Meyer TIMBER

WALL FRAMING OPTIONS

As house designs have changed there has been technological progression in most areas. Examples of this are I-joist systems for mid floors and evolution of complex truss software to deal with difficult roof layouts. Wall framing however has remained largely untouched in terms of advancements.

We normally design wall frame elements to AS1684 which replaced the Timber Framing and TRADAC manuals. Again, the information has not changed significantly from the early timber framing manuals. House design has however changed to a reasonable degree, meaning that there are now a lot of instances where specific designs do not comply with AS1684 and we need to be able to size these in a simple manner. A couple of the most common are:

HIGH WALLS

AS1684 allows for maximum wall heights of 3000mm with a concession to 3600mm high if consideration is taken to bracing. With sloping blocks becoming more prevalent there are a lot of new houses where the ground floor slab has a split level of up to 1200mm. With normal GF wall heights of 2700mm it puts the lower area at 3900mm high which is over the code. This does not mean you cannot use high studs, they just need to be designed for the loads. All wall studs need to be able to resist vertical loads, but external wall studs also need to be able to withstand buckling from wind loads. Material with high compressive strength which is straight and true, such as LSL, is a perfect candidate for studs in high walls.

CONCENTRATED LOADS

With more complex roof designs it is now common to get a bearer supporting upper and lower roof and long span floor joists. This high vertical load needs to be supported by concentrated load studs. These are not subject to wind loads as part of AS1684.1 design, so again here, high compressive strength material such as LSL is ideal as a cost effective solution.

BRACING AROUND LARGE OPENINGS

The wall bracing throughout a house needs to be evenly distributed to transfer the wind loads down to the foundations. When you have a number of large openings along a wall of a house there is often little room to put even sheet bracing into the wall. By utilising the lintel (that has to be there anyway) and putting in LVL columns at each end the columns and lintel can be joined together to create a moment resisting frame; that is a portal frame which will resist racking loads. The other main benefit of this is that the base connection of the columns is assumed pinned meaning there are not the excessive tie-down requirements you can get with short wall bracing. This will be dealt with more in an upcoming issue.

When looking at all these instances you must also take into account how this will fit into your production. Common Wall studs for example are normally sized for the worst case scenario. You could have MGP12 common studs supporting full span trusses and F5 studs supporting hip ends but as the wall panels are made in bundle order there could be confusion as to which studs to put where. If this ends up in a mix up it is more costly to fix on site, hence the detailer usually makes the decision to use the higher grade everywhere. The decision on when and where to change and mix up structural elements is based on what the wall frame assembly line consists of. If a plant is fully automated it may be less risky to change common studs based on loading as material is remotely fed to the line, and for specific cases such as concentrated load cases is may be reasonable to use an alternative material.

There is a common recurring theme that is working its way into all the fact sheets so far; timber can do a lot more than we are currently designing for in frame and truss plants. If there are designs outside of the code, rather than passing them back to the structural engineer on the project (who will normally make it steel) consult your local timber engineer (Meyer, nailplate companies, etc.) to look at a specific design. If the scenario comes up regularly then we will be able to provide a system solution or a span table to allow you to specify the correct product and put more timber into the project.

George