

Office, Retail Rebound with High Performance Precast Concrete

Designers exploit precast concrete's aesthetic versatility to respond to owners' needs as markets begin to grow again

— Craig A. Shutt

The office and retail markets are on the rebound from the recession that curtailed activity beginning in 2008. Both segments—and the mixed-use projects that combine both—are growing, with clients needing new spaces quickly. As more projects get underway, designers are discovering how high-performance precast concrete components help them meet an array of functional and aesthetic challenges on tight deadlines and budgets.

High Performance precast concrete provides an array of benefits to these projects, including the capability to span long distances that provides flexibility for layouts and inherent fire resistance that saves time and material, leading to lower costs. The fast speed of erection ensures deadlines will be met for moving into new spaces or opening stores to generate revenue. Precast concrete's aesthetic versatility ensures any design style can be achieved, from a contemporary look that stands out to more traditional appearances or aesthetics that match the surrounding office or retail environment.

The following examples of offices, retail spaces, and mixed-use buildings show some of the creative ways precast concrete systems are being used to meet the challenges of building cost-effective, aesthetically pleasing, highly functional, high performance buildings.

Park Place

Park Place in Leawood, Kan., features upscale retail, restaurant, residential, and office spaces. The most recent phase of construction added upscale mixed-use office and retail tenants in two buildings.

Both had to blend with the existing buildings' appearances while creating a distinctive look of their own that would attract tenants and shoppers.

'Schedule was a key reason we chose precast concrete for the façade cladding.'

"Schedule was a key reason we chose precast concrete for the façade cladding," says Gary Schuberth, principal with Opus AE Group LLC, the architect on the project. "We had a tight timetable, and precast concrete, with its capabilities for incorporating thin brick and decorative reveals, gave us the desired exterior design to meet our demanding schedule. A built-up system of metal sheathing and field-laid-up brick would take more time, and installation could be affected by weather and temperature. Because the precast system ensured we could get the buildings enclosed faster, this speed of construction allowed the interior finishes to also be expedited over a more traditional wall system."

Aesthetics also were a major factor, as the designers wanted to project a "New Urbanism" architectural style that was rich in detailing. "Earlier buildings in the complex had this styling, and we wanted to complement it," he explains. "It was a fairly traditional but ornate look, and our goal was to replicate that in an economical way."

The predominance of masonry and decorative elements in those buildings led to the use of embedded

thin brick as well as textures cast with formliners, acid-etched finishes, medallions, projections, and cornice work. "There was a time crunch to meet the tight schedule," says Dirk McClure, regional director of sales and business development for Enterprise Precast Concrete Inc., which fabricated the panels. "The Opus design team knew the look they wanted going in, so we began talking about specific textures immediately."

The goal for the first structure to be built, the office building, was to create a strong focal point for the center. The building was sited at the terminus of one of the main pedestrian retail streets and became the only free-standing building linked to the shopping district. "This building was envisioned to capture and continue the high level of detailing and ornamentation established with the buildings already constructed in the development," explains Schuberth.

Thin brick in four colors cast in different brick patterns replicates the masonry look on other buildings and provide textural detail. A combination of sandblasted and acid-washed textures work with a variety of dimensional reveals to vary the appearance of the building from one portion to another. Decorative precast concrete medallions in a chevron pattern were applied to each column, providing a higher level of detailing and visual texture at the pedestrian retail level.

Blending In

Constructed immediately after the office building, the nearby mixed-use building was sited to continue a group of mixed-use buildings along one of the main pedestrian retail streets. That created the need to

relate to existing building architecture, Schuberth explains. "This building was envisioned to capture and continue the high level of detailing and ornamentation established with the buildings already constructed within the Park Place development."

The building needed to be articulated to create strong visual interest and texture. This goal was achieved by breaking the façade into three differentiated parts to continue the scale of the "zero lot-line" construction in the development, says Schuberth. "Each portion of the façade has a distinct style created through the selection of different brick, precast finishes, and applied and integrated detailing."

