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HOLDING DOWN WALL BRACING

In addition to the vertical upward and downward forces that must be considered in design, lateral (or horizontal) wind force is another structural action that must always be taken into account.

A potential 'weak link' in bracing walls was first raised in GN Guideline No 98 and this is a continuation from that discussion.

An underlying wall structure is expected to be capable of supporting the floor and roof above and must be braced and stable in its own right and designed so as not to roll over.

Conversely, this situation should also be reciprocated when the walls are on top of the floor.

Not only must the floor be able to take the weight of the walls and all that is above, it must also be able to resist any overturning action from the bracing walls on top of it.

The bracing walls prescribed in AS 1684 may be divided into nominal bracing walls (up to 0.75 kN/m capacity with plasterboard lining only), moderate bracing walls (up to 3.4 kN/m capacity with nominal tie down fixing) and high capacity bracing walls (above 3.4 kN/m capacity requiring specific tie down).

In the first two cases, the overturning forces are sufficiently moderate not to require special attention.

It is the situation with high capacity bracing walls which attracts our attention.

AS 1684 describes various methods of constructing high capacity bracing walls by cladding with hardboard or plywood sheets and provides a range of these examples in Table 8.18.

It also tells us how to calculate their associated overturning forces and offers a selection of tie down methods in Table 8.24 on how to fix and tie down the bottom of bracing walls.

After this point, AS 1684 becomes silent about the capacity of the floor structure in supporting the overturning forces from a bracing wall above.

When you consider that the overturning load from a plywood bracing wall starts from 13kN and could go

to as high as 20kN, which is about equivalent to the weight of a car, then you have some idea of the magnitude of the problem.

Of course there is some load sharing happening but these numbers are just too big to be simply ignored.

Some consideration should be given to maintaining the continuity of the load path to ensure that all links in the chain are sound until the forces are dispersed into the foundation.

There is not much point in having a 13kN anchor fixing a plywood bracing wall to a floor joist (or two) if the joist is not strong enough to carry the load.

There are two ways of dealing with this.

The preferred way is to avoid using

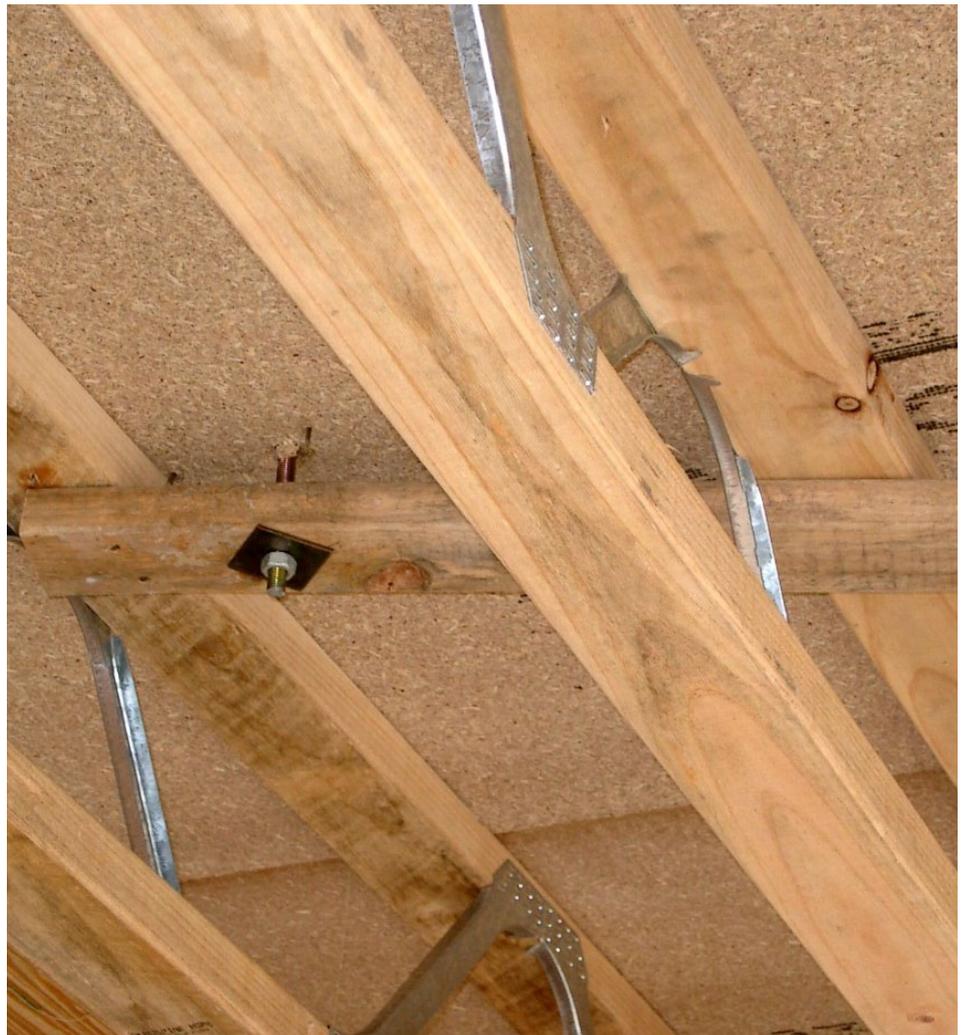
plywood bracing walls in internal partitions supported by floor joists.

Locate all plywood bracing panels along external walls where the forces from anchor fixings can be directly transferred to the lower storey walls or bearers below and use only nominal sheet braced and cross braced panels in the internal walls supported by floor joists.

In that way, no extra consideration of the floor joists would be necessary.

However, if you find yourself short of bracing capacity and the internal walls have to be clad in plywood as well, my recommendation is to consult your engineer to check the capacity of your floor system to support the overturning loads from these walls.

TTN



■ Can the floor joist carry the load?