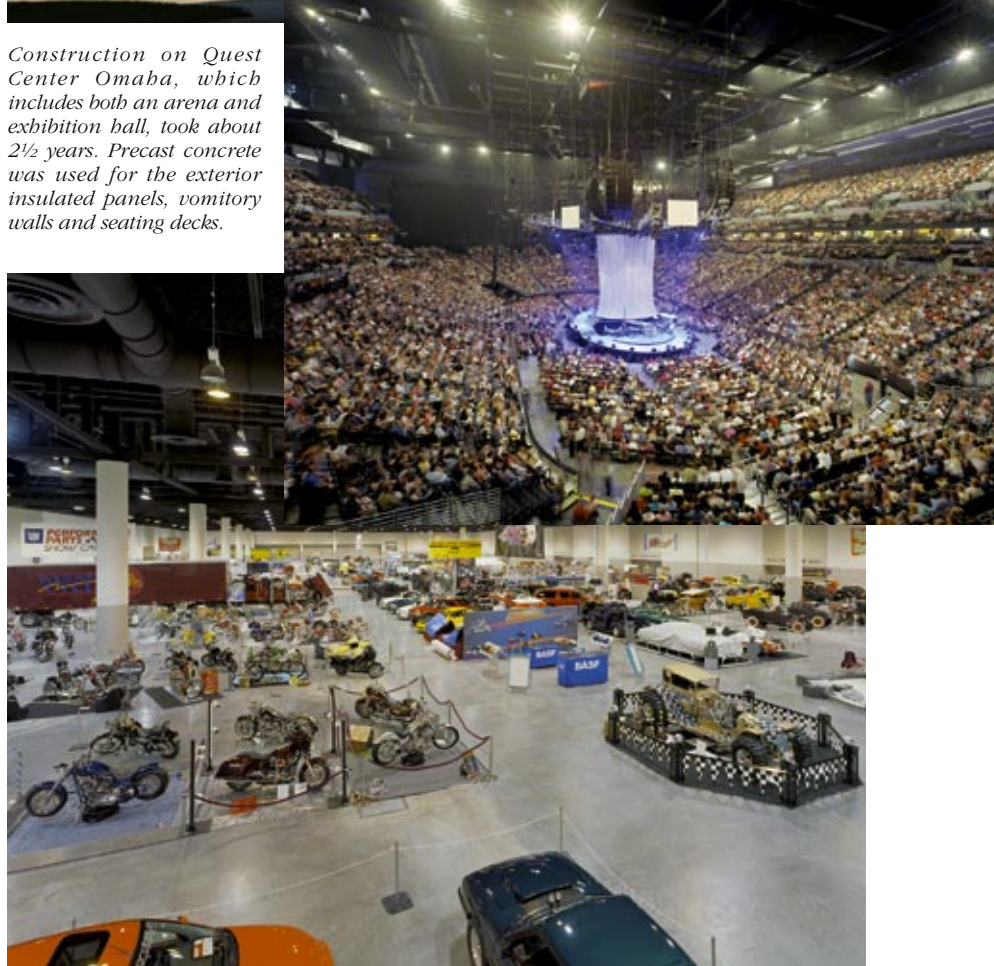
*‘Precast gave us the aesthetics we wanted and provided durability as well.’*

sort of look we wanted and called our attention to precast,” says MECA’s Harris. “Precast gave us the aesthetics we wanted and provided durability as well. It was the best way to get the building enclosed quickly. We didn’t have a lot of time, so we brought the precaster on board early to get the actual construction moving forward.”

Early involvement of the precaster was the key to reducing construction time, according to Rinker’s Newell. Rinker was involved early in the design phase with MECA, Kiewit and the architects and provided input to develop a functional precast system. In all, 2,667 precast, prestressed concrete components were cast for the combination of convention center, arena and parking structure. These included columns, beams, insulated wall panels, seat decks, stairs and architectural cladding. The insulated wall panels feature three inches of extruded polystyrene insulation with a 3-inch exterior wall. Some of the panels feature a 6-inch



*Construction on Quest Center Omaha, which includes both an arena and exhibition hall, took about 2½ years. Precast concrete was used for the exterior insulated panels, vomitory walls and seating decks.*



interior wythe, while others have a 9-inch interior wall.

The arena has six levels of seating, all featuring precast concrete risers. The treads range from 11½ to 14 inches high on level 2, progressing to 16 inches on level 3, 19 inches on level 4 and 21½ to 23 inches on levels 5 and 6.