Exposed areas also received a combination of sandblasted and acid-washed textures along with dimensional reveals to provide depth and variations. Bold cornices provide strong shadow lines and dimension to what is essentially a fairly simple, flat façade. Ornamental metalwork was added for awnings, infill railings, and for medallions attached to the precast panels.

'The mockup-review process was very efficient to reach approval on the final look.'

The brick colors were chosen for contrast and style, not to match exactly with other brick used in the complex, notes Schuberth. "The use of brick was important, but matching specific colors wasn't critical. The mockup-review process was very efficient to reach approval on the final look." The architect visited the plant during fabrication of the panels to ensure quality control but no adjustments were needed. Four, 4- by 4-foot panels were produced for final approvals, adds McClure. "Reviews were handled both in the plant and at the job site to ensure the required quality was being achieved."

The panels with inset brick were cast with a white backing mix rather than a traditional gray one, McClure notes. "They invested a premium for the white concrete mix, which allowed the appearance of pure white



Park Place in Leawood, Kan., used architectural precast concrete panels in different design styles to complement yet differentiate two new buildings in a large upscale mixed-use complex consisting of retail, restaurant, residential, and office spaces. Schedule and aesthetics were key drivers for selecting precast concrete panels. All photos: Dirk McClure of Enterprise Precast Concrete, Inc.

PROJECT SPOTLIGHT

Park Place

Location: Leawood, Kan.

Project Type: Office and mixed-use buildings

Size: Building J: 65,000 square feet; Building F: 61,000 square feet

Designer/Engineer: Opus AE Group LLC, Kansas City, Mo.

Owner: Park Place Developers LLC, Leawood, Kan.

Contractor: Opus Design Build LLC, Kansas City, Mo.

PCI-Certified Precaster: Enterprise Precast Concrete Inc., Omaha, Neb.

Precast Specialty Engineer: Enterprise Properties, Omaha, Neb.

Precast Components: 526 architectural precast concrete panels (316 for Building J, 210 for Building F).



joints that caused the red bricks to really pop.” Corner detailing also received added focus, creating return pieces to replicate the look of inlaid brick without a notable joint line. “Enterprise did a good job of detailing these pieces in an economical way to create the appropriate look,” says Schuberth.

The site was restrictive, with other retail and office activity around the construction. The west façade of the office building was sited on a zero lot line, and the use of precast concrete panels allowed the façade to be constructed more efficiently with little lay-down area required and in a minimum amount of time relative to a more traditional scaffolded approach that would’ve been required with metal studs and laid-up masonry, Schuberth says. The precast concrete design also allowed for wider ground-floor openings in the façade, which created more flexibility for storefront design, creating versatility for future retail tenants.

The schedule was tight and unyielding, notes Schuberth. “Both buildings were fully leased as of a specific due date, and we had to meet that deadline,” he explains. “The tenants were leaving the buildings they were in and had to be able to move into their new spaces by that day.” Fabricating all the various elements into the precast concrete panels and erecting them quickly so interior trades could begin work ensured the tight schedule could be met.

The result of this attention to detail and leverage of precast concrete’s attributes was two buildings with distinctive looks that opened on time and on budget. “These were challenging jobs,” says McClure. “The appearance had to be highly articulated, the schedule was aggressive and the budget was relatively tight considering the level of detail required. Enterprise likes challenging jobs, and the entire project team really rose to the occasion. To construct the building in a more traditional manner would have made meeting these goals an even more complicated and expensive undertaking.”

Adds Schuberth, “Precast concrete allowed the building team to work creatively with the precaster to integrate masonry, detailed metalwork, and dimensional exposed



concrete. This integration of materials into precast concrete panels created a savings in schedule, labor, and cost while providing a high level of quality. It also provides a highly durable building with much less maintenance.”

