

THINGS THAT GO BUMP IN THE NIGHT



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In the past two months, there were reported to me a number of roof trussed projects that collapsed overnight in the course of construction.

The singularly common cause of collapse in those cases was a failure to adequately brace the roof trusses during installation.

Fortunately, no one was injured by the trusses falling down as they all occurred whilst the sites were unattended during the night.

However, there were a number of red faces along with the expense and delay of replacing the trusses.

The health and safety inspectors thereafter also forced a much stricter control on site, adding to the builders' frustration.

All the failures described were quite preventable if the builders had followed normal recommendations as outlined in the Gang-Nail installation instructions or in AS4440-1997 "Installation of nailplated timber trusses".

Tim Rossiter recently covered this Australian standard in the first article of this "Gang-Nail Guide Lines" series.

In one of the cases above, the developer's own engineer tried to dispute the obvious that a single binder on the top chord of the major girder truss was inadequate and suggested instead that the trusses were of inadequate strength.

If building developers fail to heed such obvious warnings, they are bound by history to repeat the mistake again in future.

It is evident in my experience that many builders, especially site foremen and supervisors, do not have a good working knowledge or grasp of the content of the installation guidebooks mentioned above.

I base this on many commercial jobs that I have had to inspect and certify.

The items that are most

commonly omitted or incomplete are listed below.

INADEQUATE ROOF BRACING

Some builders waste part of the speedbrace supplied as temporary binders and install only the remaining speedbrace in roof bracing, resulting in inadequate bracing layouts. Others fail to follow the bracing diagram supplied and install to their own fancy.

INCORRECT END FIXING OF BRACING

The ends of speedbrace are often not properly anchored by wrapping the ends over the top chord or top plate.

If the speedbrace is not wrapped around the top plate at the supports, the corresponding timber blocking detail to prevent roll over of the truss heel is often missing.

INSUFFICIENT TOP CHORD BINDERS

Roof bracing is basically ineffective without binders to restrain the top chords from buckling.

From my observations, the number of temporary binders installed is often less than the minimum recommended by the guidelines, which is at every web panel point.

This is a very dangerous and risky practice.

INSUFFICIENT BOTTOM CHORD BINDERS

These are conveniently omitted because they seem to have little purpose. However, they are essential to keeping trusses true and plumb in the course of construction.

Where the ceiling is suspended or fixed with clipped-on furring channels, they become essential (in conjunction with bottom chord bracing) to truss stability under uplift.

OMISSION OF CANTILEVER AND CUT-OFF BRACING

On virtually every site I have inspected, the bracing of cut-offs and cantilevers have been omitted.

There appears to be a total lack of understanding of the purpose of this bracing, which is to transfer forces from the roof bracing to the wall bracing.

Every chain is as strong as the weakest link, and should this link be missing altogether, the consequences could be disastrous.

TRUSSES INSTALLED OUT OF PLUMB

The results of this bad practice are often not obvious until much later when the trusses sag under load.

Trusses behave poorly if they are not plumb and rectification after the event is often very difficult.

Few builders to my knowledge actually rely on spirit levels during truss erection which is disappointing because near enough is not always good enough.

INTERNALLY SUPPORTED TRUSSES INSTALLED THE WRONG WAY ROUND

Internal support points are always marked on the trusses but some builders simply unpack and place trusses they way they were delivered without any consideration to orientation.

PARALLEL CHORD TRUSSES INSTALLED UPSIDE DOWN

The shape of parallel chord trusses requires the installer to check whether it is the right way up.

Once I had the occasion to look up at an erected truss only to read the words "TOP" marked at the bottom of the installed truss.

WEB BINDERS AND BRACES

Long webs often require bracing to prevent buckling

under load and such webs are usually marked.

Most builders notice the web marking and nail the binders on but many fail to realise that diagonal braces are also required at the ends of each binder and at intermediate locations if the binder is greater than 10 metres long.

INSUFFICIENT NAILS TO HOLD DOWN BRACKETS

The Gang-Nail product brochures and the installation instructions all show the required number of nails into each product.

If uncertain, every available hole in the bracket should be nailed.

It defeats the purpose of a connector if it is not adequately nailed off.

FAILURE TO CONNECT TO INTERNAL NON-LOAD BEARING BRACING WALLS

Transfer blocks are required to connect the ceiling diaphragm to the wall bracing.

Bracing walls would be totally ineffective should these timber blocks be omitted.

At this point in time, few builders know about the existence of AS4440 much less have a copy of one.

Nor do many actually read the Gang-Nail installation instruction booklet that is supplied with every truss job.

It sadly remains to be learnt the hard way when things go bump in the night.