

The Aesthetic Versatility of Precast

Precast concrete provides excellent aesthetic versatility. It is available in practically any color, form, and texture. Precast concrete can 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 with less cost and detailing time. K-12 schools and higher-education projects both have specific aesthetic qualities they must provide, either to invoke a traditional appearance that blends with other buildings or to inject a contemporary image of cutting-edge learning. The next few pages show precast concrete's aesthetic versatility in projects throughout the United States.

Kearney Elementary School

Kearney, Neb.

Architect: Wilkins Hinrichs Stober Architects, Kearney, Neb.

Structural Engineer: DLR Group, Omaha, Neb.

Contractor: Hampton Commercial Construction, Lincoln, Neb.

Owner: Kearney Public Schools, Kearney, Neb.

Precaster: Coreslab Structures (OMAHA) Inc., Omaha, Neb.



This 57,862-square-foot K-5 school uses precast concrete insulated sandwich wall panels to help meet its program requirements. The combination of three finishes on the exterior walls creates a unique look that helps the school blend into its surroundings.

The dominant portion of the façade consists of thin brick embedded into the precast concrete. The brick consists of real clay brick that allows for the character and beauty of masonry with the added benefits of precast concrete. The darker buff concrete features an acid-etch finish while the lighter finish was provided by a deep sandblast. This finish strategy allowed the designers to use a single precast panel to mimic the look of several interfacing materials while reducing the number of trades required.

The school's windows were placed higher on the walls to allow for natural light while preserving classroom wall space. The higher window locations also help reduce the amount of outside distractions interfering with class time. The precast concrete wall panels were left exposed in the high volume areas to provide a durable interior surface.

The interior surface of the panels received a smooth troweled finish during casting allowing for an efficient application of paint in the field.

Tucker High School

Tucker, Ga.

Architect: *Milton Pate Architects, Tucker, Ga.*

Structural Engineer: *Bennett & Pless, Atlanta, Ga.*

Contractor: *Turner Construction Company, Atlanta, Ga.*

Owner: *DeKalb County School System Design & Construction, Tucker, Ga.*

Precaster: *Metromont, Hiram, Ga.*

The Tucker High School project consists of a 340,000-square-foot high school that was built in two phases. It replaces the existing school that was built in 1963, on the same site as the original 1918 school.

The building program dictated that the new construction occur around the existing buildings to accommodate ongoing and uninterrupted school activities on site.

Phase one included two-story and four-story precast concrete academic classroom buildings plus a three-level parking facility. This phase also featured a separate two-story administration building that contains all administration, a media center, art and science labs, and the ninth-grade academy classroom spaces.

Phase two construction followed immediately and completed the campus with technology classroom labs, a 600-seat auditorium, a 1,200-seat gymnasium, a renovated cafeteria and kitchen space, athletic fields, and landscaped courtyards.

The exterior finish comprises a thin brick veneer embedded into precast concrete panels with lightly sandblasted precast to mimic limestone. The stone veneer at the bottom of the Media Center was hand-set to the precast backup panel. The interior precast concrete walls contained a smooth trowel finish and were painted, providing a durable finish.



Photo: George Spence, Metromont.

Rochester Memorial Elementary School

Rochester, Mass.

Architect: *Flansburgh Architects, Boston, Mass.*

Structural Engineer: *EDG Inc., Medford, Mass.*

Contractor: *Gilbane Building Company, Boston, Mass.*

Owner: *Town of Rochester, Rochester, Mass.*

Precaster and Precast Specialty Engineer: *J. P. Carrara & Sons, Middlebury, Vt.*

The town's only elementary school, a pre-K–6th grade facility serving more than 600 students, has seen significant enrollment increases in recent years. The school needed to expand quickly to keep class sizes reasonable. The decision was made to renovate all portions of the existing school and add new classrooms, along with additional space for music and support activities; approximately 34,000 square feet in all.

Precast concrete was selected for the addition due to the many benefits associated with it. Some of the key benefits included superior sound isolation, thermal mass and energy efficiency, fire and storm resistance, and speed of construction, which was of particular importance on this project. The two-story, 22-classroom addition was completed in just 10 months from design to occupancy. The entire addition was enclosed in just three weeks.

Another advantage of using precast concrete panels was the variety of exterior choices. In this case, the use of thin brick embedded in the precast panels matched the existing school and eliminated the periodic sealing or tuck-pointing required with traditional brick. The base, banding and sills consisted of gray-colored precast. On the inside, the precast concrete panels were smooth and ready for painting with no additional preparation.

The completed school addition complies with MA-CHPS (Massachusetts Collaborative for High Performance Schools), a certification which encompasses school design, construction and operation, energy and water use, lighting, temperature control, and acoustics. Precast concrete panels helped meet several of the criteria for environmentally-friendly schools.



Photo: Joanna Callas.

University of Minnesota Science Teaching and Student Services Building

Minneapolis, Minn.

Photo: Jim Gallop, Gallop Studios.



Architect: Kohn Pedersen Fox Associates, New York, N.Y.

Parking Designer/Engineer: HGA, Minneapolis, Minn.

Contractor: McGough Construction, St. Paul, Minn.

Owner: University of Minnesota, Minneapolis, Minn.

Precaster: Gage Brothers Concrete Products Inc., Sioux Falls, S.D.

