Autobuild News
GANG-NAIL® Guide Lines NO. 1
BUILDING ON INNOVATION

# HELPING TO GET IT RIGHT ON SITE

*- AS4440-1997 Installation of nailplated timber trusses by Tim Rossiter, chief engineer, Gang-Nail Australia - Sydney*

**A lot of effort, time and money is invested into the design and efficient manufacture of timber roof trusses.**

Much work has also been done recently on timber load capacities, one result being the new grade of Machine Graded Pine (MGP).

**Likewise the software developers and engineers in the employ of the nailplate manufacturers are continually improving the products used for the design and detailing of roof trusses.**

But what happens on site?

Up until now the responsibility has been on the builder to follow one of a number of Truss Installation Guides produced by the nailplate manufacturers.

Then the inspecting authority is relied on to double-check that installation.

Now, replacing a number of similar, but sometimes conflicting documents, there is a new Australian Standard available - AS 4440 1997 - Installation of nailplated timber trusses.

There are many assumptions made at design time about the way in which trusses will be handled and installed.

Incorrect installation can at best simply overstress the timbers, or at worst, be the main cause of perfectly good trusses collapsing.

In fact in a report in the United States, it was found that incorrect temporary bracing – just one of the many stages of truss installation - caused over 60 per cent of truss collapses.

Local experience by engineers required to inspect 'problem roof trusses' find a very large proportion of the issues are related to poorly erected, braced, or connected trusses.

The other major cause of apparent roof problems is that the supporting structure or system is inadequate in its accuracy, capacity, or location.

Unfortunately, trusses present problems usually after they are loaded for a period of time – often even after the ceiling is installed.

This makes for costly and difficult solutions, often these problems could have been avoided simply by getting it right in the first place.

AS4440 is the result of three years of unprecedented co-operation between engineering staff from each of the nailplate manufacturers, all of whom participated in the writing and editing.

Ashley Henkel of Dahlsens Building Centres, one of the largest groups of truss fabricators in Australia, chaired the task group, under the supervision of the TM/2 committee, responsible for timber framing issues.

The task group also included representation from building inspectors and industry groups.

They started from current installation guides and evolved them into a national document that gives a uniform basis from which to correctly install, and check the installation of, roof trusses.

It is hoped that the Building Code of Australia will call up this document in the New Year, as quite a bit of effort was put into the wording in the Code to ensure that it would conform with the legal requirements which would allow its inclusion.

While attempting to cover as much of this varying continent of ours as possible in terms of wind loading, roof pitches and styles - there had to be some limits.

The code covers sheet metal and tile roofs in wind velocities up to 60 metres per second for trusses at up to 900 mm centres.

For sheet metal roofs with trusses at 1200 mm centres the limit is 41 metres per second.

The sections of the standard are:

1. Scope and General
2. Supporting Structures
3. Truss Installation
4. Roof Bracing
5. Truss Connection
6. Overhangs

There are also appendices giving recommendations on approval documentation, temporary bracing and handling among others.

As part of the General Section there is a listing of current truss terms as they are currently used.

There was much discussion on these, both in the group and through public comment, as the building industry uses terminology that varies surprisingly from region to region.

It was also difficult for the task group to know where to stop as there were requests for details that may have been the responsibility of other components of the building system.

Some recommendations are given in an attempt to cross a few of the boundaries, for example in the fixing of cornices, which is discussed in Appendix B.

There is currently discussion within the truss industry about the need for a Handbook to accompany the standard and for a wall chart that can be displayed on site, illustrating some of the more important elements of the code.

Timber trusses are an engineered component of a structure, and as such require as much care as any other engineered component.

The footings and foundations are checked for correct interpretation of the engineer's design. So it should be with trusses.

Correctly installed they will perform to their full capacity, giving a safe and straight structure.

Competent application of the details of this standard will go a long way towards ensuring that the truss installer does get it right first time.