SFIA
STEEL FRAMING INDUSTRY ASSOCIATION

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IMPACT OF ENERGY CODE CHANGES ON COLD-FORMED STEEL FRAMING

The impact on CFS framing would probably not top anyone's list of important consequences from the recent Presidential election. However, there may be reason for the industry to take note of the past, especially in relation to how the 2008 election influenced energy code requirements for building materials.

Up until the mid-2000s, energy codes changed slowly and incrementally. With a new administration that was viewed as a proponent of more stringent codes, things suddenly began to change after the 2008 election. Efficiency advocates were emboldened. Some of this may have been due to a feeling that the opportunity to make revolutionary changes to energy codes was finally here and may not have been for long. Some of it was a result of Federal dollars that started flowing to pursue advocacy and educational activities. In any case, substantial changes to the 2009 and 2012 International Energy Conservation Code (IECC) followed.

Should we expect a repeat with the upcoming IECC code change cycle that begins in early 2013? Probably, but the results will likely be less radical than the jumps we have seen during the past two cycles.

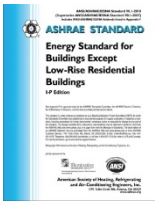
2009-2012 changes and their impacts

The most significant change in the past two editions of the IECC that impact CFS deals with the requirements for exterior continuous insulation. In the past, insulation went in the wall except in the most severe climates, where some additional but moderate amount of continuous exterior insulation (Often called foam insulation) was required. The new requirements mandate additional foam insulation on the outside of CFS walls in all climates and significant amounts of it in the more severe climates. Other materials face the same issues, but the impact is greater on CFS. Buildings in most climates will require anywhere from 1-1/2 to 2 inches of exterior continuous insulation depending on the type of insulation selected. The warmest climates will require less, and extreme cold areas more.

The impact on a wall assembly is significant. First, there is a higher cost for compliance for CFS walls versus wood, resulting in a competitive disadvantage.

Two Key Codes Govern Energy Design

The IECC is the International Energy Conservation Code published by the International Code Council. It is the most widely adopted energy code in the United States and serves as the base document for many states that develop their own energy codes. The IECC covers both residential and commercial buildings. It contains prescriptive and performance compliance options. It also references the ASHRAE 90.1 standard as a third compliance path. The latest version is the 2012 edition.



ASHRAE 90.1 is produced by the American Society of Heating, Refrigerating, and Air-conditioning Engineers. The 90.1 standard is frequently cited in Federal construction specification The 90.1 standard addresses the same scope as the IECC except it does not cover residential buildings three stories and less. The latest version is the 2010 edition.

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Second, on commercial buildings over one story, a fire test requirement according to NFPA 285 will be required to meet the building code. Although the foam sheathing industry is pursuing these tests, they have a way to go to cover all product types and thicknesses.

Third, methods to attach cladding will need to be developed, since siding and other claddings will be sitting further from the face of the wall and their fasteners will experience different loads than without the foam insulation. This is a critical design issue with heavy cladding materials on multi-story buildings that could threaten occupants or visitors walking below if not designed adequately.

Fourth, details will need to be addressed for windows, doors, corners, exterior light fixtures and other items that depend on access to framing that will not be as accessible with the foam in place. For example, there will not be a solid material or surface to attach a window flange without some changes to the fastening system or additional framing to compensate for the foam thickness. A similar situation exists for corner boards on siding systems.

Last, walls will be thicker and reduce interior space if the building footprint is not enlarged. In many cases, there is not room to expand the envelope footprint to make up this floor area. It has to come out of the useable space.

What's Next?

It is not likely we will see much if any drop off in determination by proponents of more restrictive energy codes in the next year or two. How the fiscal "cliff" issues in at the Federal level are worked out will likely have some influence, since it may impact the funding available for the Department of Energy to fund advocacy and other building code activities. However, we need to keep in mind under any scenario that the big push in the IECC to increase stringency during the last two cycles may have exhausted the benefits of simply requiring more insulation. There are rapidly diminishing returns to adding insulation at a certain point and we have reached that point in most climate zones. There will be proposals for even more insulation, but most of the emphasis will be elsewhere. Enforcement will likely be one of the next priorities.

Many contractors and designers will dismiss the thermal issues as not relevant to their location due the lack of an energy code or minimal enforcement in their area. This, too, will change.

In 2010, congress passed the American Recovery and Reinvestment Act (ARRA), sometimes referred to as the "stimulus" act. Deep within the ARRA requirements is a section that requires states to adopt the 2009 IECC and ASHRAE 90.1-2007 (a compliance option in the IECC for commercial buildings) Further, ARRA requires a 90 percent level of compliance. The definition of "compliance" is a sticking point that many states interpret in their own way. However, the net result will be energy codes like the IECC coming to your neighborhood soon, with aggressive enforcement thereafter.

The emphasis on enforcement will impact CFS buildings in several ways. First, those of you that have not had an energy code will need to consider how to incorporate continuous insulation into wall assemblies. In some southern regions, this will be the first time you may see foam insulation on the exterior of a building. The CFS industry, particularly suppliers and manufacturers, will need to make sure designers and contractors understand how to apply these products and address the cladding, openings, and other detailing problems they introduce.

Second, a designer's decision to use other framing systems that require less continuous insulation than CFS may be one you have to face. How do you get around this? One way is to work with the architect or owner early in the process to make sure they are aware of alternatives to the prescriptive R-value requirements in the IECC or ASHRAE 90.1 (see sidebar on the IECC and 90.1). Many architects are moving toward conducting building simulations to comply with the energy code. This approach, known as the simulated compliance or performance path, allows trade-offs of one component of the energy system for other parts.

Although it becomes more difficult to completely eliminate foam insulation in colder climates using trade-offs, one can reduce the amount required or completely eliminate it in air-conditioning dominated climates. The trade-offs vary by climate and building type. However, many are low-cost alternatives such as higher efficiency light bulbs/fixtures or slight improvements in air conditioning efficiency. The alternatives equate to pennies per square foot versus dollars per square foot for the continuous insulation.

Last, even though uniformity is catching on, the industry should recognize that some state requirements may vary from the IECC or ASHRAE 90.1. For example, in Hawaii, where there is a significant CFS market for housing, the state's building code council amended the 2009 code by adding specific trade-offs for the foam insulation. A simulation is not required. Other states are considering their own amendments even as this issue goes to publication.

SFIA has identified energy code and thermal performance issues as priorities for the industry to address. The association is supporting the codes and standards efforts of the Steel Framing Alliance, where much of the focus is on development of new editions of the IECC and ASHRAE 90.1. SFIA is also supporting industry research to identify innovative assemblies that can meet newer code requirements in a more cost-effective manner. Look for future publications from the SFIA on these activities and other updates on significant changes to building codes and standards that effect CFS.

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