La Maison Simons

While precast concrete frequently is specified to replicate the look of traditional masonry and fit into existing campuses, it also can strike out in bold new directions, creating contemporary designs that offer visual excitement and attract attention. Such was the case at La Maison Simons, a long-established department store in Quebec that was looking to update its image and project an upscale, futuristic look.

To achieve this goal with its new 110,000-square-foot store in Ville d’Anjou, Quebec, designers use architectural precast concrete panels cast with a regular pattern of recessed dots fit with fiber optics across the façade that illuminate colored disks inside the recesses, changing the look of the building during the day and night.

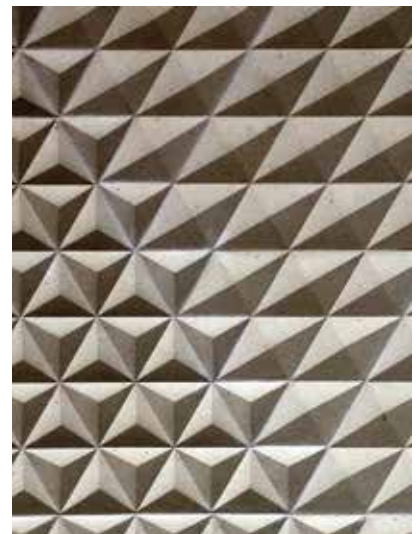
Founded in 1840 in Quebec City, Simons opened its first store in Ville d’Anjou in 1870, where its headquarters remain. With eight stores across Quebec and one in Alberta, the chain is embraced by the area as a family-run success with a trademark green color announcing its brand. “Simon stores have always distinguished themselves with unique and exclusive architecture,” says Philippe Blais, architect at Lemay Michaud Architecture Design.

For this store, he says, “We wanted to create a minimalist building with a unique texture. We achieved just that with the sleek, white concrete surfaces and the impact of the fiber optics.” The fiber optics were embedded in approximately 2,350 of the circular recesses cast into the architectural precast concrete panels. The recesses, ranging in depth to 1 ½ inches and evenly spaced over the panels’ facing, vary in diameter, with each change in depth, size, or alignment requiring a new mold.

“The challenge was to keep the project both economical and interesting for the client in the pursuit of his original design,” explains Guy Tremblay, technical director with Bétons Préfabriqués du Lac Inc. (BPDFL), the precaster who fabricated



La Maison Simons in Ville d’Anjou, Quebec features architectural precast concrete panels cast with a regular pattern of varying-depth recessed dots fit with fiber optics that illuminate colored disks inside the recesses, changing the look of the building during the day and night. All photos: ©Marc Cramer.



PROJECT SPOTLIGHT

La Maison Simons

Location: Ville d’Anjou, Quebec

Project Type: Retail

Size: 110,000 square feet

Cost: \$28 million

Designer: LeMayMichaud architectural design, Quebec, Quebec

Owner: Cadillac Fairview, Ville d’Anjou, Quebec

Structural Engineer: WSP, Quebec, Quebec

Contractor: Construction Albert-Jeand, Montreal, Quebec

PCI-Certified Precaster: Bétons Préfabriqués du Lac Inc., Alma, Quebec

Precast Components: Architectural precast concrete panels in a variety of heights with integrated fiber optics.

the 138 insulated panels, each with about 600 recessed circular block-outs.

"The concept of the store offers an immersion into the world of Simons, its clothing, fashion, glamour, and elegance," explains Blais. "In contrast to its context, the building's architecture is intended to be dazzling and refined while being evocative of the brand's image and vocation. The perception of the store's design is meant to be simple and obvious. The building emerges from the site in the form of a white and green volume, two contrasting colors which serve one another to reveal themselves."

The bright white of the panels symbolizes "purity and elegance," he notes, while the green replicates Simon's brand color. "The use of insulated precast concrete panels allowed the exploration of a texture consisting of points distributed uniformly over the entire façade." The goal was to reflect the patterns found in fabrics or leather clothing and haute couture.