The Science Teaching and Student Services building is prominently sited on a bluff overlooking a river, opposite a prestigious art museum and at the head of a prominent bridge.

The building serves a dual purpose: a state-of-the-art learning center with Active Learning Classrooms (ALCs) and science teaching classrooms as well as a "one-stop center" for student services such as registration, financial planning and life planning/career services. In addition, the center includes a student lounge, cafe and numerous informal student study areas.

The building links the east and west campuses and facilitates pedestrian flow through the building while visually engaging the user with panoramic views of the river and downtown skyline.

The five-story building's architecture incorporates various building materials on its façade, which takes cues from the urban campus structures, the serenity of the museum and the fluidity of the winding river.

Scalloped and curved architectural precast concrete components anchor the building into the river's bluff, while the building's base echoes the warm ochre color of native limestone. The precast concrete components transition to a glass curtain wall with energy-efficient glazing, which creates a fluid façade on the river side.

The eastern facade utilizes striated brick-faced precast concrete wall panels and horizontal strip windows to link the structure to the orthogonal nature of the existing campus buildings. Given the complexity of urban campus design and the program requirements, precast concrete met or exceeded the architectural design requirements. The integrated architectural finishes and durability of the high-strength concrete will stand the test of time for years to come.

Willow Creek Elementary School

Fleetwood, Pa.

Architect: AEM Architects, Inc., Reading, Pa.

Structural Engineer: Multani Associates, Reading, Pa.

Contractor: Wohlsen Construction, Lancaster, Pa.

Owner: Fleetwood Area School District, Fleetwood, Pa.

Precaster: High Concrete Group LLC, Denver, Pa.

The \$22.1-million, 108,000-square-foot Willow Creek Elementary School, which opened for the 2009–2010 academic year, features 44 classrooms, a cafeteria, gymnasium, library, computer labs, and art and music classrooms for about 700 students. The two-story school was enclosed with masonry-clad precast concrete sandwich wall panels that provide a thermally efficient R-16.

The exterior design is simple, providing an academic schoolhouse feel with a positive sophistication. The main visual field is a reddish-gray Glen-Gery thin-brick veneer complemented with strong buff-pigmented lintels and sills. Buff stair towers and accents in a light sandblast finish break up the field. Cut stone-like reveals bring a classic element that creates contrast while conveying substance.

According to project architect Justin H. Istenes of AEM Architects, Inc., the enclosure was chosen because "precast is built to last." The precast walls were constructed with carbon-fiber shear trusses to be fully structurally composite, allowing the interior and exterior wythes to act together to resist gravity, lateral and seismic forces. Rigid XPS foam insulation was sandwiched inside.

Back surfaces of the insulated panels were trowel-finished "with a smoothness that almost looks like gypsum board," says Istenes. The walls were painted off-white to serve as the exposed surfaces of the classrooms and halls. Precast concrete also was used for the interior walls to allow the project to flow more smoothly during erection than using steel and block would have allowed. Conduit for exterior lighting and fixtures was cast into the interior wythes for aesthetics and durability over time.



Photo: AEM Architects, Inc.

Hickory Hills Elementary School

Springfield, Mo.

Architect: Jack Ball Architects, Springfield, Mo.

Engineer: Pinnacle Design Consultants, Springfield, Mo.

Contractor: DeWitt & Associates, Springfield, Mo.

Owner: Springfield Public School District, Springfield, Mo.

Precaster: Prestressed Casting Company, Springfield, Mo.

The Hickory Hills Elementary School was designed to follow the contours of the existing site. Building form and materials pay homage to the area's agricultural heritage in a modern way with a touch of technicality. Constructed of precast concrete with some masonry, the building's durability is one of its most sustainable features.

A custom-mix design was created for the precast concrete, balancing color throughout the building's exterior and interior. Material used in the custom mix design was all found within the state, helping the regional and local economies while providing an environmental connection. The precast concrete panels are light gray and feature black granite sand to add contrast and character to the light matrix color. The panels also received a medium sandblast finish. Panels are angled at the outside edges, making them a focal point of architectural vernacular on the building.

The project was designed to achieve LEED Silver certification by encouraging decisions that promote sustainable development and create educational tools for students and the community. Precast concrete contributed to reaching these objectives in many ways, including using regional materials, incorporating recycled materials in the concrete and accelerating the speed of construction. The latter was vitally important, as the substantial completion date and the start of the 2010 Spring semester were only days apart.

Acoustical performance of interior spaces is a critical element in the design of LEED certified buildings, and precast concrete helped achieve this goal. It reduced the acoustical treatments for sound transmission through walls, which helped maintain a responsible budget towards the overall project.



Photo: Ryan Faust



Idaho Broadview University

Boise, Idaho

Architect: Mahler & Associates Architecture, St Cloud, Minn.

Engineer: Duffy Engineering & Associates, Inc., St Cloud, Minn.

Contractor: Winkelman Construction, St Cloud, Minn.

Owner: Globe University

Precaster: Hanson Structural Precast, Salt Lake City, Utah

The two-story, 30,000 square foot building is used for vocational and technical training. The college serves the greater Boise area. Precast concrete was used for both the structural system and the building's envelope. The aesthetic versatility of precast concrete allowed for several finishes to be combined into single panels. Formliners were used to create the split block-like stone at the base. The upper sections used a combination of thin brick embedded into the precast concrete and a light acid-etched finish.