

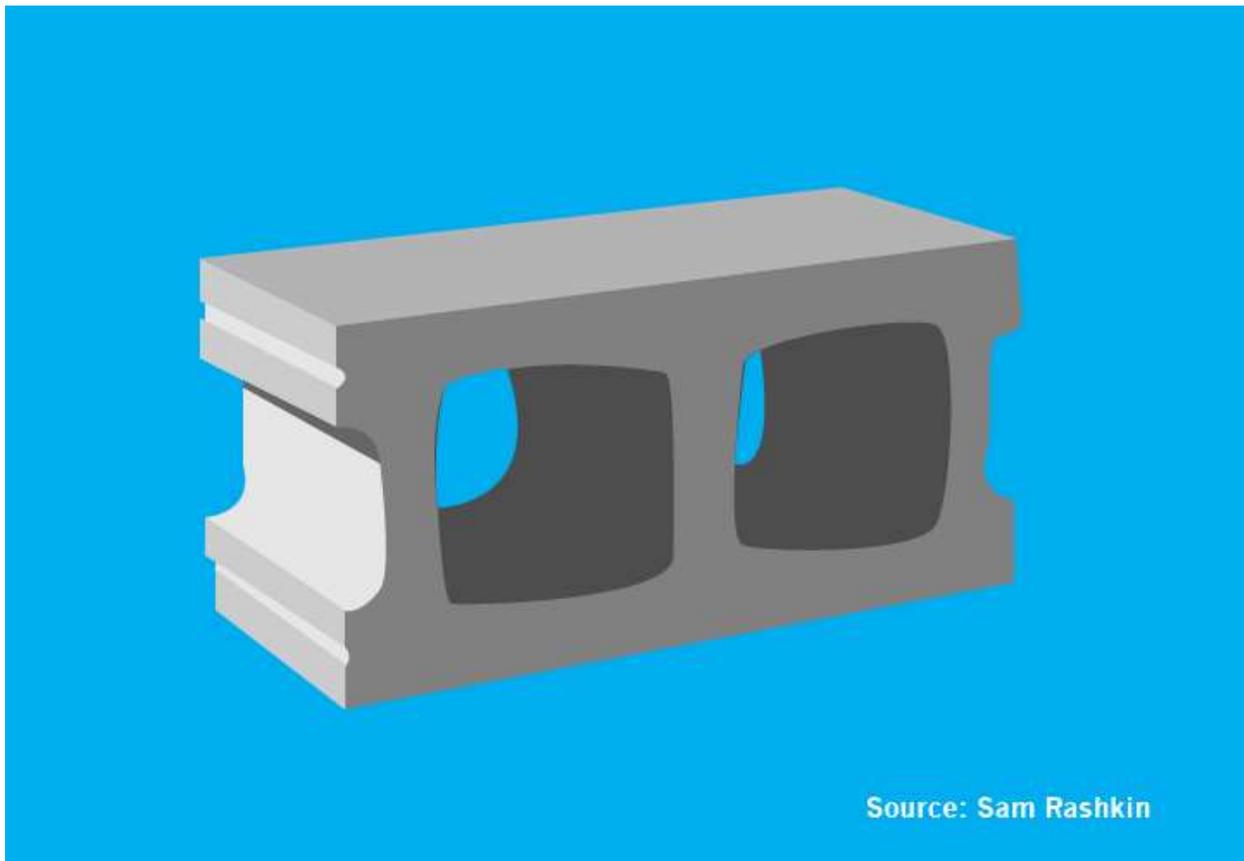
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ICP Building Blocks for Starters

It's time for builders to change platforms:

Part 4 – insulated concrete panels

Sam Rashkin – Founder, **Retooling the U.S. Housing Industry**



Here we go again. It's time for another look at an advanced technology sitting on the shelf that has the opportunity to break a virtual 150+-year gap in significant home framing innovation (see [Time to Change Platforms](#)). And this alternative, insulated concrete panels (ICPs), represents a complete platform change from traditional wood framing. With this technology, concrete is poured in the field into prefabricated panels composed of two layers of expanded polystyrene insulation board and reinforcing

(see Figures 1 thru 4). This is a big innovative jump from its predecessor technology, insulated concrete forms (ICFs) where factory-made expanded polystyrene blocks are stacked in the field, reinforcing is inserted into the voids, and then concrete is poured into the voids. Think of something like the inverse of traditional concrete block construction. Although ICFs result in a very high-performance wall for both above and below grade construction, the technology remains so labor intensive and costly, it has been limited to a niche market status. Now, ICPs are positioned to fix the labor and cost problems and enable concrete wall technology to go mainstream as a serious challenger to traditional wood framing.

