

# EXPLANATION OF FOOTNOTE H

# R2ci ≠ R5ci – “Footnote h”

- The application of an earlier version of a footnote to the R-value table was stretched beyond its original intent.
- The intent was to provide for a uniform wall thickness when partial structural sheathing is used (not fully structurally sheathed buildings):
- [Table R402.1.1, footnote h](#):
  - h. First value is cavity insulation, second is continuous insulation or insulated siding, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation or insulated siding. If structural sheathing covers 40 percent or less of the exterior, continuous insulation *R*-value shall be permitted to be reduced by no more than R-3 in the locations where structural sheathing is used – to maintain a consistent total sheathing thickness.

# R2ci $\neq$ R5ci (cont'd)

- In the 2015 IECC-R, this has been corrected by new text limiting its application to walls only with partial structural sheathing as originally intended

**R402.2.7 Walls with partial structural sheathing.** Where Section R402.1.2 would require continuous insulation on exterior walls and structural sheathing covers 40 percent or less of the gross area of all exterior walls, the continuous insulation *R*-value shall be permitted to be reduced by an amount necessary to result in a consistent total sheathing thickness, but not more than R-3, on areas of the walls covered by structural sheathing. This reduction shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

# R2ci ≠ R5ci (cont'd)

- To claim an R-value as a reflective air-space, it must meet the requirement of “no air-leakage” in the area behind the siding
- This is basically impossible for most residential siding materials
- Recent ASHRAE 90.1 changes clarify the issue:
  - Air-spaces must be enclosed within a building assembly
  - Air-spaces must be located to the interior of an air-barrier
  - Thus, because siding ≠ air-barrier, reflective air-spaces cannot be included in the wall or CI R-value
- For more details, see [2012 IECC and IRC Energy Chapter Code Development Footnote “h”- The Energy Code Loophole](#)

# R2ci ≠ R5ci (cont'd)

- The 2015 IECC requires a R0.6 reduction for insulated claddings or exterior wall covering
  - IECC Table R402.1.1 (prescriptive) assumes R0.6 for generic siding, including the air-space behind the siding
  - A R0.6 reduction brings a wall assembly complying with Table R402.1.2 (performance) in line with the prescriptive table assumptions
- Thus, the R2 must be reduced to R1.4 to avoid the R-value of the air being double-counted to get to the R2 loophole in the older footnote h.

**R402.1.3 R-value computation.** Insulation material used in layers, such as framing cavity insulation, or continuous insulation shall be summed to compute the corresponding component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table R402.1.2, the manufacturer's labeled R-value for insulated siding shall be reduced by R-0.6.

# R2ci ≠ R5ci (cont'd)

- The improper use of footnote h can erode continuous insulation R-value from R-5 to R-2 or less for the whole structure.
- It is the code official's job to disapprove this
- Refer local code officials to this presentation available on the [FSC website](#) for more information.

