MiTek®

GN GUIDELINES No. 199

ANOTHER MITEK ADVANTAGE – FEBRUARY 2014

PATRICK GRANDON
State Engineer, Victoria

INTERNAL LOADBEARING GHOSTS

Whenever a crack appears in the ceiling or cornices, most people are quick to point their fingers at roof trusses as being the cause.

More often than not, however, the source of the problem is actually elsewhere.

In some cases, internal loadbearing walls meant to be there to support trusses turn out to be ghosts.

I was recently called to investigate one such incidence in an existing house where the cornices were crushed.

It wasn't long after reviewing the drawings, truss designs and layout that I soon hit the jackpot. The structural drawings indicated an internal loadbearing wall that, for some unknown reason, was built as a non-loadbearing wall instead.

■ *Photo 1: Cornices crushed under each truss.*

As a result, outer wall lintels were overloaded and trusses deflected where they were expecting an internal support. This was what led to the cornices being crushed at regular intervals under each truss as shown in Photo 1.

In another incidence I was called out to, the scenario was a slightly different but related one.

The trusses over an al fresco area were meant to be supported by a wall to the outdoor space (Photo 2).

However, the builder omitted to install a corner post to support the header above the sliding door. As a result, the sliding door jammed, the al fresco veranda beam was overloaded, the ceiling cracked and the roof above the area dipped.

Several temporary props had to be installed in the middle of the kitchen and living area for a period of time which created a nuisance for the occupants and added to an already large repair bill.

Structural drawings depict the engineering philosophy of a building. It works only when every part is constructed as shown.

It contains design requirements and assumptions critical to performance, such as the locations of girder trusses and loadbearing walls. That is why construction drawings must be followed verbatim. Otherwise it could end up a disaster.

Building elements which are shown, such as an internal loadbearing wall, must not be left out as it could affect other parts of the structure as in the examples given above.

■ *Photo 2: A corner post to support the header was missing.*

The same applies to the other way around as well.

Elements which are non-structural must not be loaded either.

For example, a non-loadbearing internal wall must not be used as bearing points for trusses. That could cause any number of issues such as roof deflection, ceiling damage, overstressed truss and wall elements, jammed openings and maybe even foundation movement.

Since trusses are capable of spanning great distances, it is usually much better for building designers to avoid specifying internal loadbearing walls for support unless it is unavoidable.

There are fewer things that can go wrong when trusses are clear spanning. In addition to the problem examples described earlier, it is also difficult to ensure that all multiple supports are perfectly level on site, as trusses are reliant on this.

There is also potential for extreme movement when concrete slabs are laid on highly reactive soil which wreaks havoc on the house above.

Simply supported trusses are more tolerant of slightly uneven wall levels. They are also not much different in price to trusses where internal supports are used.

If the structural engineer deems an internal loadbearing wall to be necessary, one suggestion is to split the trusses into two halves above the internal supports. This was discussed at length in GN Guidelines No. 143.

The bottom line is this: Always follow the engineer's drawings to the letter, particularly where internal loadbearing walls, truss orientations and girder locations are shown.

Consult the builder or building designer before making any variations to the construction drawings. To not do so is likely to bring you trouble. TTN