

BETTER TRUSS PERFORMANCE AT LOWER COST (when to use internal load bearing walls)

One of the major advantages that Gang-Nail trusses have over traditional conventionally framed roofs is their ability to span across external walls, thus affording complete freedom for internal wall layouts.

As our society becomes more affluent and our buildings larger, it is no longer satisfactory to be so simplistic.

Under certain circumstances, it would be prudent to consider the use of internal load bearing walls to improve the overall

environment, most builders would not be prepared to pay the increased cost of larger timber sizes that would result in reduced cambers.

It is therefore imperative for a good designer to understand when and where to provide internal load bearing walls in the working drawings to improve both performance and cost.

The reason overall costs are reduced, in spite of having to strengthen the internal wall frame and foundation, is the result of savings in truss timber sizes,

corridor marks a convenient line of internal walls for support.

- Underneath trusses that are not supported at natural heel points but are supported on their overhanging top chords or on extended bottom chords that form an internal gutter.

- The central hub of a building where several wings converge.

- Trusses with vaulted or raised ceilings.

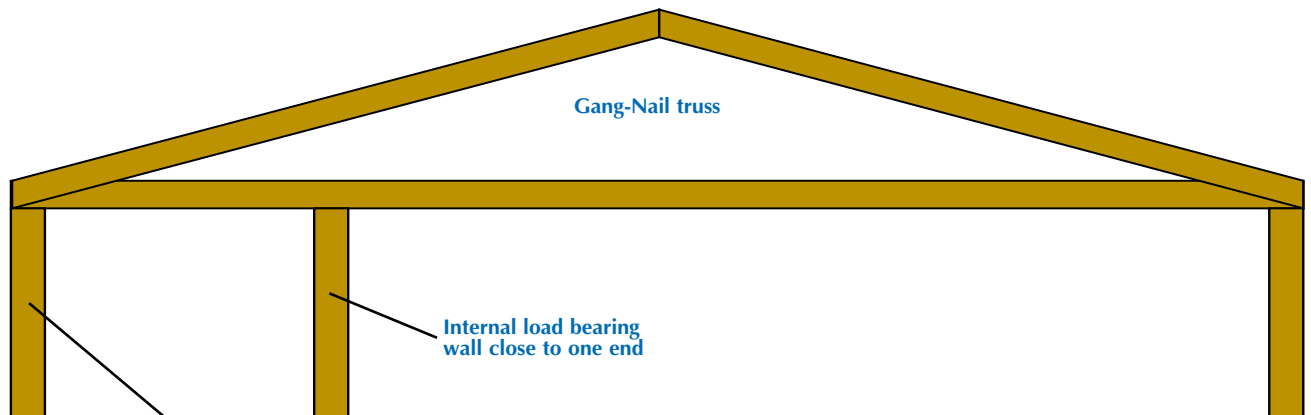
- Trusses with large spans (above 12m) or shallow pitches (below 10°).



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the overall expected truss deflections (See Figure 1).

Consequently, as most external walls, beams and truss fixings are not designed



The reaction at this support will tend to be negative because of the close proximity of the internal support wall.

Figure 1

performance and cost of the structure.

Large spanned trusses, especially those with a heavy load (eg. girder trusses) and shallow pitch, incur a severe penalty by way of cambers.

It is rarely convenient to wait for truss cambers to come down before cornices are fixed.

Most gibstoppers reject the suggestion of fixing cornices only to the ceiling and not to the walls.

Consequently, cornices sometimes get crushed when trusses with large cambers are situated over non-load bearing internal walls.

Under a competitive

external wall frames and lintels since the effective truss spans are reduced.

Internal load bearing walls should not be incorporated when cambers are already under control, as it will actually increase the overall cost of construction.

It is only appropriate mainly where large cambers are expected over where internal walls are present.

Examples where internal load bearing walls should be considered include the following situations.

- Institutional and residential buildings such as schools, hospitals, hotels and rest homes where a central

- Moderately loaded girder trusses.

There is one important trap for fabricators to beware when designing trusses with internal supports.

The reactions at all supports should be in the same direction under the same load case.

In other words, there should not be any uplift reactions under gravity load. This commonly occurs where an internal wall is quite close to one external wall.

In design, that external wall is likely to sustain a 'negative' reaction which artificially works to reduce

to sustain a 'negative' reaction, these trusses will sag on site.

If this situation is encountered during detailing, it is recommended that the support with the 'negative' reaction be removed from design, even if the wall remains constructed as load bearing.

In summary, a good designer should consider the likely truss layout and implement internal load bearing walls where necessary.

This will result in better truss performance at lower cost to the client.