The Aesthetic Versatility of Precast

Aesthetics is of great importance to universities. Many universities' structures relate to the very culture and tradition that the university was founded on. In other words, they are not just structures or buildings, but rather expressions of what the university stands for. Sometimes, aesthetics are used to create a focal point for the university, marrying tradition with innovation. Whether a project needs a traditional look, or needs to make a cutting edge statement, precast concrete provides high performance aesthetic versatility to accomplish your goals.

Precast concrete is available in practically any color, form, and texture. Precast concrete can also be veneered with other traditional building materials such as brick, granite, limestone, terra cotta, tile, and more. This provides the look and feel of these materials while adding all the benefits of precast concrete.

Different finishes can also be combined for one project, even in one panel, without requiring multiple trades and additional detailing for movement and waterproofing. It offers an efficient way to develop a multitude of façade treatments while reducing costs and risk.

The next few pages show some of the capabilities of precast concrete's aesthetic versatility on higher education projects throughout the United States.

Montclair State University Parking Structure

Montclair, N.J.

Architect: *Clarke Caton Hintz, Trenton, N.J.*

Structural Engineer: *Fay Spofford Thorndike, Fairfield , N.J.*

Contractor: *Epic Management Inc. Piscataway, N.J.*

Owner: *Montclair State University, Montclair, N.J.*

Precaster: *Nitterhouse Concrete Products, Chambersburg, Pa.*

Photo: Nitterhouse Concrete Products.

To help the state's second-largest university reach its governing board's goal of increasing its student body to 18,000, a new seven-and-one-half level, 1,532-space parking structure was built. A bright-white, lightly sand-blasted concrete mix was used for the exterior panels and walls, which contrasted sharply with the vibrant red accents used on the panels, the roof, and the stair towers. The design of the exterior precast concrete also featured open arches and reveals to replicate the Spanish mission-style architecture of the other campus structures.

A key innovation on the project was the use of the bolted-on precast concrete arches. The architect designed the arches in pieces that could be shipped easily to the site, then bolted and welded to the spandrels. As a result, a fully rounded arch spandrel was achieved at a fraction of the cost of having to produce and erect the arched spandrels as one composite unit.

The design also incorporates a walkway occurring at the southern corner of the structure that connects the facility with the existing campus pedestrian circulation system.

University of Scranton, Condron Hall

Scranton, Pa.

Architect: *Burkavage Design Associates, Clarks Summit, Pa.*

Precast Architect: *Equus Design, Belmont, Mass.*

Structural Engineer: *E.D. Pons & Associates, Wilkes-Barre, Pa.*

Contractor: *Quandel Enterprises, Harrisburg, Pa.*

Owner: *University of Scranton, Scranton, Pa.*

Precaster: *Oldcastle Precast Building Systems, Edgewood, Md.*

Photo: courtesy of Oldcastle Precast Building Systems.

Condron Hall, at the University of Scranton, was designed and completed in just ten months. The 108,000 sq. ft., seven-story, student residence hall provides 386 beds in a two-bedroom suite-style arrangement. The structure replaces older, less desirable facilities and improves the quality and consistency of undergraduate housing on campus.

To blend in with the rest of the campus, thin brick of different colors and coursing patterns was embedded into precast concrete wall panels. Several brick colors and sizes were specified in the panels–using more than 125,000 thin brick units. The precast wall panels also included lightly sandblasted window trim, banding, and corner pieces to replicate limestone. Also, the University seal and building name were cast into the precast panels at the entrance using a form liner.

The project utilized a total precast concrete building system. The interior and exterior walls, floors, columns, beams, stairs, and the roof were all made of precast concrete. This allowed unobstructed clear spans and permitted the project to meet the tight timeline.

Photo: ©Vince Streano/Walker Parking.

Duke University Research Drive Parking Structure

Durham, N.C.

Architect: *Ratio Architects, Indianapolis, Ind.*

Structural Engineer: *Walker Parking Consultants, Indianapolis, Ind.*

Contractor: *Bovis Lend Lease Inc, Durham, N.C.*

Owner: *Duke University, Durham, N.C.*

Precaster: *Gate Precast, Oxford, N.C.*

Precast Specialty Engineer: *ETE Inc. Matthews, N.C.*

The new parking garage is the first, free-standing, single-use parking structure certified by the US Green Building Council in the U.S., earning 31 LEED® points. It is also the 19th LEED certified project at Duke University. It is located in the research zone of the campus adjacent to a medical clinic. Several new building projects in the area eliminated surface parking and necessitated the construction of a new facility to provide parking to students, faculty, visitors, and patients. Garage visitors are educated about sustainable design through learning centers in the elevator lobbies.

The architectural context of this garage blends well with the surrounding buildings but also provides for a sustainable green design. The precast concrete spandrels and column covers provide a monolithic color at a distance while the medium-sandblast finish allows the red stone aggregate to provide a mix of color close up. The mixture of precast concrete spandrels and the terra cotta and stone material at the lower levels provide a unique design solution, which gives the facade a variety of textures and colors to reduce the scale of the building. The precast column covers provide a vertical element to the facades while concealing the concrete columns. Reveals in the precast provide a more human scale and align with the curtainwall mullions and tile joints. The structure also incorporates green walls and roof canopies.

