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"Truss Bracing: Do We Really Understand" by Brian R. Keane, P.E.

The concept of laterally bracing a structural component such as a pre-engineered wood truss would appear to be a logical requirement if stability of a roof assembly is to be attained. With that said, why are the bracing requirements for wood trusses so misunderstood? Despite the efforts of TPI, WTCA, the building codes and the abundance of warnings put out by truss manufacturers, the necessity of appropriate bracing is minimized and sometimes even ignored on projects that use pre-engineered wood trusses.

A recent roof collapse on a single story commercial office building in Florida unfortunately revealed the total misunderstanding by those involved in the design and construction of the pre-engineered wood trusses.

As is typical with most building collapses, a multiplicity of errors and/or oversights are usually required for a collapse to actually occur. In the referenced case, omissions at the design stage initiated the subsequent chain of events: (1) the truss design span of 70' using piggy-back trusses would normally dictate specific attention to the truss bracing requirements; (2) however, the truss specifications for the project were limited to a one-line reference to the Truss Plate Institute. This minimal specification would tend to imply that the bracing of wood trusses is totally understood, and further clarification is therefore redundant; (3) the permitted documents made no other references to temporary erection bracing, lateral chord bracing, or building bracing, all of which are required for a pre-engineered wood truss assembly; (4) neither the designer of record, the contractor, or the erector, appeared to understand the bracing requirements for this project. However, the Standard Building Code (1997) specifically references HIB-91 as the minimum requirement for bracing wood trusses. HIB-91 deals with trusses up to 60' with an engineer required to design the bracing system if trusses exceed 60' in length.

Despite numerous advisories by the truss company regarding the bracing requirements for this project, all notices went unheeded. The trusses were erected with only light gauge metal spacers and a very minimum of wood bracing material. In fact, the metal spacers were removed on a Friday night in the anticipation of installing permanent wood bracing on the following Monday. Unfortunately, the trusses collapsed on Sunday. It should also be noted that the referenced metal spacers should not have been considered bracing as published by the bracing manufacturer.

In summary, the project did not have a structural engineer involved in the design, the building designer provided no bracing requirements, the contractor and erector ignored even the minimal code requirements of HIB-91, and all involved, including the building department, overlooked a code requirement for an engineered bracing design for trusses over 60'. Upon reviewing this scenario with a distinguished member of our industry, the comment was made, "How do we

legislate against stupidity?" The answer is simple, we can't. However, every time a truss collapse occurs, it gives our industry a black eye. So who is responsible? The insurance company is still trying to figure that out. But we, the wood truss industry, can take a more proactive approach to educate the rest of the construction industry on the absolute requirement for adequate truss bracing as well as why it is beneficial for all of us to insure wood trussed buildings are properly braced.

To start, ask your next customer (architect, contractor or erector) to name the three types of truss bracing required when using pre-engineered wood trusses. If he or she does not know, you have found your first student. Proceed to explain the different types of bracing and who is responsible for each type. (To obtain more information on how to do this through Truss Technology Workshops email ttw@woodtruss.com.)

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[SBC HOME PAGE](#)

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