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fall 19

# **How Precast Builds - With Efficiency**



**EFFICIENT PRODUCTION.** The ability to manufacture precast concrete components year-round in all weather conditions both increases speed at the site and makes efficient use of plant/labor personnel.

**EFFICIENT CONSTRUCTION.** During the construction phase, the speed of precast concrete installation is unrivaled. The just-in-time delivery of pieces to the jobsite makes effective use of transportation and site access. A small crew can erect thousands of square feet per day and enclose the structure in days or weeks. Precast concrete construction is the most capable of meeting tight deadlines and enabling finishing trades to jump-start their work.

**EFFICIENT BUILDING/OPERATIONS.** Precast concrete wall panels provide a moisture barrier, fire resistance, sound-deadening properties, and insulation. It is an all-in-one component without the need for extra materials and applications.

## **Hilton Des Moines Downtown**

The exterior envelope on this 330,000 square foot full-service convention center hotel is a 10" thick insulated concrete wall panel system that includes 3" of integral continuous insulation. The composite wall panel system utilizes the Carbon Fiber Shear Grid connector system. The 786 pieces of precast concrete are supported from the cast-in-place concrete structure and post tensioned slabs. The three integral colors (White, Grey, and Charcoal), were selected with an acid etch finish exposing similar fine aggregates to create a consistent appearance throughout the exterior.

Enterprise Precast Concrete collaborated closely with the design team, contractors, and trade partners to produce a costefficient design with panel layout optimization, efficient load paths, detail assistance, as well as overall envelope coordination.

The contractor, reflecting on the project, noted that: "The precast is what really helped us flip the schedule. We essentially set the building out with two cranes in three weeks. This took us from building the structure to setting bathroom pods in eight weeks. Thus, the building was finished ahead of schedule and the owners took occupancy 30 days sooner than planned,



enabling more time to hire and train employees in addition to receiving, placing, and testing operating equipment."

#### **Project and Precast Concrete Scope**

- 8-Stories
- 786 Pieces
- 70,000 Square Feet of High Performance Wall Panels

#### Architect: DLR Group

WWW.enterpriseprecast.com

Architect of Record: **RDG Planning and Design** Engineer: **Raker Roads Engineering** Contractor: **The Weitz Company** Owner: **Polk County** Precast Specialty Engineer: **Enterprise Precast Concrete** Owner's Representative: **Project Management Consultants, LLC** Photo Credits: Jacia Phillips – Arch KC Photo Location: **Des Moines, IA** 





## **Pioneer Hall – University of Minnesota**

With the completion of this student housing renovation project, the number of beds increased from 693 on four floors to 756 beds on five floors. The dining hall expanded from 285 seats to 850 seats, large enough to accommodate all 2,900 Pioneer Hall residents. The building will include community and recreational spaces as well as office and support spaces within a 252,391-square-foot area, more than 40 percent larger than its original size.

More than 55,000 square feet of precast concrete was produced and erected for this project, including 280 members of 12-inch insulated cladding members. Wells Concrete also worked on the entryway renovations on the west and east sides of the building, and in addition to the architectural wall panels, hollowcore, solid slabs, double tees, and beams were used to create the floor and roof of a loading dock area.

The majority of the precast work was done in the expansion of the south and north courtyards, with a great deal of ingenuity put into producing the architectural precast panels to coexist with the historical aspects of the building. The precast panels were erected in the expansion of the south and north courtyards, with careful attention paid to the inset brick to complement, but not exactly duplicate, the original look. Smoothly finished, buff-colored end pieces separate



the existing building and the new panels, helping to make the transition less jarring. Each of the panels has two windows with architectural precast frames that were made from a 3D printed mold and an intricate cornice, all surrounded by cast-in brick.

The footprint of the building was expanded in both the North and the South Courtyard. The new precast walls met the existing masonry walls at eight different locations. The challenge of matching the new precast to the existing masonry was solved by creating a vertical architectural element that represented the look of the downspouts on the original building. The challenge of matching the existing brick was met using an Endicott thin brick with a 3-brick blend in a Flemish bond pattern.

3D printing wasn't the only unique 3D tool used on this project. The architect and contractor used laser scanning technology, like what was done on the Notre Dame Cathedral before it burned and will be used to rebuild it, to get a 3D model of smart data points of the existing structure and shared this model with Wells Concrete so they could import it into their system and establish accurate field condition joints where the new building met the old.

Contractor: McGough Construction Architec and Engineer: TKDA Owner: MN State Colleges and Universities Location: Minneapolis, MN





## **Prime Therapeutics – Boulder Lakes Office**

Prime Therapeutics is a headquarters campus for 2,000 occupants. With employee well-being at the heart of the design, the interior environment is light-filled and flexible with open stairways to promote internal mobility and collaboration.

Respecting the project budget, the exterior is precast concrete and glass. The aesthetic of the precast is elevated by horizontal banding (acid etch finish), vertical accent fins (polished face), color variation, and textural differences. A timeless architecture is achieved through only two exterior materials: precast concrete and glass, simply detailed and beautifully crafted.

