WEB BRACES – THE WEAK LINK

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Everybody would be familiar with the expression "a chain is only as strong as its weakest link". This is also true for trusses. If one element of a truss fails, the truss will fail.

Fortunately in a trussed roof, trusses are closely spaced and load from a failed truss will be shed to stiffer and stronger adjacent trusses. Provided that the adjacent trusses have sufficient strength to support the additional load the roof will not collapse.

A common "weak link" in a trussed roof is the web brace. We can select the best timber, accurately cut the members and painstakingly place the connector plates into the correct position and still end up with a structurally inadequate truss, if any web braces, which may be specified in the truss design, are not properly installed on-site.

Unfortunately web braces are very easy to overlook when installing trusses. Web brace locations should always be shown on truss layout drawings supplied to the installers.

However this is usually not enough to ensure that they are properly installed. A 'belt and braces' approach is required wherever web ties are specified; otherwise you could be exposing your company to potential expensive litigation.

To ensure that critical webs are in fact braced, our company supplies a 'Brace Here' sticker, which should be applied to every web that requires lateral bracing. These stickers are inexpensive and I would say are good insurance against potential claims should a roof collapse due to the failure to install web ties.

As web ties are usually required in a run of trusses the failure to install them is critical to the integrity of the roof structure. As I mentioned earlier, if one truss in a series of trusses fails, usually there will be sufficient reserve strength in adjacent trusses to prevent a collapse.

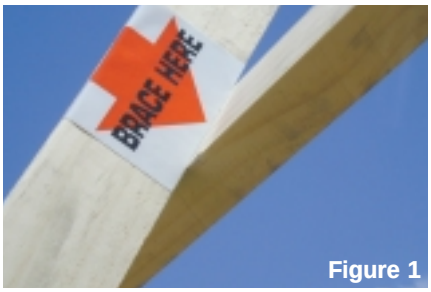

Figure 1

However if we have a series of trusses with the same fault, as we would have if a web brace was not properly installed, the chance of collapse is increased significantly.

Web ties, to be effective, need to be properly installed. It is not sufficient to simply nail 70 x 35 brace to the web. To be effective the web ties also need to be fixed back to a rigid part of the building.

The best and most effective way to do this is to form a cross-brace in the plane of the web; thereby bracing the web tie back to the ceiling and roof planes. **(See figure 1.)**

Where web ties are required on one or two trusses only, which will happen when internal supports are used to support large span hip ends, or where small returns create a small number of cantilevered trusses. In these cases it is best to use a web stiffener in lieu of web ties because the odd isolated brace is more likely to be missed.

Web stiffeners should be used in preference to web ties where the webs to be braced are not in alignment.

Also it is often very difficult to fix web ties to a rigid part of the building where there is only one or two trusses involved. Web stiffeners can be readily substituted for web ties using reference sheet DTRS-0003, which will give the size of the stiffener and the fixing details.

However, the simplest and most effective way to replace a web tie is to use a factory installed steel stiffener like the Eliminator. The Eliminator has integral teeth and is simply pressed into the web during assembly process. The Eliminator, once it is pressed into the web, does not protrude beyond the thickness of the timber so it does not inhibit stacking, as does timber 'T' stiffeners.

The use of products like the Eliminator avoids the potential litigation should the truss installer forget to fix web ties. Even though you may have documented the need for web ties, there will always be doubt as to whether this information was properly and adequately be conveyed to your clients and the installers.

Factory installed stiffeners will avoid reliance on third parties (over which you have no control) doing the job properly. Therefore in my mind factory installed stiffeners should be used in preference to web ties.