



# OPENING DOORS AND WINDOWS FOR GREATER PRECAST PERFORMANCE

## **New wall systems technology enhances designability, energy efficiency, and cost.**

THE WELL-KNOWN RATIONALE for precast concrete walls includes shortened construction schedules, thermal performance and life span. But design flexibility? Architects who want imagination to determine design, and not material constraints, often look past precast concrete. This is no longer the case.

A new manufacturing technology has replaced traditional processes which limited where door and window openings could be cast in hollow-core panels. The new VersaCore™ process allows Fabcon to cast-in openings that fit any architectural specification, providing design engineers and architects with a new range of building options. Enhanced design flexibility should win back architects and owners who are attracted to precast's fast-track schedules, low labor overhead and reduced financing costs, but often are forced to opt for components that offer more options.

## **Let in the Light: Manufacturing Moves from Pea Gravel to Foam Billets**

A U.S. Department of Energy report on windows and daylighting shows the glass surface area in a typical building has increased by 25 percent during the past 20 years. Window openings also are moving away from standardized dimensions to custom shapes and sizes. With today's commercial buildings becoming more transparent, design architects expect to configure window and door openings at will.

Architects specifying building materials for projects with aggressive window or door openings often explore options beyond non-composite precast concrete panels because of restrictions on forming (or casting in) openings on the production line. Fabcon's 12-inch non-composite precast concrete wall panels traditionally have been composed of an 8-inch hollow-core layer of concrete, a 2.5-inch layer of insulation, and a 1.5-inch solid layer of concrete. Precast manufacturers employ a number of techniques to produce the hollow-core layer. The Fabcon process involved pea gravel poured into the hollow

areas to keep the concrete from collapsing while wet. After the concrete cured, Fabcon tilted the panels up, which emptied the gravel and left the hollow cores.

Extrusion equipment required by this process prevented manufacturers from casting in spaces larger than small reinforcement plates. Instead, contractors cut door and window openings – at several hundred dollars each – on the job site. Cutting windows and doors on site can increase construction costs by \$20,000 to \$30,000 per project. In addition, some amount of pea gravel inevitably remained inside the panel, which increased weight and shipping costs.

The proprietary Fabcon VersaCore technology overcomes the problem by adding insulating foam on the production line. Expanded polystyrene (EPS) foam billets inserted directly into the wet concrete eliminate the need for extrusion equipment and allow Fabcon to cast door and window openings anywhere in a panel. Also, because the foam billets stay in the panel, core construction is more consistent and predictable.

With recent automated technology, Fabcon has further eased the problem of cutting windows and doors. Through their proprietary laser machine, they are able to accurately cut windows and doors with a tolerance of plus or minus 1/64 of an inch. With tighter tolerances, Fabcon is able to provide a quality product to customers without raising prices.

Previous attempts to insert foam billets into hollow-core precast concrete panels did not succeed because manufacturers could not stabilize lightweight materials within a layer of wet concrete. VersaCore technology keeps the foam from floating during manufacturing, counterbalancing the density difference between the foam and concrete.

## **Precast Concrete Complies with both Architect and Owner Demands**

Heating and cooling costs typically represent approximately 32 percent of a building's operating budget. As this cost is multiplied over the average 10-to 20-year ownership period, energy expenses rank as a high-priority lifecycle issue. This issue



is even more significant for multiple-facility owners. VersaCore technology results in a higher R-value rating than previous insulated Fabcon panels.

The high-density cell structure of the foam increases the energy efficiency performance of the VersaCore panels, bumping precast concrete's already high insulating ability up by 30 percent. Foam increases the R-value of a Fabcon 12-inch insulated panel from 12.78 to 16.4. This compares to a precast industry R-value average of 10.

Architects determined to maximize the lifespan of their buildings look toward precast concrete for high structural integrity, durability and low maintenance requirements. The manufacturing process advance means that precast concrete panels become a viable and smart choice for a broader range of projects. Adding design flexibility that is on par with other materials and methods enables precast to compete head-to-head with options not as strong in shortening build schedules, cutting construction costs and even reducing operating expenses over the long term.

*For more information about the advantages and benefits of precast concrete panels, call Fabcon at 1-800-727-4444.*