

SPLITTING TRUSSES ABOVE INTERNAL SUPPORTS

Although the use of internal supports is a well known practice to address potential truss deflection problems, it also comes with its own perils.

The modern trend for flat pitched roofs with boxed gutters presents interesting challenges for deflection control as shallow roof trusses deflect much more than deep roof trusses, while large truss cambers have issues of their own, including difficulties in manufacture and even less reliable finishing.

In GN Guidelines 83 and 89 some of the pitfalls of using internal supports were addressed; particularly where support walls were too close together, and when roof trusses did not sit on the centre support.

This article deals with another potential problem - where the internal wall(s) is set at a higher level than the external load bearing walls.

Over the past few years we have witnessed some extreme weather conditions throughout the country, from flooding in the northern regions of Australia to drought in the south.

These conditions, in turn, have a direct effect on the soil. When reactive clay soils get very wet, they can heave and lift the centre of a foundation slab up.

Conversely, when they dry out too much, the soil around the edges of a foundation slab may sink causing the outer perimeter of the slab to drop (See Figure 1).

Either extreme condition can result in internal walls being relatively higher than the external supports.

When an internal support wall rises to a higher level than the external walls, the effect is like that of a seesaw but without the fun or enjoyment for anyone involved.

It leads to uneven roof and ceiling planes, and may also cause the truss above to overstress.

This is because the truss will try to act like a cantilever, but, as it was not designed for this purpose, it will fail and distort until it again rests on every wall.

By this time, the stresses placed on

By **DEAN ASHTON**

*State Engineering Manager, Victoria
MiTek Australia Limited*

the truss would have redistributed around the truss and some timber members and nailplates will be placed under a greater, and potentially, unacceptable load.

The Australian Standard - AS 2870 - Residential slabs and footings - regards differential raft footing movements of up to 40mm for clad frames and 30mm for articulated masonry veneers as normal.

Such extreme movement has a clear impact on roof and ceiling lines. From experience, I have visited many sites to investigate purported "truss problems" that in the end turn out to be "slab problems".

One way to avoid the potential overstressing of a roof truss when internal load bearing walls are used is

to divide it into individual simply supported trusses.

The two separate trusses will function independently of each other and will therefore be relatively unaffected by any distortion caused through slab movement (See Figure 2).

When internal supports are incorporated in design, it is recommended that there be clear communication and consistent documentation between all parties, including the builder, the truss and wall frame designer and the foundation designer.

For the truss designer, it may be worth considering whether the trusses above the internal support wall should be split into two parts to reduce the risk of damage from slab movement.

For further information, contact your nailplate supplier.

Figure 1

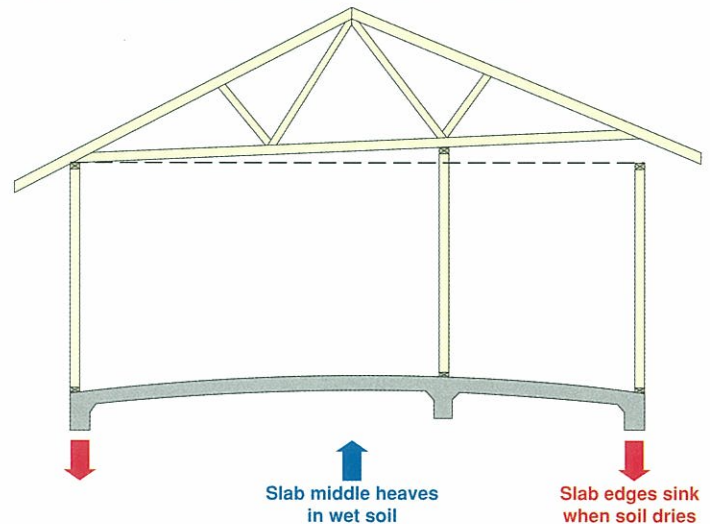


Figure 2

