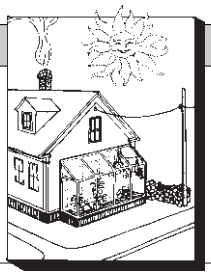
Insulated Foundations Made Easy

by Alex Wilson



Building insulated poured-concrete foundations can be a big drain on time and energy. Along with the typical tasks that go with forming and pouring foundations—caring for the forms themselves, smoothing rough concrete edges, waterproofing, etc.—you need to install the insulation in a way that protects it from damage.

It's no wonder that foundations are often considered the worst phase of a building project. And it's no wonder that they are seldom insulated to appropriate standards. Often, they are not insulated at all.

Four products are out on the market—two for full foundation walls and two for slabs—that aim to make this process easier. More than that, they claim to provide more strength, fewer voids to invite woodboring insects, and much better insulating value.

Crete Core Insulated Block System

I first saw this product in New Mexico some eight or ten years ago, and the builders there were raving about it. For the last five or six years, it has been produced in upstate New York (under a different name) and shipped throughout the Northeast, with about 1,000 systems currently going in per year.

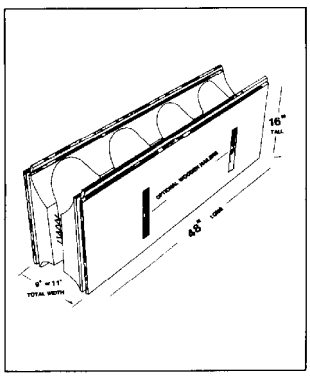


Figure 1. *Crete Cure foam blocks are held together with wire mesh. Optional wooden nailers allow temporary bracing and permanent installation of interior and exterior wall finishes.*

Crete Core is an EPS (expanded polystyrene) block, 48 inches long by 16 inches tall by 9 or 11 inches deep. Each block has four cylindrical cores which, when filled with concrete, provide equivalent strength to a 6- or 8-inch-thick concrete wall. The sides of the block are held together with wire mesh as shown in Figure 1. All edges are tongue-and-groove so that the blocks can be stacked. And, unlike the product I saw in New Mexico, 2x2 nailers can be inset at the factory (on one side or both) to simplify drywall installation. The insulating value for the finished system is about R-22.

Crete Core can be used for foundation walls, or for complete above-grade walls in residential and light commercial buildings, taking the place of concrete blocks. With the recommended 3,500 PSI, 4-inch slump concrete, the full walls for a single-story building (below and above grade) can be poured in one day, pouring 4 vertical feet at a time and moving around the building. The 1.5 pounds-per-cubic-feet EPS provides good strength. The primary drawback seems to be the bulkiness of the blocks and the fact that foundation contractors are scared off by it (with good reason, as such products could greatly reduce the need for their services).

Cost for the Crete Core blocks is about $1.80 to $2.00 per square foot, depending on thickness and nailers (higher if shipping distance is considerable). Including concrete at $56 a yard, insulated foundation cost is $2.80 to $3.60 per square foot plus labor. In comparing the cost with conventional poured concrete foundations, you need to figure in the labor, which will be much higher with conventional systems—that's where Crete Core and the other products covered here really pay for themselves.

RVG Thermal Wall System

The Thermal Wall System (Figure 2) is similar in many ways to Crete Core. The primary difference is that you assemble the blocks on-site using high-strength plastic ties. The ties come in different lengths allowing you to choose the desired wall thickness—or change it, in going from a foundation wall to an above-grade wall, for example. The ties double as anchors for screws when installing drywall or paneling. The interlocking side panels are 40 inches long, 12 inches high and 2 inches thick. The system produces a wall with about an R-20 insulating value.

RVG uses a high-density (2 pounds-per-cubic-foot) EPS in the Thermal Wall System, so the product performs more like extruded polystyrene than standard l-pound beadboard. Also, and perhaps more importantly, because the forms are put together on-site, they can be shipped and stored more easily than the full blocks provided by Crete Core. However, you will pay for this advantage—cost is about $3.00 per square foot, half again as much as Crete Core. Thermal Wall System still works out to be less expensive than a conventional poured concrete foundation, though, especially when interior finish is factored in.