Recessed Disks Sparkle

Approximately 27,000 square feet of the façade were clad with the recessed, decorative panels, which were cast 9'-9" wide in varying heights. A white concrete mix with a light sandblast was used, creating a stark contrast with the fiber optic illumination. Each recess had a painted aluminum disk, featuring a color gradient moving from dark green to white, affixed to its base. The disks are illuminated by the fiber-optic lighting in various computerized combinations of intensity. The recesses are slightly angled on the perimeters to allow draft in the formliner to eliminate suction that would have created difficulty in releasing the panels from the mold as well as to create water outflow when installed.

The panels emphasize the placement of two asymmetric entrances as well as a cantilevered display window that attracts the attention of passersby. At these locations, the dots' diameter is enlarged and the depth gradually decreases. The color gradients continue onto green silkscreened glass, going from opaque to transparent, revealing the interior of the store. The white and green appearance during the day gives way to the illuminated, dotted pattern at night. "The building changes to wear its evening garments," Blais explains.

'The precast concrete patterns not only met the elaborate decorative needs but provided energy efficiency and cost effectiveness, as well as improved durability'

The precast concrete patterns not only met the elaborate decorative needs but provided energy efficiency and cost effectiveness, as well as improved durability. "We wanted to cut down the budget and the schedule for the exterior wall construction, which is why we chose precast concrete insulated panels," Blais says. "The sandwich wall panels resulted in a very economical and easy-to-implement building envelope. It allowed the start of construction on interior systems earlier in the construction schedule."

The designers worked closely with the precasters to maximize the use of each formliner, he notes. New molds were needed for each change in depth or alignment, with the fiber optics woven into the panels during casting. "The design of a simple and repetitive motif limited the number of formliners required," he says.

The erection process took four weeks with the high performance precast concrete panels combing insulation, air and vapor barriers into one efficient system. Other exterior wall systems typically require building multiple components on site. "That is normally done on-site prior to the exterior-cladding installation, which is more expensive and takes more time than work done at a plant," Blais notes. "By using precast cladding, the only work that was done on-site was the precast panel installation."

The close teamwork on the project created a dramatic, innovative design that attracts attention to the retail location both day and night while retaining the elegant, contemporary appearance that the owners wanted to project. "The plasticity and the smooth white finish of the material enabled the design of a unique and exclusive image for the Simons brand," Blais says. "Everybody is talking about the glittering façade."

Summit Executive Center

Precast concrete helped transform a 40-year-old rundown, vacant building in Summit, N.J., into the Summit Executive Center, a Class A office building. To achieve that, the construction team stripped the existing 47,000-square-foot structure to its original concrete core, built a 30,000-square-foot, steel-framed addition, and clad the entire building with architectural precast concrete panels in several finishes. The result was an attractive facility with two floors of offices and two floors of parking for 200 vehicles. The facility has received LEED Silver certification.

"A new façade was needed to transform this tired building, built in 1966, into a Class A office space," explains Mark von Bradsky, principal at Structure Studio, the project's structural engineer. The existing structure couldn't directly support the weight of the new façade, he notes, so several façade systems were investigated and developed that would rely on the building only for its lateral support. All gravity loads would have to be transferred to the building's basement walls and foundations.

'The most viable option from both a cost and constructability point of view was architectural precast concrete'

"The most viable option from both a cost and constructability point of view was architectural precast concrete," he says. "Although there were many challenges imposed by the existing concrete structure, the precast concrete façade system proved to be the best solution."

Time was a key consideration. The project schedule required the enclosure construction to occur during potentially harsh winter weather. "The use of prefabricated elements such as precast concrete was clearly beneficial to achieve a timely completion when faced with weather constraints versus stick-built, field-assembled materials involving wet trade work," he says. "In addition, work performed in a factory-controlled environment with skilled craftsmen ensured tighter tolerances and fewer errors than alternative means of construction."

