NOVEMBER 2008

GANG-NAIL GUIDELINES No.137

ANOTHER MITEK ADVANTAGE

AN IMPORTANT LINK IN BRACING

In Guideline 81, Dean Ashton gave an overview of how a building is braced against wind forces and the flow of these forces.

In Guideline 98, I followed with the importance of connecting the brace wall effectively at the bottom plate.

In this article, I want to focus on the other important link at the top of this chain of load transfer, namely the "Shear Connection" (See Figure 1).

The shear connection is a requirement of AS1684 for an effective restraint between the top of all internal non-loadbearing bracing walls and the roof trusses above.

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The blocks are directly fixed to the internal wall but not to the trusses.

To allow free vertical movement of the truss and yet be able to support the wall from face loads (such as from doors opening and shutting), an internal wall bracket (IWB) is used to attach the truss to the shear blocks (See Figure 2).

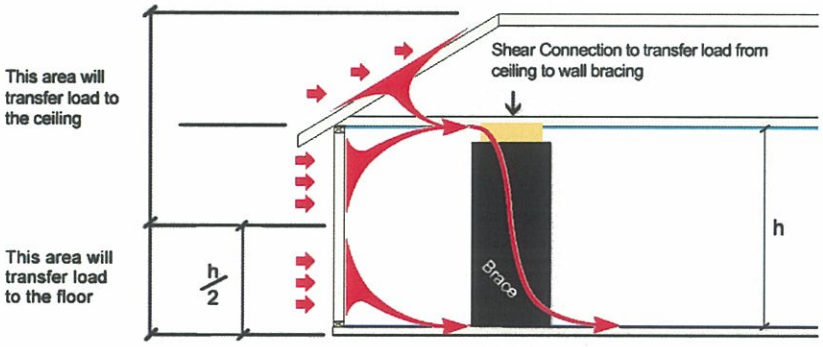

Figure 1
Distrbution of Wind Racking Forces

External frames do not require additional shear connections because truss tie-downs provide adequate fixing.

Since non-loadbearing walls must have a gap to the roof trusses above to permit settlement, this shear connection has to be strong enough to resist racking forces and yet allow free vertical movement of trusses.

Selecting the appropriate shear connection is important and AS1684 contains 11 different basic options of shear connections with many variations for each of the 6 common timber joint groups.

The most commonly used method, when it is actually done, involves sandwiching the bottom chord of a truss (or a trimmer fixed across truss bottom chords) between two short timber blocks.

■ *Right: Internal Wall Bracket and Shear Blocks.*

An IWB is not strong enough by itself to transfer the wind forces from the ceiling diaphragm into the internal bracing wall, which is why shear blocks are required.

There are proprietary products available which combine the function of the shear block and IWB into a single shear connection.

The use of shear blocks requires the installer to locate on site and cut two suitable pieces of timber (for each connection) and fix them by one of the methods in AS1684.

Fixing is critical, so the installer has to ascertain (as must the certifier later on) the required number, size and type of nails, screws or bolts to be used.

The higher the capacity of the brace wall, the stronger the shear connection is required at the top.

In addition, he has to be sure of having adequate lengths of blocks and fastener spacing to be certain neither the top plate nor shear blocks split in the process.

Nailplate suppliers provide guidelines for truss installation as well as other supporting literature (e.g. The MiTek Guide) to help with selection of the correct fixings of shear blocks by summarising the fixing requirements from AS1684 for the most common types of brace walls.

In extreme cases, some builders and certifiers are simply unaware of the requirements for shear connections and completely omit them in their buildings.

Thankfully, I have observed the blocks being installed more regularly now than ever before.

Nevertheless, I have found the fixing seldom consistent or correct, and the fixing method rarely checked against requirements.

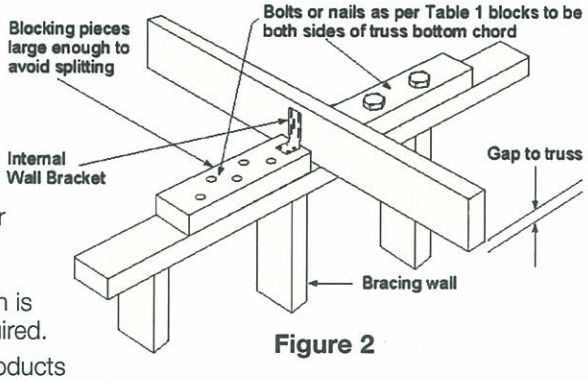

Figure 2

This leaves a gap in an important link between the ceiling diaphragm and bracing wall.

Such an important feature in maintaining the bracing integrity of the structure should not be overlooked by the fabricator, builder or certifier.

For more information, please contact your fabricator or nailplate supplier. TTN