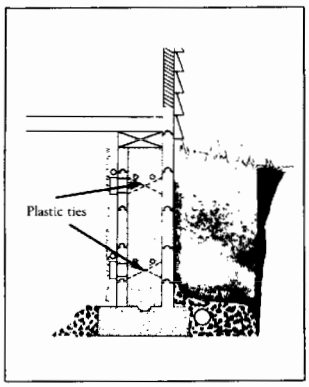


Figure 2. *RVG's Thermal Wall System uses foam blocks that you assemble on-site, using high-strength plastic ties. The ties double as anchors for screws when installing drywall or paneling.*

Branch River Fast Form

Branch River's Fast Form is an exciting new product for forming and insulating around the perimeter of slab-on-grade foundations. The forming blocks, made out of l-pound-per-cubic-foot density EPS, are set on tamped gravel in the perimeter trench (which only needs to be 12 to 14 inches wide). Re-bar is held in place with special foam clips, double 2x4 sills are set in place on a specially formed shelf, and a monolithic concrete pour provides both frost walls and slab.

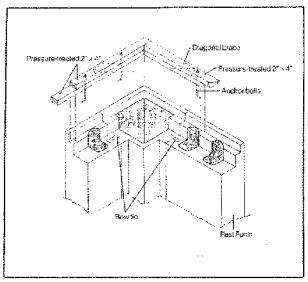


Figure 3. *With Fast Forms, concrete is poured into an assembled EPS form, to create separate columns. Forty percent less concrete is used than with conventional poured foundations.*

As shown in Figure 3, Fast Form results in separate concrete columns extending up from a continuous concrete footing and tied into the continuous slab, with EPS holding the system in place. At corners, a much wider pillar of concrete is created. Fast Forms are shipped in 1x4x8-foot sections, and sections are joined with special EPS ties extending the full height of the frost wall. If working around ledge, Fast Forms can simply be cut away at the contour of the ledge—much less time-consuming job than when using standard forms. The system produces an insulating value around the perimeter of R-29 with a cost of about $15 per linear foot of slab perimeter.

Gentrex System 150

The Gentrex Corporation of Lancaster, Calif., has recently introduced a one-step outer concrete form and insulation system, which includes an insect barrier and a rugged exterior PVC protective skin. Special PVC butt joint connectors and corner assemblies tie intersections and corners together. A concrete lock, formed into the System 150, (Figure 4) assures a tight bond between concrete and insulation.

System 150 is made of extruded polystyrene (Dow Chemical Type SM Styrofoam). Forms are 8 feet long, up to 24 inches high and 1½ inches thick, providing an insulating value of about R-7.5. Forms up to 2 feet high can simply be staked in place for pouring, although it may be a good idea to at least hang the forms inside 2x12s. For deeper frost walls, more than one System 150 will have to be used, joined by horizontally installed PVC butt connectors. For frost walls higher than 2 feet, forms will be required to hold the permanent insulated forms in place.

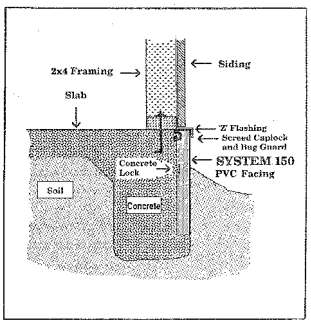


Figure 4. *Like the other systems, Gentrex's System 150 uses foam. But it comes with a PVC "skin" to protect it from damage and eliminate the need for painting or other types of coverups.*

Material cost for the 2-foot-high System 150, not including concrete and labor, will be about $3.50 per linear foot. Labor costs will be much less with this system than with conventional forms, and, according to the company, concrete waste will be reduced. Savings will also be realized (over the other products covered here) by not having to stucco the polystyrene. According to the manufacturer, the PVC coating provides that protection, and it can simply be painted with an exterior latex paint.

Less Labor, Lower Cost

What all these products share is a greater margin of control by the builder. With any of these, you can do the formwork yourself, eliminating the sub. In fact, Dean Gardener developed Gentrex's System 150 when, as a builder, he became frustrated with dealing with foundation contractors. Branch River's product was also developed in direct response to needs expressed by builders.

With the labor savings provided by these products, you end up getting the insulation almost for free. With more attention now focused on foundation heat loss, these products are bound to gain rapid acceptance.

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