Precast concrete also offered benefits due to site logistics. Because the structure was located in Summit's busy Central Business District, field-installed masonry would have created greater traffic disruptions around the site. General contractor Gale Construction Co. planned the worksite so the precaster, U.S. Concrete Precast Group, could stage its panel deliveries in an area where a parking structure was to be erected later. This alleviated long-term congestion at the site while keeping panels nearby and ready to be erected as needed.

An integral phase of the construction process was stripping down the existing building to its concrete structure and constructing the new high performance precast concrete, aluminum, and glass façade that seamlessly carried over to the new addition. The precast panels feature modular thin brick and a sandblasted finish, along with multiple shades of smooth banded material and articulated cornice work. The design was approved by the City of Summit, which was a requirement.

The aesthetic qualities that could be achieved with high performance architectural precast concrete played a role in its specification, notes Robert Sandy, project manager for Gale. "The number of finishes and shapes in the cross section of the façade provided an impetus to reduce the number of trades and subcontractors required. That, in turn, led to a reduction in coordination efforts and cost."

Seamless Transition

The design also called for a seamless transition of elements in the façade between the original, gutted reinforced-concrete structure and the new addition. Because the existing structure had limited capacity to carry the superimposed loads of a façade, the precast concrete enclosure was designed to transmit the majority of its weight directly to a new cast-in-place concrete-grade beam with very little load transmitted to the superstructure.

'The initial thought processes and decisions to use precast really proved to be of great benefit.'



A 40-year-old rundown, vacant building in Summit, N.J., was transformed into a Class A office building by demolishing the structure to its original concrete core, adding a 30,000-square-foot addition and cladding the entire new frame with architectural precast concrete panels. All photos: US Concrete Precast Group.



PROJECT SPOTLIGHT

Summit Executive Center

Location: Summit, N.J.

Project Type: Office building

Size: 77,000 square feet

Cost: \$11.4 million

Designer: Rotwein & Blake, Livingston, N.J.

Owner: MRY Associates, Summit, N.J.

Structural Engineer: Structure Studio, Morristown, N.J.

Contractor: The Gale Construction Co., Roseland, N.J.

PCI-Certified Precaster: U.S. Concrete Precast, Middleburg, Pa.

Precast Specialty Engineer: Civilsmith Engineering, State College, Pa.

Precast Components: 251 pieces, comprising wall panels, spandrels with architectural cornices, column covers and site planters.



"The initial thought processes and decisions to use precast really proved to be of great benefit as the project moved from the design stage through implementation," says Sanders. The precaster likewise was proud of what had been achieved, says Steve Kenep, sales director at U.S. Concrete Precast. "The precast concrete design helped the building become LEED Silver certified, provided the aesthetic appeal the owners were seeking, allowed construction to be finished quickly and efficiently with little traffic disturbance, and was a cost-efficient approach."

Iroko Building

Aesthetics, speed of construction, logistical flexibility, and energy efficiency were key reasons why high performance insulated precast concrete was specified for the cladding on the Iroko Building, a 56,000-square-foot, four-story office in Philadelphia. The building was constructed for a relatively young pharmaceutical company that faced an enviable challenge: It was expanding quickly and needed more space to hire more workers as quickly as possible.

In deciding how to create their first office building, the owners laid out specific goals. The foremost challenge was that it needed to be completed as soon as possible so they could begin expanding their work staff. But they also wanted to locate their facility in the Navy Shipyard, as it would emphasize their focus on research and the life sciences while providing them with state and city tax incentives. To project an image of state-of-the-art research, they wanted to design a building that was thermally efficient and architecturally unique. It also had to incorporate local materials as much as possible to tie the building to the city while ensuring LEED certification.

Precast concrete panels helped to meet each of the requirements. The panels were cast 11 inches thick and feature 3 inches of insulation sandwiched between 4-inch wythes of concrete, providing a material R-value of 19. The panels were cast with a light white exterior color to help maximize its Solar Reflective Index, which helps reduce solar heat gain, as well as aids LEED points.