Nearly 70,000 square feet of both black and white insulated precast concrete spandrels with an acid etch and polished finishes were used on the exterior façade. The precast producer was involved in an extensive collaborative effort with HGA in designing the structural systems to support precast.

The project designer sums up this project and its use of precast well, "The combined characteristics of prefabrication, design flexibility, and price point made the use of



precast concrete cladding an optimal choice for the project. The slender, ivory colored, horizontal spandrel elements give the building a visual lightness. A vertical precast concrete fin, featuring a polished front edge, punctuates the building facades at 15' on center. Projecting beyond the spandrel units, the fins cast shadows that change throughout the day and animate the façade. Using dark integral color precast panels at the building base helps to ground the building and suggest a change in material while gaining the economies of using precast as the primary exterior material."

To accommodate the aggressive project schedule, an intense coordination effort between the design team, engineer of record, steel fabricator, precast supplier and specialty engineer was undertaken. To speed fabrication and erection, all precast cladding supports were designed and detailed to be shop-fabricated as part of the structural steel building frame. This required close coordination between all team members to ensure critical design information was communicated and integrated into both the construction documents and shop drawing submittals. Precast panelization, panel loading, and connection details were developed and coordinated during the design process, allowing review of precast submittals and fabrication to commence ahead of the final core and shell construction documents. The minimal field issues encountered during erection was a testament to the team's effort to deliver an elegant, efficient precast envelope solution.

Contractor: **RJ Ryan Construction** Architect and Engineer: **HGA** Owner: **United Properties** Location: **Eagan, MN** 



www.wellsconcrete.com



### Sam's Club Layout Center

Crossland Prefab produced the precast concrete for the new Sam's Club Layout Center located in Bentonville, Arkansas. The Sam's Club Layout Center is a 137,750 square feet facility with a final contract of \$9 million. This large facility was built to simulate a Sam's retail store with product and racking layouts. In addition to the large layout space, this building contains a small office, restrooms, and a breakroom. The Sam's Club Layout Center features an interior finish of exposed aggregate precast concrete panels while the exterior precast concrete wall panels had a thin brick wainscot and textured painted upper finish.

The City of Bentonville has specific requirements regarding undulations in the façade of buildings constructed there. The layout of the precast concrete panels needed to match the coursing of the inlaid brick and was required to make two-foot bump-outs every 100 feet of the wall. Two different colors of Endicott thin brick were used by Crossland Prefab to emphasize the undulations, uniformity, and consistency required by the city. The consistency found in using precast concrete was a significant benefit. The panels always looked uniform and the quality of the materials was constant.

The use of precast concrete in this project provided two main benefits - speed and quality. Using precast concrete eliminated the need for extra trades on-site which



sped up the process considerably. Usually, a framer would install a stud framed wall, insulation, and gyp boards. Then a waterproofer would add moisture barrier, and a mason would install the brick. Utilizing precast concrete meant that once the



panels were set up, site construction could immediately continue.

#### **Project and Precast Concrete Scope**

- 136,750 square feet
- Built to simulate a Sam's Club retail store
- 30 feet tall, but only one story
- Three-week precast concrete erection time
- 158 panels totaling 47,800 square feet
- Precast thin brick wainscot and textured painted upper finish

#### Architect: Nielsen Architecture, LLC Contractor: Crossland Construction Company Owner: Walmart

Precast Specialty Engineer: **Needham DBS** Thin Brick Producer: **Endicott Thin Brick & Tile** Location: **Bentonville, AR** 



## **Miesblock Commercial**

Miesblock Commercial is an 18,000 square-foot facility on Grand Avenue in downtown Des Moines that includes a retail / restaurant area on the first floor and two additional floors of office space. The Miesblock name and design is reminiscent of the work of German architect Ludwig Mies van der Rohe who designed the adjacent Catholic Pastoral Center.

The exterior facade of the Miesblock Commercial building features architectural precast concrete insulated wall panels accented with inset black aluminum panels. The south end of the building features a decorative perforated aluminum scrim attached to the exterior that set outboard of the panels.

Precast concrete was chosen based on the its ability to provide a contrast to the metal panels and provide an insulated finished wall that would not require furring out the interior. Precast concrete was also able to accommodate the developer's need for an accelerated schedule that could be challenged by the need to minimally impact a very tight downtown construction site.

Architect: **BNIM Architects, Des Moines, IA** Structural Engineer: **Raker Rhodes, Des Moines, IA** Contractor and Developer: **Nelson Development, Des Moines, IA** 

Location: Des Moines, IA



www.coreslab.com



## Learn & Earn Box Lunches

PCI Midwest provides continuing education programs on a variety of topics. These programs are easily tailored to conference room or classroom lunch programs. Architects and engineers can learn about precast concrete hollow-core floors and walls, architectural precast concrete, precast parking structures, glass fiber reinforced concrete, high performance precast concrete and much, much more. Contact mike@ pcimidwest.org to request a program for you or your company.



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