

PCANY MONTHLY NEWSLETTER

PRECAST CONCRETE ASSOCIATION OF NEW YORK, INC.

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Focus of This Issue: Building Systems, Hollow Core

360 State Street

A new mixed-use 32-story building is nearing completion in downtown New Haven, CT. Fronting on State, Chapel, and Orange Streets, the \$189 million project will contain 500 apartments (including 50 affordable units), retail space, including a grocery store, a parking garage, and an early childhood education center. With a gross area of around 700,000 sf, the upper 26 levels (15,700 sf each) are constructed of 8" hollow core plank, supported on a staggered steel truss frame.



Aerial View (zoomed) – Rendering by AMD

This project will revitalize a long underutilized 1.5 acre site in a prime downtown location, a block away from the New Haven Green and across the street from the State Street train station. It is believed to be the largest private new construction project ever built in New Haven and the greenest large-scale residential building in Connecticut.

This project has been selected to be a pilot project for the LEED Program for Neighborhood Development, and will include such green features as geothermal wells, photovoltaic arrays, recycled and local materials, and fuel cells. [for complete information on the LEED-ND pilot program, go to www.usgbc.org/ShowFile.aspx?DocumentID=2845].

The plank on the project is furnished as 'carpet ready', suitable for direct pad and carpet application. All plank is 2-hr. fire rated, and the steel is fireproofed with spray on and wall board. Plank bottoms will receive a light textured finish, and become finished ceilings.



Mechanical openings thru plank, staggered truss support

Project architect is Becker & Becker, Owner is Becker Development, Engineer DeSimone Consulting Engineers, plank and photos by Mike Weigand, J.P. Carrara & Sons.



Plank partially erected on level 30, precast wall panels close behind

Support Our Troops – Fort Hamilton Army Reserve Center

Fort Hamilton provides services and support to the military personnel in the New York area. The new Reserve Center will greatly increase Fort Hamilton’s capabilities as a vital component to America’s military and national security and to New York City’s frontline defense. The project includes a 123,000 sf reserve center and a 3,500 sf maintenance training building. The new facilities include classrooms and arms rooms, providing units with a modern and revitalized environment that will support the National Guard units and active duty personnel.



The precast concrete panels featured recessed thin brick coursing and water table bands. The precast concrete load-bearing architectural panels were also designed to meet blast requirements as well as contribute to LEED Silver certification. Oldcastle Precast Building Systems manufactured 227 panels. The continuous insulation in the 10-inch thick panels exceeded ASHRAE standards by 50% with their R-value of 20.

Panel Sizes: Shipping and handling constraints generally limit the size of precast panels to about 12 feet high and 40 feet long. Outside the precast industry, factory-constructed building elements that large are rare. Tremendous economies can be achieved in building design by the use of large and repetitively-designed precast wall panels.

Opening Sizes and Locations: Opening sizes are usually determined by the desired architectural effect of the designer often using standard window and door sizes. It is important to place openings in locations where the structural integrity of the panel is not compromised during shipping and handling, generally a minimum of 8 inches from the edge of the panel.

Thanks to David Wan, Oldcastle Precast, for this article and the photos.

