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Joinery for Timber Framing & SIPs

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Timber frames make spectacular buildings, but the building envelope and other building components and systems have to be adjusted for the idiosyncrasies of timber framing. By using compliant joinery at strategic points in the envelope, unintended movement and cosmetic flaws can be eliminated while durability and energy performance can be maintained.

Green timbers will shrink, and big green timbers will shrink a lot. Since they will shrink, whether we want them to or not, it's better to design the envelope (SIPs, stick-framed, or otherwise) to accommodate this movement rather than fight it or ignore it. The first recognition is not of absolute movement, but of relative movement. If the whole roof system drops down as a unit as the rafters shrink, everything is fine, except where the roof meets the rigid wall. Walls need room at the corners to allow the corner posts to shrink.

Second, the structural design must not be violated. There have been cases where, because timber shrinkage wasn't addressed, the rafters were lifted out of their housings by the roof panel bearing on the top edge of the wall panel. A change in load path like this can cause the panel or timber to be overloaded. Also, the structure requires that lateral loads be transferred from roof diaphragm to wall diaphragm to foundation. These loads can be passed around the compliant joinery via the timber, if the timber frame is designed with this in mind.

Finally, the most likely result of unintentional movement is cosmetic problems, cracked drywall, sticking doors, and air leakage that wastes energy and can cause moisture damage requiring very expensive repairs.

The thesis of this presentation is that it's better to look at the building structure holistically and intentionally handle these interactions.

About the Speakers

Paul Malko
Paul Malko has been with Foard panel for over 13 years and served as Technical Director for the last 10. In that time, Paul has contributed to the structural design, code compliance, and long-term durability of hundreds of buildings, timber frame and otherwise. Foard has gained a strong understanding of building science and long-term durability because Mr. Malko and Bo Foard have consulted on dozens of existing buildings undergoing repair and renovation.

He is a long time member of the Timber Framers Guild and Timber Frame Engineering Council. Within the Structural Insulated Panel Association, Mr. Malko serves on the Manufacturer's, Technical, and Code Listing Committees, and is a past chairman of the Code Listing Committee.