

# Another Shade of Green



By *Keith Lindemulder*

Last week we started to look at the thermal properties of Cold-Formed Steel framing. We also noted that the building codes do their best to “make it simple” and provide prescriptive guidelines to builders and inspectors to follow wherever possible. However the complexity of the homes we build today can significantly complicate the ability to accurately predict the homes performance.

In theory, the easiest way to calculate the thermal resistance of a wall would be to add up the “R-value” of each individual item in the wall assembly. Unfortunately, since conventional walls contain framing materials in addition to the insulation – we need to account for the framing as well.

One method to calculate the overall R-value of a wall is called the Parallel Path Method. Simply explained, you take thermal resistance of the wall area without wall framing and average it with the thermal resistance of the area with framing. Since wood studs are solid in shape, this works well because that 1-1/2” wide stud will have consistent thermal properties across the whole edge of the stud. However with Cold-Formed Steel walls, things are different.

Steel studs are not solid shapes but formed into a “C” shape with the web thickness much thinner than the 1-1/2” thickness of wood studs. However we can’t just use the thickness of the steel as the area of the wall framing because the flanges of the stud (the edge sheathing and drywall are attached too) make efficient heat “collectors”. Any heat collected by the flanges is conducted along the web of the stud very efficiently. Even though steel studs are much thinner than wood, steel can conduct heat 400 times better than wood.

So CFS walls use a Modified Zone Method calculation which accounts for the ability steel has to conduct heat. The Modified Zone Method is similar to the Parallel Path Method but it mathematically ‘increases’ the area of the wall framing. In other words, instead of using 1-1/2” for the stud, this method effectively increases that thickness to something larger to account for the steel stud and averages is with the wall area without framing.

There are other modifications to the formulas, such as California and the formulas are actually a bit more complicated than I explained, but the goal of each is similar. They try to ‘equate’ various building materials and various ways to assemble walls into a simple number which can be used for comparison. That way only stud material, stud spacing and stud depth (wall thickness) are variables which need to be considered when building a wall.

This week I’ll be attending what’s become the premier trade show for sustainable construction. The USGBC (United States Green Building Council) is holding their annual “GreenBuild Expo” in Boston this week. More than 30,000 people are expected to attend the exhibit hall and educational sessions.

Have a SAFE and Sustainable week!

**Reduce!**

**Reuse!**

**Recycle!**



**STEEL**  
IS THE NEW GREEN.



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