And why not? Consider the attributes of wood as a construction material. It burns incredibly easily; rots when wet, is eaten by insects, has poor dimensional stability, offers minimal impact resistance, and provides no thermal storage capacity. Now consider the attributes of concrete as a construction material. It is noncombustible, moisture resistance, insect resistant, dimensionally stable; impact resistant; and excellent thermal storage. This leads to the following ICP value propositions that can not be matched with traditional wood framing:

- **Superior Construction:**
 - ❖ Much faster construction time
 - ❖ Less tools for assembly
 - ❖ Substantially reduced enclosure subcontractor work (e.g., framing, insulation, air sealing)
 - ❖ Superior moisture protection
 - ❖ Substantially less waste
 - ❖ Superior quality fit, finish, and trim
 - ❖ Smaller heating and cooling systems due to substantially reduced loads and outstanding control of mean radiant temperatures

- **Superior Performance:**
 - ❖ Superior strength
 - ❖ Superior wind resistance
 - ❖ Superior fire resistance
 - ❖ Superior quiet
 - ❖ Superior dimensional accuracy that makes everything else easier to install
 - ❖ Superior energy performance with minimal thermal bridging
 - ❖ Superior quality installed insulation (e.g., no gaps, voids, compression, shrinkage control, settling control)
 - ❖ Superior air-tight assembly
 - ❖ Superior thermal storage to help buffer homes from overheating
 - ❖ Superior moisture storage to buffer the home from moisture related issues

I know this impressive list of advantages looks similar to previous articles. But they are important to highlight to ensure full accounting of all cost debits and credits with new platforms like ICPs. And like the other options, this includes substantial relief from what is so often cited as the biggest challenge for home builders: finding reliable, skilled, and affordable trade partners.

Now for the big news story. One of our nation's largest home builders, Meritage Homes, is making a significant investment in ICPs. They are beginning slowly to work out the kinks and lock in lessons-learned before employing in large-scale projects. According to CR Herro, Vice President of Environmental Affairs at Meritage, they plan to construct about a dozen spec homes in Orlando this fall along with another dozen in Phoenix. Then full subdivisions employing ICP technology should begin in March of 2017. Meritage is using an ICP product made by a company called HerculWall®. Here is a short description of this system from their web site:

“HerculWall® panels are manufactured in a factory environment on computer controlled equipment to exactly match the architectural plans for a specific project. HerculWall® is delivered to the job site as a kit of numbered panels that are set up in numerical order forming the exterior wall according to the construction documents. The HerculWall® kit includes corner panels, straight wall panels and window and door panels. The panels are manufactured to exacting standards limiting variables and facilitating labor efficiencies. No cutting, sawing or other job site modification of the panels is required. No job-site scrap is generated. After the wall panels are installed, concrete is placed within the panels utilizing a grout pump. After the concrete has cured construction continues.”

This is a truly profound paradigm shift in construction technology rarely seen with large national publicly-traded production builders. Meritage Homes is certainly taking a bold step as an innovation leader. I recommend the rest of the housing industry watch closely. Again, I am not associated with or financially linked to any product, technology, builder, or manufacturer. I'm simply a long-time industry observer asking hard questions why so many compelling new technology solutions are so slow to be embraced when they offer so many solutions and benefits to the housing industry. This one solves so many problems and addresses so many business risks, it certainly has my attention.



Figure 1: Lightweight panels easy to handle in the field



Figure 2: ICP walls assembled ready for finish



Figure 3: Numbered panels for easy assembly and raised heel construction



Figure 4: Electric wiring easily cut into foam panel

*This article is part of a series on housing innovation based on the author's book, **'Retooling the U.S. Housing Industry: How It Got Here, Why It's Broken, and How to Fix It.'** This book examines opportunities to transform the homebuyer experience relative to five key components: 1) Sustainable Development, 2) Good Design, 3) High-Performance, 4) Quality Construction, and 5) Effective Sales. Each article features one innovation or business principle covered in workshops with builder executives. Find out how to participate in one of these workshops at www.SamRashkin.com.*