

## The Conquest of Space

Thin-shell precast concrete has scored a victory in the conquest of space—inner space, that is. Floor space was added to the Domus residential complex in Philadelphia

and turned to thin-shell precast concrete cladding to speed erection. It selected Metal Stud Crete, a thin-shell precast concrete wall system that marries 2.5-inch faces of architectural

used medium sandblasted finish to reveal aggregates, and an acid etch.

The light weight of thin-shell precast made panels as large as 35x14 feet practical. Fewer and bigger panels meant faster erection, satisfying Hanover's desire for speed. The largest panels were shipped on slanted easels to comply with highway height and width limitations.

Metal Stud Crete panels also saved money. For example, IECS designed a horizontal concrete beam that was cast integrally with the panels. The innovative beam seals the wall against floor-to-floor fire migration. Normally, the contractor would have had to add a firestop after erection.

Perhaps the most important gain was in curb appeal. "The precast concrete finish is spectacular," says architect Mike Goodwin of The Design Collective, of Baltimore. In the original masonry plan, the wealth of detail was too expensive to execute on all but the most visible facades.

But with thin-shell precast, beautiful detail on four walls cost no more than on two. "We were repeating what the formwork was already doing in the rest of the building," explains Goodwin, who believes thin-shell precast improved his options on all walls. "We were able to do some very nice moves, unique to the thin-shell system, that we couldn't afford with masonry."

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home maintenance, such as painting, staining, weatherproofing, or aluminum cladding. Resistance to fire and natural disasters such as tornados, earthquakes, and flooding are benefits.

2. Variety in architectural finish. Numerous architectural treatments are possible with precast concrete. Many high-quality surface textures, colors, and finishes are available with precast plant production methods. Permanent brick and "stucco" exterior finishes offer even more options for architectural designs.

3. Sustainability and environmental friendliness. Precast concrete is an environmentally friendly or "green" material for construction. The thermal mass of concrete and the high insulation efficiency of precast concrete save non-renewable energy resources through lower fuel and electric costs. Also, a precast concrete envelope maintains steady indoor comfort.

4. Open, flexible design. Concrete home framing establishes long open spans with loadbearing external wall panels, eliminating the interior support walls and columns of conventional wood construction and creating unobstructed interior spaces. This allows for maximum flexibility in interior design options and offers homeowners creative room layout potential, with minimal structural restrictions on future remodeling. It is possible to achieve ceiling heights of 10 feet or more at virtually no additional cost.

5. Lower long-term maintenance costs. Because precast concrete exteriors maintain their just-built look with little maintenance and their operating costs are much lower than those of a conventional wood house, the concrete building retains high resale value over time.

### Sandwich wall panel

The NU sandwich wall panel is both a totally composite and a fully insulated system. The NU Concrete House incorporates a sandwich wall panel consisting of two relatively thin concrete wythes and an in-between layer of insulation. During its manufacture, the insulation is placed to produce full structural composite action as well as establishing an uninterrupted thermal barrier between the wythes.



The backside of the precast Metal Stud Crete panels show the cold-formed steel stud framing used to support the 2 1/2-inch-thick precast concrete face. Metal framing provides space for utilities and insulation.

by switching its cladding to a thin-shell precast wall system. This also helped the developer get its buildings enclosed faster, reduce project costs, and improve its architectural appeal.

The \$71 million project in University City in Philadelphia is being developed and built by The Hanover Company of Houston. The eight-story complex includes 414,000 square feet of premium residential and retail space, plus 108,000 square feet of parking. The project was originally designed with a masonry finish with complex brickwork to harmonize with the brick facades of the adjacent University of Pennsylvania.

Groundbreaking was scheduled for December 2005, and the developer was anxious to have the building enclosed and watertight before winter. Hanover revised its plans

precast concrete to cold-formed steel stud framing using a proprietary connector embedded in the concrete.

### Saving space

To make the change, Hanover brought in IECS of Warrenton, Va., an engineering firm with previous experience with Metal Stud Crete. Thin-wall precast, "saves quite a bit of space" because the studs provide built-in cavities for utilities and insulation, eliminating the need for an additional furring wall, says Michel Catteau of IECS.

Architectural Precast (API) of Middleburg, Pa., produced the panels. In addition to complicated brick patterns and reveals, as many as three different colors were required on some panels. To harmonize with the masonry on the university campus, API emulated the appearance of limestone,