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GN GUIDELINES No. 184

ANOTHER MITEK ADVANTAGE – OCTOBER 2012

TYING DOWN WALL PLATES

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You have heard the saying that a chain is only as strong as the weakest link, and the chain I will be discussing here is the load path from the roof to the foundations (specifically from wind uplift).

The design of roof trusses typically assumes that the supporting structure is stable and capable of supporting all applied loads, up or down.

In uplift, all truss design software calculates the force and nominates an appropriate tie down to anchor a truss to the top plate.

These uplift forces do not magically disappear at the top plate. They must be transferred through the wall structure until they reach the foundation.

Frames that are wholly constructed on site, or prefabricated with ribbon plates to be fitted on site, require the builder to install appropriate connections at regular intervals over the combined ribbon/top plates to the studs.

These same studs must also have similar connections to the bottom plate below (see Connection A in Figure 1). The wall frames must finally be properly anchored to the foundation floor.

In selecting a suitable top plate from AS1684 or sizing it by using design software, the designer will be expected to nominate "Tie Down Spacing".

This is the spacing between the straps that has to be installed on site to tie the top plate to the studs.

The further apart they are the greater the distance the top plate has to span in uplift.

The net uplift force at each tie has to be calculated and used to select a connector with an appropriate capacity.

As with all structural building products, it is wise to only choose reputable engineered building products that have been tested and certified.

Too many homes have been tested by strong winds and found wanting because substandard connectors were used.

But what is not obvious to some is that the top plate tie down also applies above doors and windows.

Again, uplift forces do not magically disappear at the top plate level.

The top plate must be securely tied to the lintel at regular intervals if they are directly next to each other.

If there are jack studs in between them (ie: when the lintel is directly above the opening), the top plate has to be tied to the jack studs and the jack studs have to be tied to the lintel as well (see Connection B).

In addition, the top plate at the ends of every lintel must have a sturdy connection to the jamb studs to resist the full wind uplift from the lintel (Connection C).

To calculate the required tie down capacity to the jamb stud, use the greater of the lintel span or top plate tie down spacing as the "Tie Down Spacing" described earlier.

However, if the lintel is supporting a girder truss or any other concentrated load, a more detailed calculation will be required.

In summary, we recommend that you understand the top plate tie down requirements in AS1684, supply or use only certified structural connectors, seek engineering assistance whenever you are unsure and maintain full communication between fabricator and builder. TTN

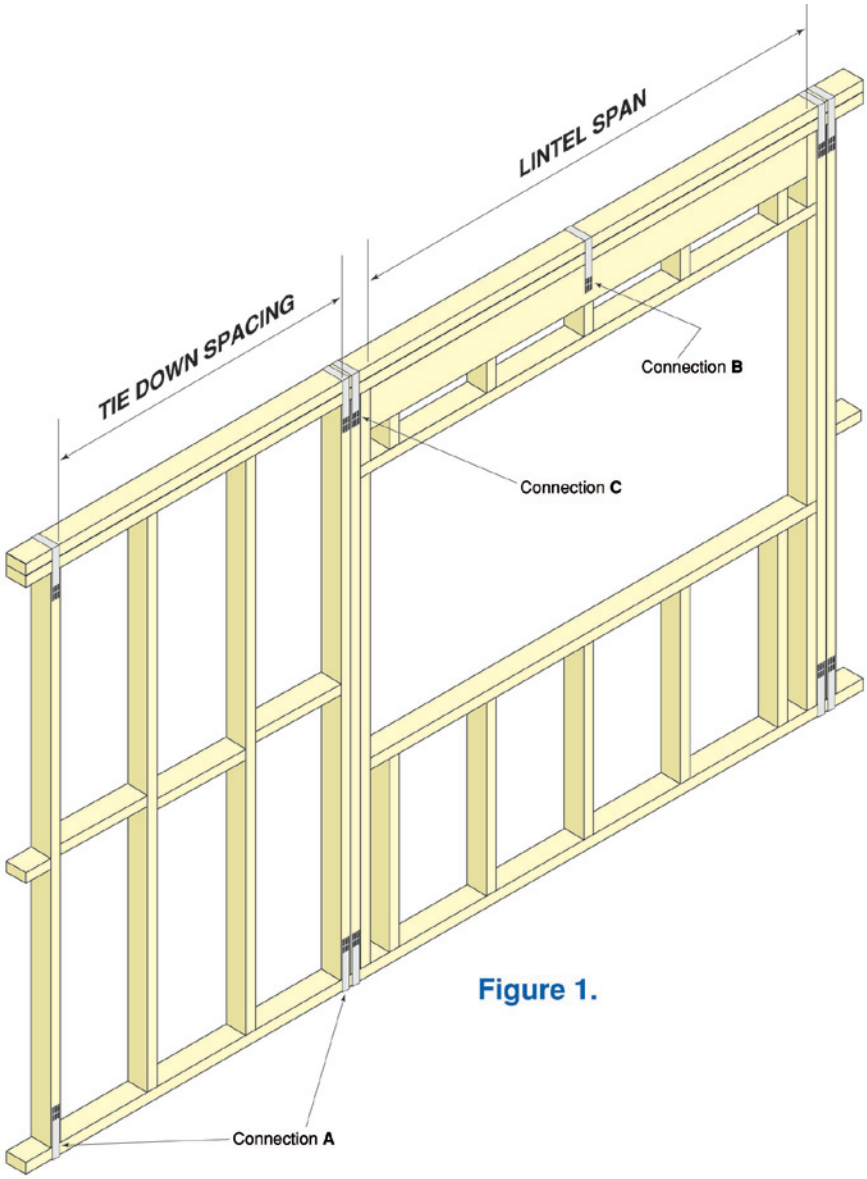

Figure 1.