

Focus of this Issue: Building Systems and Hollow Core Slabs

Precast Concrete System Satisfies Cornell's Requirements

The original plans for this Residential Initiative showed hollow core plank on a steel frame, but came in over budget. The Construction Manager/General Contractor, Welliver McGuire, Inc. convened a meeting with the owner, architect, and precast supplier, all working together, to develop a buildable solution to Cornell's housing needs. The primary concerns were a 100 year building requirement, fire resistance, durability, speed of construction, and adaptability for future reconfiguration of space. This adaptability concern was highlighted by Cornell's recent demolition of an old, load bearing masonry building whose small rooms were not convertible to other uses.

The use of exterior load bearing walls and long clear span floor and roof plank (average of 40' spans) met all of their requirements. And by also including the precast stairs and landings, the job was able to be tightly scheduled to minimize onsite staging area requirements and reduce the number of contractors working on a very tight site. Each building was fully erected in about 8 weeks, easily half the time needed for plank and block.

Pictured are two buildings, each with five floors plus roof. This precast systems project comprised: 12" Spancrete hollow core plank (99,710 s.f.); exterior precast walls (223 pieces, 56,254 s.f.), interior precast concrete walls (170 pieces, 26,189 s.f.); plus prefabricated concrete stairs and landings. The concept worked so well that the University stayed with it from the Phase 1 project through Phases 2 & 3, and is using it for the last phase, which consists of Houses 4 and 5, scheduled to begin erection in April 2007.

The Design Architect was Keiran Timberlake, Associated, Philadelphia; Contractor was Welliver McGuire, Inc. Montour Falls; owner is Cornell University, Ithaca; and precast supplier Oldcastle Precast, Building Systems Division, South Bethlehem. Thanks to Nesil Normile and Bob Cox from Oldcastle and to Norm Aidun, Senior Project Manager, Welliver McGuire, Inc. for this story.



Bearing walls, clear span floors, and stair/elevator towers being installed
Photo by Welliver McGuire



Dormitory complete; brick and stone added for campus compatibility
Photo by Oldcastle Building Systems

Banks are Supposed to be Solid, Sturdy, Sound, and Impressive Structures



Concrete multi-colored panels make up the building's façade

Rendering by Tecton Architects PC

As the pictures illustrate, the Naugatuck Savings Bank is exactly that – solid, sturdy, and sound while presenting an impressive façade. The bid documents, as prepared by the Architect (Tecton Architects PC of Hartford, CT), specified that the concrete panel supplier must be a PCI Certified Plant. The General Contractor (Bartlett, Brainard, Eacott of Bloomfield, CT) evaluated the possible choices, and selected Lakelands Concrete Products, Inc., Lima, NY as his supplier.

Except for the glass main entry, the exterior façade is entirely precast panels. Using three separate mix designs, Lakelands cast panels with varying details, textures, and colors. This ranged from the grey fractured fin column covers to exposed pink granite in the recesses of the ribbed header panels to the white cement with pigment used for the major window wall units. After casting, panels received an acid wash to expose aggregate and highlight the individual form finishes, such as the matching rustication lines.

Lakelands set up 17 different forms in order to cast 10 pieces on an average day, supplying 280 total pieces which amounted to over 12,000 s.f. of architectural precast concrete panels. Roof coping, window sills, and all horizontal and vertical recess details were included within each piece. The largest piece was 32'-5" x 6'-5".



Texture, detail, and colors combine for visual appeal
Photo by Lakelands Concrete Products

PCANY Website

All PCANY members now have access to the Members Only Page, where varied reports, communications, meeting notes, etc. will be posted. There is also a new category listing, Complimentary One Year Membership, which will be given to every attendee at a PCANY seminar or workshop; or it may be requested simply by visiting...

www.pcanyc.org

Blast Design and Progressive Collapse Case Study – Fort Drum

David Wan, P.E., Chief Engineer, Oldcastle Precast Inc., has written an article for publication in PCI Ascent. In it he explains how precast hollow-core plank on the new WSAAF military barracks structure at Fort Drum, Watertown, NY meets new Department of Defense requirements to resist blast design and progressive collapse. For those in the design community that had concluded precast concrete would not be able to satisfy these new rules, he presents a case study showing how precast met both design and budget requirements.

To minimize potential for collapse from an internal blast, all bearing walls are carried down to footings (no transfer beams or columns at the lower levels). To minimize damage from an external blast, use the party walls for bearing, running the plank parallel to the exterior walls. This then leaves the building end bearing walls exposed to a destructive blast force. The solution was to add an additional interior bedroom bearing wall in each end unit; the end bays of plank were then designed to function as 10'-8" spans with 10'-0" cantilevers should the end wall collapse. Typical plank were 20'-8" simple span. And to resist load reversal from an interior blast force, two 7/16" 270 ksi top strand were designed into every plank on the job to work in conjunction with the plank dead load to resist an upward force.

Oldcastle supplied over 146,000 s.f. of 8" hollow core for the two new 222 room three story barracks and one new 150 room barracks, plus a 40 room two story addition to an existing barracks. The use of a precast concrete plank floor system helped satisfy both the fast track construction schedule and tough budget requirements. In this first phase, the masonry and precast work was completed in January and February of 2006 in upstate New York, where winter can be very harsh (...like a recent 11' snowfall nearby ...). Thanks to Mark Rebich, P.E., LEED A.P., Principal/Project Manager from Beardsley Design Associates for help with this article.



8" hollow core plank designed for blast loading

Photo by Beardsley Design Associates



Tented project to allow winter construction of masonry

Photo by Oldcastle Precast

Congratulations to:

- LaBella Associates, PC on their merger with Stuart I Brown Associates
- TVGA Consultants on their 90th Anniversary
- NPCA Quality Award of Excellence to The Fort Miller Company (fourth consecutive year)
- NPCA 5 years continuous Certification – Coastal Pipeline Products, Zeiser Wilbert Vault
- NPCA Creative Use of Precast Award, Habitat for Humanity Housing Development, Oldcastle Building Systems
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Precast Concrete Association of New York, Inc.
2829 East Avenue
Rochester, NY 14610
Tel: 585-249-9564 • Fax: 585-381-0945
Email: pcany@aol.com • Web: www.pcany.org

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New PCANY Officers Elected at Annual Meeting

At the January winter meeting, a new Board of Directors was elected to serve for the next two years:

President – Tom Montalbino, Roman Stone Construction

Vice President – David Wan, Oldcastle Precast

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Past President – Scott Harrigan, The Fort Miller Co.

Contact PCANY if you wish to receive a full report of the meeting.

Seminar on Parking Structures

Note the date change

APRIL 17

This ACI/PCI full day seminar is now entitled “Design, Build, and Maintain Concrete Parking Structures”. Seminar topics include: Design and Material Considerations; Requirements for Durability; Design Benefits, Materials, and Construction Considerations; Maintenance for Durability; Innovations in the Concrete Parking Garage Market. PCANY members receive a discount of \$140 from the \$567 registration fee. 7.5 PDH’s will be awarded.

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