

A NEW Bridge for ICF Construction and the Door and Hardware Industry

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THE GROWTH AND CHANGES OF Insulating Concrete Form (ICF) construction have remained off the door and hardware industry's radar, and this is mainly because—until now—it has had no reason to pay attention. Integrated Framing Assemblies (IFAs), a new solution for door and window openings on ICF projects, are changing that, however. Their design coordinates multiple trades at ICF door and window openings at the early stages of pouring and curing of the concrete walls. One of the trades an IFA coordinates at this stage, and thus its pertinence here, is door and hardware installation. First, however, a brief introduction to the ICF industry is necessary as background.

Insulating Concrete Forms (ICFs)

ICFs are a method of constructing pour-in-place concrete walls.¹ Technically, the insulating concrete form is a block consisting of two foam panels facing each other with a cavity in the middle being spanned by some form of webbing. The foam is typically either expanded polystyrene (EPS) or extruded polystyrene (XPS). Each block is stacked on top of another until the desired size of the wall or wall section is accomplished. Rebar is threaded through the webbing between the panels, and then concrete is



poured into the cavity. Upon curing, the insulated panels remain as an outer shell of the concrete wall on both the exterior and interior. In addition to superior structural strength, this construction method provides superior insulation, and in some residential projects means that no further insulation (such as blown fiberglass) is needed. ICFs are also green building products that contribute LEED points to projects, since they reduce energy costs.²

ICFs have historically been a residential phenomenon, with their combination of insulation and structural strength making them popular in cold-weather climates as well as warm-weather (hurricane-prone) areas.³ Their growth into the commercial domain has increased steadily, however, and one ICF trade magazine forecasts 42 million ft.² of commercial ICF construction for the current calendar year of 2008.⁴

ICF Door and Window Openings

One challenge for ICF builders, which is relevant to the door and hardware industry, has been maintaining door and window opening integrity during the transitions from concrete pouring to door, window, and hardware installation. Previous methods of handling door and window openings have been unnecessarily labor- and time-intensive.

▲ An IFA jamb, with angled alignment flange, and ICF block, awaiting concrete.



▲ IFA doors installed prior to concrete pour at Joseph Warren Middle and High School (Bowling Green, KY). Note IFA windows in background.

▼ Specialty IFA reflecting traditional hollow metal capabilities—including glazing, mullions, and hardware preps—anchored into footer and ICF wall.

On a typical ICF project, when builders are laying ICF foam block, they will block out, or “buck,” the door and window openings. Various materials exist for accomplishing this task, ranging from hand-made wood “bucks” to vinyl and light-weight steel “bucks.” Adding bracing to the opening to provide strength, builders then pour around the opening into the foam form. Once the concrete has cured, they then return to each opening in order to install door and window frames. Often, an opening will have shifted during the pour and/or curing of the concrete and the contractor will need to give it further attention in order to assure that it is plumb and straight. Once the builder installs frames, he or she must prepare them to receive doors and hardware. Finally, the doors and/or hardware are installed in the opening.

Integrated Framing Assemblies (IFAs)

