

Public Comments on FS 156-09/10 (Parts 1 and 2)¹
Present Important
Voting Decisions for the ICC Final Action Hearing:

Released: April 27, 2010

Are You Prepared to Make an Informed Vote on FS156-09/10 Public Comments?

Will the IECC Energy Code Requirements be Reconciled with IBC/IRC Building Code Requirements to Ensure Compatibility of the ICC Family of Codes?

Will added restrictions on the use of foam sheathing and more stringent application requirements for foam sheathing make the IRC and IBC better codes?

Introduction:

The International Energy Conservation Code (IECC) is pushing forward to improve the energy efficiency of buildings. These changes are intended to address a number of issues including environmental stewardship, sensible conservation of resources, long-term cost savings, balancing supply and demand for available domestic energy resources, and enhanced national security through energy independence. These advancements are associated with a federal stimulus package mandate, known as the “30 percent rule”. This rule requires states to improve energy conservation in the building stock by achieving a 30 percent improvement in the energy efficiency performance of new buildings. **Clearly, change is coming and the IBC and IRC building codes must provide construction solutions to ensure appropriate building practices to make it work.**

One of the key solutions in the IECC to achieve improved energy efficiency involves the use of foam sheathing on exterior building walls. Foam sheathing can provide many functions to wall assemblies including continuous insulation, backing for siding materials, air-barrier layer, and a water resistive barrier (see *FSC Tech Matters* – “Overview of Wall Sheathing Options: The Value of Foam Sheathing as a Wall Covering”, www.foamsheathing.org). While foam sheathing is primarily a non-structural material (e.g., it does not provide bracing to walls or support of gravity loads), it is a part of the exterior wall covering assembly. Therefore, it must be capable of resisting wind pressures, and siding must be able to attach over foam sheathing to framing or a fastener base to ensure adequate cladding performance.

Issue:

Currently, the IBC and IRC provide inadequate guidance and limitations to ensure that the IECC-required applications of foam sheathing are properly implemented from a construction practice standpoint. Thus,

¹ The Public Comment on FS 156-09/10 (Parts 1 and 2) is posted on the FSC website at www.foamsheathing.org.

without appropriately coordinated changes represented by the original FS156-09/10 proposals (with or without Public Comments jointly sponsored by the Foam Sheathing Coalition and the Steel Framing Alliance), the IBC and IRC codes will:

1. Fall short of their objective to ensure adequate building construction.
2. Miss an opportunity to provide coordinated advancements in construction technology.
3. Cause an avoidable conflict or omission within the ICC family of codes (i.e., IECC, IBC, and IRC).

Solution:

To avoid the above problems, ICC voting members should vote in support of FS156 Parts 1 and 2 and the public comments jointly sponsored by the Foam Sheathing Coalition and the Steel Framing Alliance.

The “FS156 solution” to the “30 percent rule” has three important technical benefits:

1. Energy code requirements that have broader effects on building performance will be appropriately addressed and coordinated in the building code.
2. Adequate structural properties and wind pressure resistance for foam sheathing will be provided where currently no restrictions are given.
 - a. FS156-09/10 places stringent restrictions on the use of foam sheathing that do not currently exist in the building code. It is not an expansion or relaxation of requirements for foam sheathing, as has been misrepresented in some public comments.
3. Minimum requirements for connection of cladding over foam sheathing to support cladding weight will be provided to supplement (not replace or relax) existing cladding requirements and manufacturer instructions, which generally do not address this application.

Furthermore, the proposed solution has several benefits and no negative consequences because:

1. Testing and analysis has been done to confirm all of the tabulated foam sheathing thickness and siding attachment requirements in the proposal (see [Appendix A](#) Technical Justification)
2. In all cases, the proposed requirements provide needed limitations or restrictions on the use of foam sheathing that do not currently exist in the IRC and IBC.
3. The proposed requirements provide increased quality assurance for structural properties of foam sheathing.
4. The proposed requirements prohibit application of foam sheathing in ways associated with the observed causes of damage of nearly all sheathing products in high wind events.
 - a. For example, testing and analysis show the need to prohibit the use of thinner/weaker foam sheathing materials on gable end walls. This finding agrees with field observations in high wind events for foam sheathing and other sheathing materials where enhanced requirements are needed (see *FSC Tech Matters* – “Overview of Wall Sheathing Options: The Value of Foam Sheathing as a Wall Covering”, www.foamsheathing.org).

Finally, the “FS156 Solution” has been vetted through various interests, including siding manufacturers, insulating sheathing manufacturers, steel industry, builders, building scientists and researchers, building component manufacturers, the insurance industry, and others.

