



By Tim Rossiter, state manager, NSW and WA

Air conditioning units and trusses

We are regularly asked about air conditioning units and their “interaction” with roof trusses. Unfortunately this usually means that an AC unit or duct needs to occupy the same space as an existing truss member (usually a web or two). We all know how that one goes and there have been plenty of articles written that are aimed at avoiding bad choices.

For the record – NEVER cut a truss element without prior approval from the truss manufacturer!

This article is not about repairing unsanctioned modifications by the uneducated. Instead, it is about how to get the best results when an AC unit is to be supported by trusses in the roof space.

The Association of Wall and Ceiling Industries of Australia and New Zealand (AWCI) recently consulted us for an article on this very subject. Their members are also regularly called out to deal with issues that are a direct consequence of inappropriate AC installation.

The guideline I am providing here mainly concerns residential buildings,

as commercial ACs are in a whole different league when it comes to multiple or heavier units, plant rooms, service platforms, walkways and inflexible heavy ducting.

First and foremost, trusses which have to support an AC fan coil unit (usually about 120kg max), must be designed and manufactured to be sturdier than normal. But if the unit is to be retrofitted, the existing roof trusses have to be re-designed for modification details to strengthen them appropriately.

Secondly, AC units must be installed only on the trusses which were designed for the purpose, and in the specified manner of suspension or support. In the case of new trusses, the locations are usually clearly marked on individual trusses (see photo) and referenced in the roof truss layout. Make sure that the truss installer and AC installer both get copies of the layout. I recall at least one instance of a split upper/lower level roof, where the trusses in the steeper upper roof were designed to support the AC, but the AC crew thought the lower flatter roof was a “better” idea!

Did I mention – NEVER cut a truss element without prior approval from the truss manufacturer?

Thirdly, my recommendations for where AC units are best located are:

- Where there is the most clearance height and fewest webs, ie, generally the middle of the span.
- Within standard trusses, so that extra strengthening is minimised; and off 4 load points, which is usually where the support locations on the units are.
- Hung from the top chords. This minimises vibration on ceilings (just ask AWCI members). On bottom chords, AC vibrations will be directly transmitted to the attached ceiling material. Whether their fixing can tolerate persistent vibration over time is simply best avoided, than having to face the consequence of an easily avoidable problem.
- Not suspended off web members. They are usually designed only for pulling and pushing forces between chords, not for any bending in between.

I recognise it is not always possible to follow these recommendations due to architectural or geometric constraints, or comfort-level expectations (read – how big a unit does one really need?). In these instances, it is even more important to coordinate early with the truss designer and manufacturer to get the best possible result. Leaving discussions until after the trusses have been designed, installed and ceiling lined inevitably leads to an unsatisfactory outcome and costly repercussions.

BTW did I happen to mention – NEVER cut a truss element without prior approval from the truss manufacturer? **T**

How to get the best results when an air conditioning unit is to be supported by trusses in the roof space.



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