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Interpretation Date:	April 20, 2021
Building Code Edition:	BC Building Code 2018
Subject:	Calculating Effective Thermal Resistance
Keywords:	Effective, thermal resistance
Building Code Reference(s):	9.36.2.4.(1), A-9.36.2.4.(1)

Question:

The formula for calculating the Effective Thermal Resistance of a Wood-frame Assembly in A-9.36.2.4.(1) yields results that are different than might be expected. If a wall has 50% framing area with $RSI_F = 1$ and 50% cavity area with $RSI_C = 5$, the logical expected RSI_{eff} would be the average of 1 and 5 which would be $RSI_{eff} = 3$. Using the formula in A-9.36.2.4.(1) the result is $RSI_{eff} = 1.667$.

Is there something wrong with the formula?

Interpretation:

No

The relationship between RSI_F and RSI_C is not linear when calculating the effective thermal resistance.

If 50% of the wall is solid wood framing, the thermal bridging has a much more significant impact on the effective thermal resistance which results in a much lower effective RSI.

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