

Hollow-Core Help for Housing

Q How can I install a radiant-heating system in my floor assembly using precast concrete hollow-core?

A. Installing a radiant-heating system along with hollow-core units helps offset energy price increases while enhancing environmentally friendly design.

Precast concrete units can serve as a radiant-heat source that is more comfortable and more efficient than forced-air heat. In-unit hydronic heaters warm the living space from the floor rather than from the ceiling down.

With the automated manufacturing process used for hollow-core, it is easier to install these systems in the field. Tubes are inset into the concrete topping applied to the units. Insulation is provided to reduce heat loss around the hollow-core edges. The tubing layout is secured, and the concrete is placed.

The heat source can be any boiler, water heater, or solar collector to provide a warm-water source. Most hydronic-system manufacturers have software to design the layout of the tubing system, as well as to calculate heat loss.

No special concrete topping is required. As long as the tubing is protected during placement and a 2-in.-clear cover of concrete is maintained, the topping and hollow-core placement construction can be completed as if no tubing were present. Ideally, the tubes should be charged with water during placement to avoid crushing.



Q Do I need topping when specifying “carpet ready” for hollow-core systems?

A. Hollow-core units are prestressed products and will have camber (upward deflection) that can require topping. But in situations where differential camber can be controlled, some hollow-core systems can be carpet ready after only sealing the joints between the units.

The design and layout will affect how much variation there will be between the hollow-core units. Hollow-core spanning in opposite directions will have more variation. Special attention should be given to areas around doors to obtain proper finished elevations.

For other hollow-core systems, a $\frac{3}{4}$ in. gypsum topping should be considered. Cement-based toppings can also be specified. For composite structural toppings, a minimum thickness at midspan should be 2 in., and for nonstructural toppings, the minimum should be $\frac{1}{2}$ in.

For more details, refer to PCI's *Manual for the Design of Hollow-Core Slabs*, 2nd edition.

More Information

This column answers frequently asked questions about designing, casting, and erecting precast concrete components. This issue's responses were provided by the Mid-Atlantic Precast Association (www.mapaprecast.org) and by PCI of Illinois and Wisconsin (www.pci-iv.org). If you have a question about precast concrete components, please send it to Executive Editor Brian Miller at bmiller@pci.org.



Photos: Courtesy of Spancrete.

In situations where differential camber can be controlled in hollow-core components, they can be carpet ready after only latexing the joints between the units.