### Few Problems Arise

“There were very few problems with installation,” says Kiewit engineer Francois. “We began construction without knowing the locations of the

embed plates, but that’s pretty typical on fast-track projects. The advantages that precast brought us in terms of procurement of material and installation schedule made it worthwhile. It definitely provided a savings in time compared to cast-in-place.”

Quality control and the finish “are so much better with precast,” agrees Anjana Kadakia, the engineer for arena construction for the engineering firm Thornton-Tomasetti of New York City. “All the pieces come out uniform.” Using precast saved in material, time and cost,



A total-precast concrete parking structure was erected adjacent to the convention center to hold 500 cars. The roof features a grassy, landscaped garden.

she adds. “It’s tedious to pour concrete [for seating tiers], so we wanted to use precast components. That’s a fairly standard approach today due to those benefits.”

### Parking Structure Connects

Although surface parking surrounding the facility can accommodate more than 4,000 cars, a four-level, 500-stall parking structure was built to the south and connected to the arena. The facility, with the three supported levels constructed with precast concrete components, sports a grassy landscaped plaza on its roof, a bit like an Easter bonnet. “I’ve never seen bushes and plants of that caliber on top of a building,” marvels Dave Rexin, project manager for the structure’s contractor, Graham Penn-Co of Omaha, Neb.

Tons of dirt, grass and a variety of plantings were put on the garage’s roof, which is used for entertaining or simply as a public gathering area. A pedestrian bridge over the railroad tracks to the east connects the roof garden plaza to the riverfront and a restaurant that faces the Missouri River. Another walkway leads south to the Old Market area. The structure also connects to the arena on all four levels.

Contractors weren’t able to start construction on the parking structure until the huge cranes that were used in building the arena were removed, explains Rexin. Erection began after the cast-in-place foundations were installed, and the erection took about three months. That was followed by about two months of additional structural work prior to opening. “If it wasn’t for precast, the schedule never could have been met.”

### Building Time Halved

The contractor set an average of 20 pieces of precast per day from March to June, reaching as many as 30 pieces on some days. This reduced construction time to “about half” of what would have been needed for cast-in-place concrete, according to Rexin.

“With cast-in-place, you average about one pour per week,” he explains. “That’s equal to about 20 to 25 pieces of precast. We were doing that in a single day.”

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could have been met.’*

The precast components were transported to the job site by truck, under certain restrictions. The double tees were 60 feet long and up to 12 feet wide, requiring deliveries to avoid rush-hour timing. “We made sure we got everything we needed on the job during the rest of the day.”

Economics were “the main reason we went with precast,” says Bill Gmitterko, president of AGA Consulting Inc. in Minneapolis, the parking structure’s engineer. “We looked at both cast-in-place and precast and selected precast to stay within budget.” The roof posed a key challenge due to the weight of the dirt and the planters that were used. The roof is supported by massive double tees topped by 3 inches of cast-in-place concrete.

The finished project has proved to be a multifunctional facility for the 800,000 residents of the Omaha metropolitan area. It holds events for everything from

conventions, large banquets and weddings to sporting events, family shows and live entertainment. The convention center houses more than 194,000 square feet of exhibit space, a 30,000-square-foot ballroom, and meeting space that can be divided into as many as 16 rooms. The arena, with maximum seating for 17,000, is home to the Creighton University men’s basketball team, the University of Nebraska at Omaha hockey team and the Omaha Beef of the National Indoor Football League.

Prior to construction, Omaha voters approved a \$198-million bond issue, to be repaid through parking fees, tax revenues generated by out-of-town visitors and a seat tax. “More than 60 percent of the voters approved the bond issue, and since we’ve been open, the community’s acceptance has been overwhelming,” says Harris, the MECA executive. “It has brought a large increase in the number of people enjoying the historical downtown area.”

The Qwest Center Omaha joins several other significant facilities in the downtown area that could be considered crown jewels for the city. “We have the First National Bank Tower, Gallup Campus, Union Pacific’s new headquarters, the Lewis & Clark Landing, the Holland Performing Arts Center opening this fall — so many that we can’t really call any one of them a crown jewel,” she says. Certainly, the Qwest Center Omaha facility certainly doesn’t pale in comparison to the other buildings and provides a high-traffic, high-energy component to the riverfront that will serve the community for many years to come. ■

— Donald P. Merwin



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