ARE YOUR DESIGNS BEING FOLLOWED ON SITE?

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A telephone call frequently received by our engineers goes something like this:

Engineer: Hello, how can I help you.

Builder: Your trusses have failed! We need you to come out on site quickly. They are deflecting more than they should.

It's situations like this that engineers often have to deal with. Nearly all cases of the so-called truss failures end up being due to a handling or installation problem. In these cases, the manufacturer's specifications were not adhered to.

The advances in today's computer technology have vastly improved the analysis and design of timber roof trusses. Computer software programs have simplified the process of designing roof trusses. Technology has even greatly improved the manufacturing process of the timber roof trusses.

Whilst there are specialist software programs to aid in the design and manufacture of timber roof trusses, the handling, and installation of the trusses are a crucial stage to the project.

To ensure that the timber roof trusses perform as designed, it is essential that the trusses be handled, erected and braced correctly. The importance of getting it right on site is a crucial aspect to the performance of the roof trusses.

So crucial is the installation process of prefabricated timber roof trusses, that it is now covered by the Australian Standard AS4440 - 1997 - "Installation of nail plated timber trusses". Refer to our Gang-Nail Guidelines No. 1, by Tim Rossiter for a background information on AS 4440.

Additional information, such as user guides and/or reference sheets is also provided for use with the computer software programs. The user guides and reference sheets provide the user with the background information required to design timber roof trusses.

It is essential that the detailer understands what assumptions have been made by their software programs and to ensure that these assumptions are passed on to their clients.

In the design stage of timber roof trusses, it is assumed that the truss manufacturer will comply with the exact fabrication requirements of the truss software program output. Namely:

- timber size, species and grade;
- metal plate connector size, location and orientation;
- camber; and
- tie-downs

Once the trusses have been fabricated and the truss layout has been detailed, the flow of information must be passed on to the client/builder who then must comply with all the requirements of the truss manufacturer's specifications and AS4440 - 1997. The manufacturer of the roof trusses then passes on the duty of care and thus assumes that the trusses are:

- handled correctly;
- installed in accordance with the truss layout and AS4440 - 1997;
- installed the right way up;
- where required, are correctly positioned over internal load bearing walls, as intended by design;
- roof bracing complies with truss layout and AS4440 - 1997;
- truss to truss and tie down connections are correctly installed;
- truss spacing, top and bottom chord restraints (battens) are positioned correctly, as intended by design; and
- web and 'T' stiffeners are correctly placed, as required

For further information, refer to a previous Gang-Nail Guideliness No. 7 'Things That Go Bump In The Night', by Robert Tan, which covers some of the topics mentioned above that are commonly omitted or not completed.