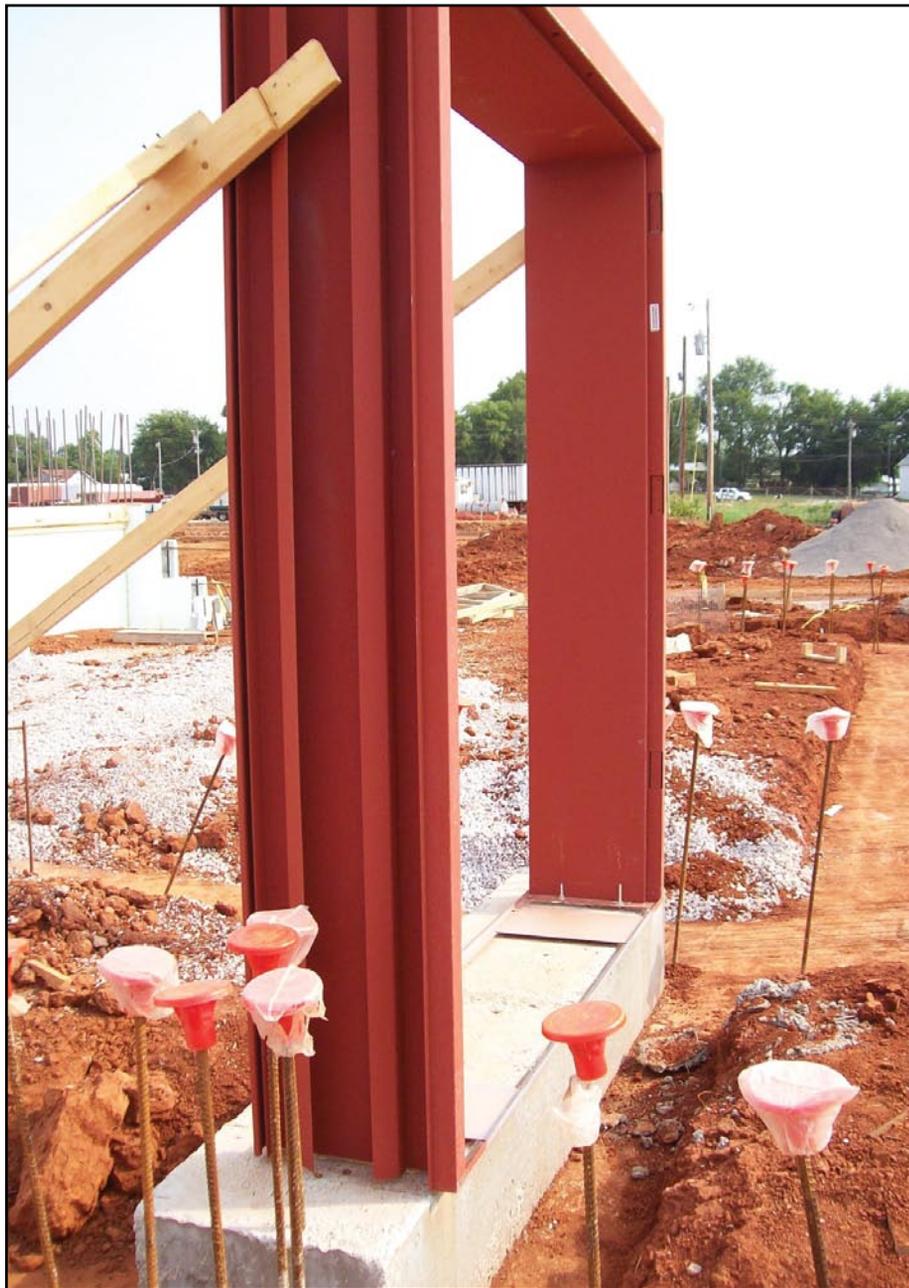
The treatment of door and window openings on ICF projects is relevant for the door and hardware industry because



Joseph Warren High School/Middle School, Bowling Green, KY, photo by Stala Integrated Assemblies, LLC

IFAs streamline the entire aforementioned process.⁵ Installed prior to pour, these assemblies are 14 gauge galvanized steel frames that serve as the buck for the opening. Each frame is custom-made to the architect's specifications for that opening and shipped to the job-site already hardware-prepped. Thus, upon the curing of the concrete, the opening is ready to receive a door or window.

▼ 60x70 door opening IFA. Note hardware preps in jamb.



(Joseph Warren High School/Middle School, Bowling Green, KY, photo by Stala Integrated Assemblies, LLC).

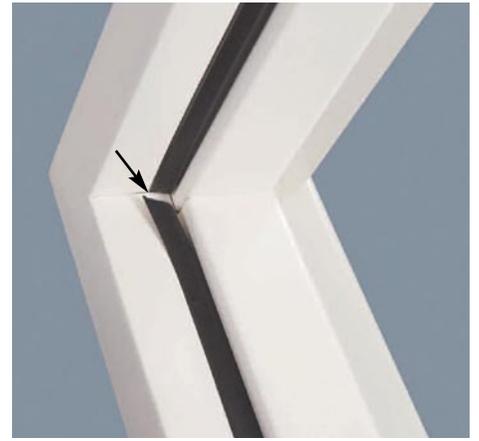
Furthermore, beyond the time savings IFAs provide, they also offer a more energy-efficient solution to door and window openings. Their design includes an angled alignment flange on the concrete form side of the frame jamb. Concrete is poured into and around this flange, and thus, when the concrete sets, the framing assembly is literally part of the concrete form. The result is a more tightly-sealed building

envelope that facilitates lower energy costs.