Conclusion:

As stated in Section 1.2.1 of ICC Policy CP# 28-5 Code Development, the first objective of the ICC Code Development Process is to promote:

“The timely evaluation and recognition of technological developments pertaining to construction regulations.”

Based on the technical reasons and regulatory rationale given in this *Tech Matters*, the timeliness of the “FS156 Solution” and its credibility as a technologically advanced and necessary development should be clearly understood by the voting members of the ICC at the Final Action Hearings.

If you have any question or concerns regarding the implications of or technical justification for the “FS156 Solution” please do not hesitate to contact Jay Crandell, P.E., Consultant & FSC Technical Director (jcrandell@aresconsulting.biz).

Appendix A Technical Justification and Resources:

Technical justification in support of FS156-09/10 (Parts 1 and 2) and the Public Comments by FSC and SFA can be found in the reason statement with each proposal. The following additional resources provide technical details:

1. For wind pressure testing and engineering analysis supporting foam sheathing thickness requirements and prohibitions in FS156, refer to:
 - a. *FSC Tech Matters* – “Technical Justification for FS156-09/10 for integrated Design of Exterior Wall Covering Assemblies with Foam Sheathing” (www.foamsheathing.org).
 - b. Two NAHB-RC Wind Pressure Test Reports (http://www.foamsheathing.org/tech_info.php)
2. For siding fastener connection tests and engineering analysis supporting minimum fastener sizes for use with various thicknesses of foam sheathing on light-frame steel and wood construction, refer to:
 - a. www.foamsheathing.org, “Task 3 Report: Develop and Prescriptive Table....”
This report is also available from SFA at [http://data.memberclicks.com/site/sfa/NYSERDA_TASK_3_REPORT%20-%20FINAL_\(3-22-10\).pdf](http://data.memberclicks.com/site/sfa/NYSERDA_TASK_3_REPORT%20-%20FINAL_(3-22-10).pdf).
3. The above resource also includes minimum wood furring strip attachment requirements to support siding loads and resist wind pressures – an issue which is not currently addressed in the building code – with or without use of foam sheathing on a wall assembly underneath furring strips.

In addition to the above testing and analytical substantiation, other important technical decisions were made in developing the FSC and SFA Public Comments and the original FS156 proposals. These include:

1. At the request of the insurance industry, the proposed FS156 solution by FSC and SFA public comments will be limited to 110 mph or less wind zones.
2. Based on comments from the wood industry, FEMA and others at the first code development hearing, quality control provisions have been added to ensure code-intended levels of performance (as represented by FS156) are achieved.
3. Foam sheathing thickness has been limited to 4" thick, even though solutions for greater thickness are achievable and have been achieved in practice.
4. Improved safety margins or performance levels (relative to current requirements for foam sheathing and other building envelop components such as windows, doors, and some coverings) are achieved by use of a safety factor of 1.5 applied to the lowest tested results for foam sheathing products within a given type. This ensures adequate foam sheathing performance at or above code-intended levels for building envelope components (see resources listed above).
5. To avoid conflicts with siding installation requirements and siding manufacturer installation instructions, the fastener sizing requirements for use of siding over foam sheathing apply only to the fastener diameter to ensure the ability to support siding weight. All other requirements must meet or exceed fastener requirements currently in the code or the specific siding manufacturer’s installation instructions.
6. For furring attachments to resist wind pressure, fastening requirements were analyzed using the code-recognized NDS standard and the AISI S100 standard to ensure code intended margins of safety for siding connections over foam sheathing (e.g., safety factor of 3 or greater for this key failure mode)

Negative Public Comments on FS156-09/10 Part 2 (IRC):

Negative public comments made by AF&PA, APA, and FEMA are all adequately addressed in the above technical justification. It is important to note that the concerns voiced in these negative public comments are in general agreement with the proposed “FS156 solution”, which increases performance requirements for wall covering assemblies with foam sheathing. It is for this reason and others that the IRC CDC approved the FS156 Part 2 proposal at the first code development hearing. The general complaint in these

negative public comments is that “FS 156 Solution” is not enough – not that it isn’t making a major improvement in the code. Therefore, the action requested in these negative PCs to disapprove the “FS156 solution” leaves the code with no foam connection regulation advancement, when it is clear that one is needed. Not taking action in support of the “FS 156 solution” will result in the status-quo, which means the problems and concerns raised in these PCs and in this *Tech Matters* will go unanswered. This would result in continued problems and an inexcusable conflict within the ICC family of codes as mentioned earlier (i.e., IECC requirements not coordinated with solutions in the IBC and IRC).