GANG-NAIL GUIDELINES No.149

ANOTHER MITEK ADVANTAGE

'SERVICES' IN TRUSSED ROOFS?

Whenever services have to be fitted in roof spaces, fabricators are faced with a choice of truss layouts and web options to accommodate them.

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Although the size, weight and location of each unit are important influences on the decision, a clear understanding of the pros and cons of each option is a good foundation to making the right judgement.

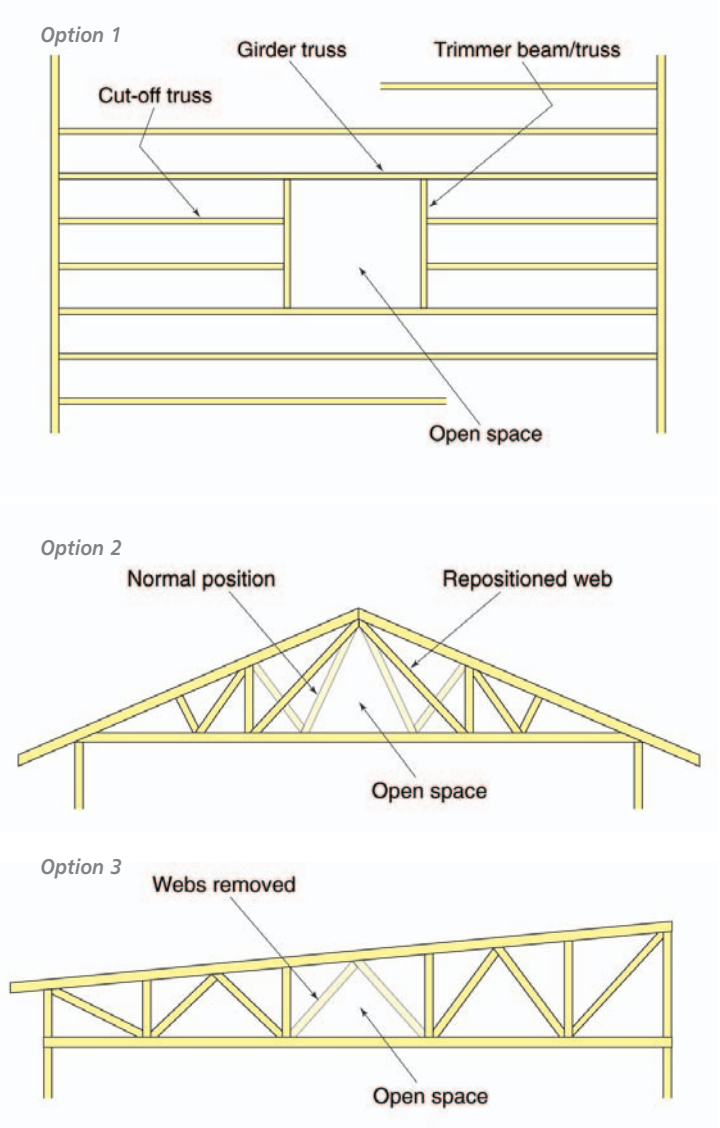
Option 1 - Box an area

The most encompassing method of creating a space is to "box" an area out with girders and trimmer beams/trusses.

This suits large and heavy units which have to be lifted into position and allows a platform to be built for easy access and space to service the appliance.

A pop-up roof may also be incorporated for increased height if necessary.

Although possibly the most expensive option, it rewards by being the strongest and most reliable method, with the least risk of "misbehaviour" from undesirable deflection issues.



Option 2 - Reposition panel points

Another acceptable method is to re-position panel points so that a wider space is created between webs to fit the unit or ducting.

By maintaining "triangulation" in web layout, the truss is able to retain its cambered shape during production.

Supplementary collar ties may be installed between webs to suspend the units without overly stressing the webs in bending.

This economic option suits a line of ducting or moderately sized units and is just as reliable as option 1.

It may however, require a higher timber grade in the chord where the panel length is extended.

Option 3 - Remove webs

This is the least desirable option because it is fraught with risks.

Eliminating webs to accommodate a unit may be convenient but any loss of "triangulation" inherits several problems with it, even if the software "successfully" designs the truss.

For example, any pre-camber in a non-triangulated truss will spring out as soon as it is released from the jigging platform.

When the truss is later installed and loaded, a sag in the ceiling will appear.

This option is commonly chosen out of indifference or false economy but occasionally because option 2 cannot physically fit the size of the unit.

In this instance, since weight usually accompanies size, Option 1 should be the next logical solution.

Although it pretends to require the least effort from the detailer, Option 3 is not necessarily the cheapest truss solution because it induces high bending stresses and additional precautions are needed.

But if unavoidable, the following advice may help reduce the risk with this option:

- Create the space about mid-span between supports. Avoid spaces close to supports where shear forces peak and where webs are most needed;
- Increase chord sizes to reduce truss deflections, preferably to under 6mm;
- Install hanging beams and/or underpurlins across these trusses and extend them into adjacent fully triangulated trusses to level out differential deflections.
- Seek professional advice from your engineer.

By always providing the best solution for your customers, you will gain their confidence and future business. TTN