

PCI Central Region
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Issue 26

The building on fire in these photos was a 4-story condominium project constructed of wood and steel with an abutting new precast concrete parking garage. The materials in the buildings met the fire code, yet all were destroyed except the concrete. Concrete is a non-combustible building material that will never burn, it's inherent properties making it the ideal building material for safety.

Photo below: The fire after 2 hours



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*“At the end of the day,
 if the parking garage
 had been destroyed,
 we probably would not be
 rebuilding this complex
 due to overall cost.
 Concrete saved us in the
 big scheme of things.”*

*~Jason Schoettle
 Flaherty & Collins*



Photos above and left:

The aftermath: The wood and steel are destroyed. The photo on the left shows a wood crate 10' from the fire that was protected from damage by the concrete.



Photos above:

Concrete was added to repair the spalling. The work took just over 2 weeks.



Although the fire burned against the precast concrete structure for more than 12 hours, the structure was immediately accessible and suffered little damage other than spalling on the exterior and soot from the combustible materials. There was no loss to structural integrity.

Fire is an ever present danger that must be addressed for all structures. It represents a catastrophic event in regards to safety as well as cost. When a fire does break out, people rely on the designer of each facility to build in safety on their behalf. It is an unspoken expectation of everyone who walks into any building.

Precast Concrete and Fire Safety video at www.pcicentral.org

Pymatuning State Park

Andover, Ohio

The Willoughby is a preassembled precast concrete restroom building. The building exterior has a simulated barnwood texture with simulated stone on the lower sections, while the roof is a simulated metal ribbed roof texture. The concrete is pigmented and stained to the customer's specifications.

The interior consists of two (2) ADA restroom compartments, male and female. Each compartment has a toilet, lavatory, concealed hand dryer, stainless steel mirror, stainless steel lockable toilet paper dispenser and stainless steel ADA grab bars. Upgrades may include skylights, a stainless steel toilet and lavatory package, exterior stainless steel water fountains, and an exterior frost proof hose bib.

The fully assembled building is set in one day from loading at the plant to delivery installation over pre-installed utility stub ups on the prepared foundation. After the contractor made the final utility connections, the building was ready to use.

Pre-assembled precast restroom buildings provide needed restroom facilities without the extended jobsite interruptions created by normal construction methods, providing customers with an affordable, aesthetically appealing facility that is virtually maintenance free.

"Due to the quick installation of the precast restroom building, the park was not disrupted and was able to stay open during the entire construction process. Also, as the contractor our labor costs were greatly reduced, which adds to the bottom line."

~Easton Excavating Contractors



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Owner: Ohio Department of Natural Resources

Engineer: MS Consultants

General Contractor: Easton Excavating Contractors

Catholic University of America - Opus Hall

Washington, D.C.

“We were nervous about the panels at first because we had all seen the earlier generation of brick covered precast that did not look like real brick at all. On a traditional campus like Catholic we were very concerned that this would be obvious and look commercial and artificial. I have to say that our panels are beautiful. They look exactly like hand set masonry. There are even slight variations in the planes of the individual bricks.”

— Beth Buffington
Little + Associates
Project Architect



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Catholic University had a vision to create a new Residential Life Facility that could integrate technology with state-of-the-art amenities into their “collegiate Gothic” architectural design. The new 7-story facility houses 400 students and is registered as a “green” (environmentally friendly) facility with such things as a thermally efficient building envelope as well as energy efficient appliances and heating and cooling systems.

The walls are pre-insulated, with edge-to-edge insulation with the layers of concrete tied together using non-conductive connectors, allowing the walls to be free of any thermal bridges. This results in a wall with a material R-value of R-14.25 ci, greatly exceeding the required R-value imposed by ASHRAE 90.1-2004 of R-5.7 ci. The overall thickness of the wall panels are 8 ½” which maximized floor space. (4” interior structural concrete, 2” continuous insulation, and 2 ½” architectural concrete face). The insulation and non-conductive connectors are manufactured by Thermomass Building Systems. These sandwich panels were designed to be structural, architectural, exposed interior concrete surface and the sole source for thermal and moisture protection. The walls were constructed with an insulation possessing a water vapor perm rating of 0.03 (according to ASTM C1289). This qualifies as a vapor barrier according to the IBC.