Implications for Doors and Hardware

IFAs are designed to work with any brand of ICF block, and those in the ICF industry who have seen them in the field are already noting the success of their innovative solution to the problem of door and window openings. Paul Camozzi, Senior Account Manager for Amvic Building Systems, has been in the ICF industry for over a decade and frequently conducts technical training sessions. According to Camozzi, "The hiccups for ICF construction have always been floors and bucks." Regarding the latter specifically, he says, "How do we do doors and windows?" is easily among the top 10 questions builders ask. IFAs now address commercial buck requirements. They dramatically facilitate in-field installation and professionally address architects' concerns over important window and door assembly details." Similarly, Martin Clark, the Commercial Accounts Representative for the Public Sector for the Nudura Corporation, which produces Nudura ICF block, has recently praised IFAs' facilitation of ICF construction: "Every architect I talk to says this is the solution for door and window openings on commercial projects."

As IFAs continue to appear on commercial ICF projects, then, there are implications for door and hardware estimators, suppliers, and installers who are involved with these projects. The most obvious implication, given the collapsing of a multi-week or even a multi-month construction process into one installation stage, is that



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contractors need earlier job-site delivery of doors and hardware. A second and related implication, then, is that IFAs allow earlier job-site lock-up since doors and locks can be placed in frames as soon as the concrete sets. This provides earlier and additional security for the job-site, with less chance of tool and supplies theft, etc. Third, with each opening not requiring continued checking, re-checking, and further prepping, installers see lowered time and labor costs. A fourth implication involves IFAs' appearance in architectural specifications. Thus far, architects have placed them in a modified division 8; that is, in door and hardware territory.

These are some of the manners in which IFAs are currently affecting the door and hardware industry. Other possible affects are also on the horizon. For example, depending on the needs of the ICF industry and new applications of IFAs, the assemblies may eventually require hardware specifically designed for their system. Even without this possibility being a current reality, however, it is clear that IFAs are already providing a bridge between the ICF industry and the door and hardware industry. 

About the Author: *J. Andrew Keith (MBA, AHC, CDC, CSI) is President and CEO of The Atlas Companies. A graduate of J. B. Speed School of Engineering (University of Louisville), he has almost forty years of experience in the construction industry and may be reached via email at andyk@atlas-co.com. Chris Keith (PhD, University of Edinburgh, Scotland) works in the Research and Development Department at Stala Integrated Assemblies, LLC and may be reached via email at info@stalaframing.com. More information on IFAs can be found at www.stalaframing.com.*

Footnotes

1. For a fuller introduction than what is found here, see Pieter VanderWerf and Doug Drodge, "Specifying ICFs," *Construction Specifier* (July 2006): 70-78.
2. On energy savings, see Pieter VanderWerf, "Foam Forms Bring Concrete Results," *Home Energy* (July/August 1998): available online at www.homeenergy.org/archive/hem.dis.anl.gov/eehem/98/980712.html. Or, more thoroughly, Pieter VanderWerf, *Energy Comparisons of Concrete Homes versus Wood Frame Homes* (Skokie, IL: Portland Cement Association, 1997).
3. See, e.g., the ICF home in southern Mississippi that was left standing after Hurricane Katrina leveled the wood-frame houses surrounding it in "Concrete House Stands up to Katrina," *Nation's Building News* (December 12, 2005): available online at <http://www.nbnnews.com/NBN/issues/2005-12-12/Building+Systems/index.html>.
4. Clark Ricks, "ICF Industry Forecast," *ICF Builder* (December 2007/January 2008): 28-35.
5. For coverage of IFAs in trade magazines, see Tom Klemens, "Theme and Variations in Forming: Insulating Concrete Forms Make Sense—and Dollars, Too," *Concrete Construction* (March 2008): 45; Jay McNally, "ICFs Gaining Ground in Education: Integrated Steel Assemblies Speed Construction Time, Save Money," *Walls and Ceilings* (May 2008): available online at http://www.wconline.com/CDA/Articles/Feature_Article/BNP_GUID_9-5-2006_A_10000000000000317988.