University of Wisconsin Madison, Physical Plant

Madison, Wis.

Architect: *Strang Inc., Madison, Wis.*

Structural Engineer: *Arnold & O'Sheridan, Madison, Wis.*

Contractor: *Kraemer Brothers, Plain, Wis.*

Owner: *University of Wisconsin Madison, Madison, Wis.*

Precaster: *Mid-States Concrete Industries, South Beloit, Ill.*

Photo: courtesy of Mid-States Concrete Ind.

The UW Physical Plant was a project of necessity. The relocation of the Physical Plant was needed to accommodate growth and decompression from the other physical plant facilities and to make room for a nearby heating plant project.

Continuing with UW's commitment to architecture, the precast concrete wall panels were finished with two colors of thin brick on the three main elevations of the structure, which complemented the campus neighborhood. The brick was fairly detailed using soldier coursing, reveals, and returns to match existing architecture. The rear elevation was a buff-colored, lightly sand-blasted finish. All the wall panels were insulated. "We saved valuable weeks using precast instead of conventional masonry," said Bill Kolar, project manager for Kraemer Brothers. The precast allowed the building to be erected in just 13 days.

Central Community College Residence Hall

Columbus, Neb.

Architect: *Wilkins Hinrichs Stober Architects, Kearney, Neb.*

Structural Engineer: *Performance Engineering, Omaha, Neb.*

Contractor: *BD Construction, Columbus, Neb.*

Owner: *Central Community College, Grand Island, Neb.*

Precaster: *Coreslab Structures (OMAHA), LaPlatte, Neb.*

Photos: Paul Brokering Photography.

This project is part of a larger housing master plan for Central Community College's Columbus Campus. The new residence hall is phase one of the multi-phase project; thus, it had to set the standard for aesthetics and constructability. The building consists of 18 rooms which can house up to three students each. There is a common living area, as well as kitchen, study, and laundry space.

The use of precast concrete insulated wall panels served structural, thermal, and electrical purposes all while meeting the owner's exterior and interior aesthetic needs. The attractive exterior aesthetics were achieved by using a combination of acid etching, sandblasting, and thin brick. The unique size of the panels provided opportunities for the designers to create interest and to control cost by using repetitive patterns enhancing the look of the façade. These large 16 ft. x 16 ft. panels also made it possible to hide panel joints with the interior partition walls, providing a durable and seamless interior finish ideal for residence halls. The precast concrete manufacturer focused on providing a smooth back finish and strategically located lifting devices to provide a high quality finish surface ready for paint.

Missouri State University, JQH Arena

Springfield, Mo.

Architect: *Ellerbe Becket Inc., Kansas City, Mo.*
Structural Engineer: *Martin / Martin, Lakewood, Colo.*
Contractor: *JE Dunn Construction, Kansas City, Mo.*
Owner: *Missouri State University, Springfield, Mo.*
Precaster: *Prestressed Casting Co., Springfield, Mo.*

Photos: Prestressed Casting Co.

The 11,055 seat arena is home to the Missouri State Bears and Lady Bears basketball games and also used for concerts and other large capacity events. Precast concrete was selected for the exterior of the arena for economic reasons. A key challenge was to create a precast panel that did not look plain on the tall walls. The solution was a textured liner, using an "Oak Tree Bark" finish, with an intricately laid out pattern to match each adjacent panel. The result was a unique façade that complements the surrounding architecture and pays tribute to the region. The precast concrete wall panels were also left exposed to the interior providing a durable surface with a Frenzo trowel finish.

Using precast concrete as the structural system also allowed many advantages. For example, the column and raker beam system allowed for an open, usable space under the spectator seating. The project was also able to be erected in just 75 days, which was ahead of schedule, despite being constructed during the wettest spring on record and uncovering an artesian well during excavation.

University of Nebraska - Maverick Village Parking Structure

Omaha, Neb.

Photo: Kessler Photography, 2009.

Architect: *Holland Basham Architects, Omaha, Neb.*
Structural Engineer: *Nielsen-Baumert Engineering Inc., Omaha, Neb.*
Contractor: *Kiewit Building Group Inc. Omaha, Neb.*
Owner: *University of Nebraska at Omaha, Omaha, Neb.*
Precaster: *Coreslab Structures (OMAHA), LaPlatte, Neb.*

This unique 280,485 square foot, five-level parking structure, comprised completely of precast concrete, adds nearly 900 spaces for the university.

One of the key objectives for this project was not only to conform to the campus standards, but to design the exterior facade to look like a classroom building. Great detail was integrated into the exterior wall panels, including thin brick, exposed aggregate, sandblasting, and multiple reveal patterns, to help achieve this objective. Although intricate in detail, the architect's design allowed for only two mirror image casting forms for the vast majority of the exterior panels, saving both cost and time. Additionally, the wall panels function as load bearing shear walls. The design strategy of using one component to serve multiple functions helped to maximize the time and material cost savings of using precast concrete. Because of the length and stiffness of the garage, the stair towers in opposite corners were designed as free standing to alleviate thermal stress accumulation.