Jordan Valley Innovation Center

Springfield, Missouri



“Precast concrete with cast-in thin brick veneer turned out to be the optimal solution. In addition to meeting the structural and aesthetic requirements, the precast towers were able to be erected with minimal disruption of traffic and with very minimal lay down area required. As with any project, especially a project built adjacent to an existing, very out of plumb building, numerous challenges were encountered... I believe the choice of the right material and good teamwork led to a very successful project.”

Ben Jennings, P.E.
Structural Engineer & Vice President
Butler Rosenbury & Partners, Inc.



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Missouri State University's choice of the 1920's era MFA Mill as the future site for a state of the art research facility created several interesting challenges for the design team, who recognized that floor space was at a premium. They quickly determined that 7 and 8 story stair and elevator towers should be added to the north and south sides of the existing structure. That challenging decision was amplified by limited construction space that required the new tower construction to happen from the busy downtown street in front of the site. Upon further review, the engineer also determined that the new towers must be self-supporting, as no additional gravity loads could be carried by the existing mill structure.

Because of the challenges presented and the owners desire to have a brick veneer to match adjacent construction, precast concrete structures including stairs, decks and walls with integral brick were chosen for the new towers. Precast veneer across the west face of the structure, both in sandblasted finish and integral brick, completed the façade of the project. As an added benefit, street access was closed for less than three weeks for precast erection, which was months less than anticipated for traditional masonry construction. These choices allowed the owner to meet the existing structural needs of the mill while greatly decreasing the time required to erect the towers.



Design Firm: Ross & Baruzzini

Structural Engineer: Butler Rosenbury & Partners

General Contractor: DeWitt & Associates

Royal Canin

Puslinch, Ontario

“The exterior walls on the project were originally conceived to be insulated metal wall panels, however, during various meetings it was determined that the insulated metal wall panels would not withstand normal abuse from the daily operations of the facility. Various options were reviewed, but the option selected was precast. The insulated precast wall panels incorporated in the project gave us a solid wall that would withstand normal abuse, yet still gave us the insulation value we were looking for, and was economical”

~Ryan J. Harris,
Nelson Timbro

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Royal Canin manufactures premium dog and cat food internationally. This facility is designed for lean production and total quality management throughout the process. The designers turned to precast concrete to supply the efficient, durable and economic structure for this ISO-certified manufacturer. The insulated precast wall panels are ten inches thick. Ninety-one panels are non load-bearing and twenty-six are load-bearing. Heights of the wall panels ranged from 9.5 to 13.7 metres. Installation required three move-ins.

The panels contained the maximum amount of insulation possible, and the design accommodated several additional and/or modified openings as required by Royal Canin. The insulated precast wall panels were manufactured with lifting devices and embedded hardware to achieve less solid concrete sections and more insulation as required for the safe storage of the food products.



Design Firm: Allen Chui Architects, Inc.

Engineer: Rietz Consultants Ltd

General Contractor: Carl A. Nelson & Co. dba Nelson Timbro

Precast Concrete Solutions - Video Series

www.pcicentral.org

PCI Central Region presents a series of short video presentations addressing the design flexibility and high performance of Precast Concrete.

Precast Concrete Schools

Excerpts from interviews with an AIA, Leed AP architect discussing his experiences in building schools with Precast Concrete. (8 minutes)



Precast Concrete and Fire Safety

A case study of a condominium project fire and the resulting performance of the adjacent Precast Concrete parking structure. (6 Minutes)



Precast Concrete and High Impact Events

A “Wind Cannon” test that fires projectiles at various types of commercial wall systems, exhibiting storm and blast resistance. (4 Minutes)



Precast Concrete and Seismic Safety

The national “Shake Table” test that subjects a Precast Concrete structure to the extremes of seismic activity. (4 Minutes)



Any questions, please email phil@pci-central.org or call 937-833-3900.

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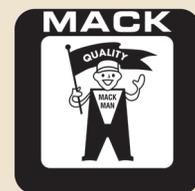
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