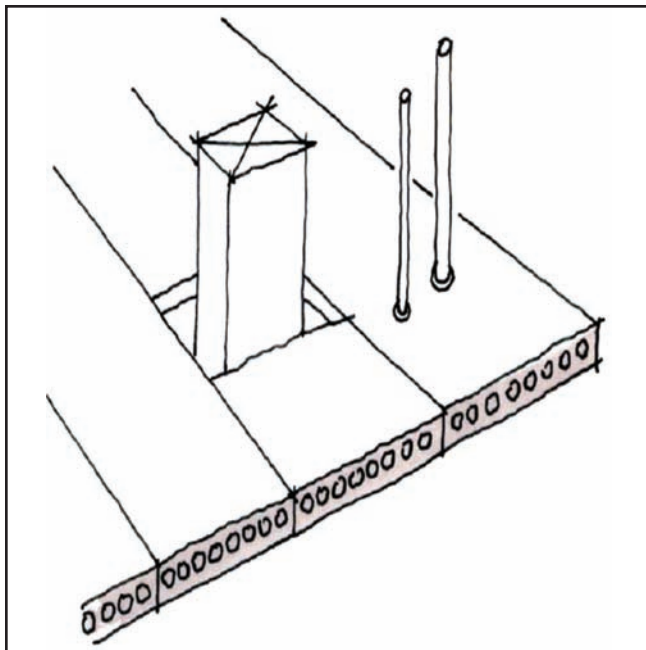
HOLLOW CORE FLOOR & ROOF SYSTEMS

PENETRATIONS

Hollow core plank floors and roofs typically require penetrations of vertical mechanical and electrical systems as well as other equipment and functions. Round holes are generally the responsibility of the General Contractor, whereas larger openings can be provided by the plank supplier. Cutting through strands of plank requires the approval of plank supplier.

Round holes up to one-inch diameter can be drilled with readily available carbide tips using hand-held drilling equipment. Larger round holes are usually cut with diamond-bit core-drilling equipment. Drilling at the center of the core is easiest because the core walls are thinnest at top and bottom.

Openings larger than ten inches are usually cut with a hand-held saw or a walk-behind concrete saw. The largest openings (mechanical shafts, stairs, etc.) are generally created by introducing a structural support such as a steel header or beam.



SPANS

The length of precast plank spans is determined by required loading capacity (generally set by applicable Codes), the width and depth of the plank, the number and size of steel strand (or wires) in the plank, and the depth of any concrete topping. The strand gives the plank the tensile properties for longer spans and higher working load capacities. As a rule of thumb, under normal loading conditions, plank thicknesses required for various spans are as follows:

- 8" Plank : 28' – 30' Span
- 10" Plank : 33' – 35' Span
- 12" Plank : 35' – 40' Span
- 16" Plank : 40' – 50' Span

CAMBER

Camber is inherent in all prestressed precast concrete products. It is the upward deflection in the plank created by the forces of the prestressed strands; and it is used to resist design loads. Planks with dissimilar lengths, strand patterns or openings adjacent to each other will have camber differences. Design professionals should obtain a clear understanding of the effect of camber during design of a project in order to determine appropriate floor finishes.

FINISHES

For ceilings, the underside of plank can be finished to provide a durable, low maintenance surface, often used in applications such as hotels rooms. The application of a medium- to heavy-textured material such as USG Imperial QT or equal, provides acoustic properties and an attractive finish. Care must be taken to follow the manufacturer's recommendations for application.

For floors, prior to receiving other finish materials (carpet, tile, vinyl flooring, etc.), the plank can be covered with a structural concrete topping (generally 2 inch, 4000 psi, steel mesh reinforced), or a concrete leveling material or a portland cement-based underlayment.

Precast, prestressed hollow core plank, for structural floor and roof applications, is the most widely used concrete product in the building industry. Whether used as part of a total precast building system solution or, independently, with other masonry and/or steel structural systems, hollow core plank offers high load-bearing capacity with superior acoustic and fire resistance properties.

The planks have continuous voids to reduce weight and cost and, at the same time, may be used for runs of mechanical or electrical systems. *(This page taken from 'Oldcastle Residential Building System', downloadable from their website, www.oldcastleprecast.com)*

PCANY MEETINGS FEBRUARY 1, 2010

We will hold a morning meeting of the Septic Tank Group, 9:30 to noon, and in the afternoon, 1:00 to 4:00 pm, we will hold our Association Annual Business Meeting. Both will be at the Turning Stone Resort & Casino in Verona, NY. Lunch will be available in the same room; please advise PCANY if you will be there for lunch (\$15.00). Meeting Agendas will be emailed in advance.

MAKE USE OF THE WEB ...

There is a world of information and assistance available on the web, and most PCANY members have a website address (available from the PCANY website, www.pcanyc.org). For instance, you can find a subject listing of our free lunch-box talks, or our listing of qualified tanks under the PCANY Septic Tank Certification Program. The PCI website has a downloadable paper on recommended practices for snow removal from parking structures, etc. etc. Let us know if we can help you with anything.

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