Architecturally, the owners were looking for a unique finish but were unsure of exactly what to choose, says Dave Thomas, project manager for J&R Slaw Precast Inc., the precaster who fabricated the components. "They wanted a unique structure, but they didn't have a set finish or texture in mind," he says. "We presented a variety of options to them."

Designers at Digsau, the architectural firm on the project, initially were leaning toward a board-form finish of some type, but they didn't think it was "spectacular" enough, Thomas notes. Slaw prepared samples of 19 finishes, which led the team to a stacked-board look that creates a dimensional appearance of long, narrow boards jutting out at random spots in the stack. The panels were erected on two full adjacent façades of the building, with glass curtain wall used on the other two. The result is a building that has a strikingly different appearance from every corner.

To further enhance the contrast between the concrete and glass façades, the panels feature random

window arrangements of three sizes of windows, with the stacked-board texture used in sections of random patterns across the face. Only a few form liners were required to achieve all of the textured portions, although the combinations of panels create different patterns across the sides. The form liners were created with a slight draft to the jutting ridges to avoid creating suction on the liners so the panels could be removed easily.

Windows Pose Challenges

While the form liners worked smoothly, the odd arrangement and sizes of the window penetrations created challenges, Thomas says. "The window positions didn't always fit into the ends of the panels smoothly. Some ended up in the center of the panels, requiring a panel shape almost like a 'W' to be cast." The panels were cast with a multitude of strongbacks to support the gaps in the panels.

"Transporting the panels to the site was an issue, as we couldn't put them on a 45-degree angle to ship them due to the fragility of the design," Thomas explains. They





The Iroko Building in Philadelphia was built on a tight time frame so a growing pharmaceutical company could expand its operations. The precast concrete panels used to clad the building helped speed up construction, meet the aesthetic challenges, and help attain LEED certification. All photos: Dave Thomas.

PROJECT SPOTLIGHT

Iroko Building

Location: Philadelphia, Pa.

Project Type: Office building

Size: 56,412 square feet

Cost: \$15.4 million

Designer: Digsau, Philadelphia, Pa.

Owner: Liberty Property Trust, Malvern, Pa.

Structural Engineer: Environetics, Philadelphia, Pa.

Contractor: Penn Construction Co., West Chester, Pa.

PCI-Certified Precaster: J&R Slaw Inc., Lehigh, Pa.

Precast Specialty Engineer: Civilsmith Engineering Inc., State College, Pa.

Precast Components: 32 insulated architectural panels, 11 inches thick including 3 inches of insulation.



were secured on trucks individually and arrived at the site undamaged. An asphalt parking lot adjacent to the site provided plenty of room for staging the panels for erection as needed. "There was lots of room for staging, so we were able to move them quickly into position," he says. The precaster's plant was located two hours away, so only a few panels had to be stored at the site as new deliveries were made quickly.

The strongbacks were carefully removed from the panels as they were erected to ensure no cracking or positioning issues arose. The precast concrete panels overhang the curtain wall at the corners, so a butt joint was used on the panels to butt the curtain wall against the panel backs.

The curtain wall features multiple glass types, as well as vertical mullions that create "fins" projecting from the facing. The mullion design weaves into a rich and textured pattern that offers visual interest while mitigating solar heat gain and glare. The verticality of the textures contrasts with the horizontal depth provided by the precast concrete facings of the building.

Erection of the 32 precast concrete panels, typically measuring 45 feet wide and 13'5 1/2" tall, took only five days. That ensured interior trades could begin their work quickly, leading to the building being completed just one year from when the contract was awarded.

"The process we used to find an aesthetic design that pleased the owners while providing a cost-effective design shows how precast concrete can be used to satisfy unique customer needs," says Thomas. "Its façade treatment sets this building apart from what others could have achieved with other materials."

These examples show some of the range in textures, colors, and state-of-the-art technical design that is being achieved with precast concrete systems. Office and retail projects both can leverage the material's benefits to create buildings that are attractive to tenants and visitors, providing designs that are cost-effective, aesthetically pleasing, thermally efficient, and quick to complete. 