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# Tensioned Wall Bracing Straps-are you in compliance?

“Do the tensioned wall bracing straps you use comply with AS1684?” This is a question every builder and timber wall frame manufacturer have to answer by the end of this article.

As you may or may not already be aware, installing post tensioned diagonal metal straps to the face of prefabricated timber wall frames is one of the most common and cost-effective ways of bracing a timber stud wall within a timber framed residential building.

However, in order for the structural wall bracing to be effective at providing the required bracing capacity expected, the steel straps must be made of a compliant steel grade and size (net cross-sectional area), as well as being properly installed and tightened.

With a vast range of steel straps currently available in the Australian market, all looking very similar but some of which are cheap, non-structural varieties targeted for general home handyman use, it is all the more important that all reputable wall framing manufacturers make sure they supply bracing wall panels which are fully compliant with Australian Standards.

There are two types of metal straps AS1684 specifies as suitable for use in structural wall bracing. Let us look at each

strap in turn, and note their minimum requirements in the two examples at the bottom of this page.

What is meant by “Minimum net cross-sectional area”? This means the remaining effective cross-section of the steel strap, after any voids from penetrations/holes have been deducted from the gross cross-sectional area. In layman terms, this is essentially what is left of the steel at the thinnest, narrowest point, capable of sustaining any axial forces in the metal strap.

The best way to visualise this is by looking at an example of minimum net area calculation of the steel strap shown in the example at top right. As we can see from this sample calculation, a 30 x 0.8mm strap with a 6.5mm diameter hole for a tensioner, has a net area that satisfies 1.5kN/m wall bracing in AS1684.2 Table 8.18 (b), but not 3.0kN/m wall bracing in Table 8.18 (d).

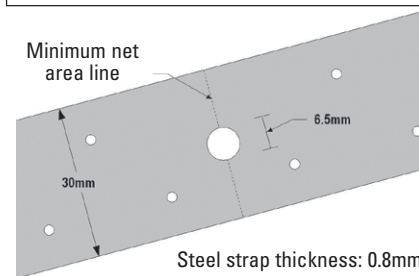
Table 8.18 (d) is often misread to believe that any 30mm x 0.8mm steel strap can be used. It considers the presence of a single small connector nail hole, but not multiple side-by-side nail holes which combine to reduce the net cross-sectional area, nor any large tensioner holes.

Another important criterion for a compliant

Gross area of strap = 30mm x 0.8mm = 24mm<sup>2</sup>

Lost area from biggest hole in the strap = 6.5mm x 0.8mm = 5.2mm<sup>2</sup>

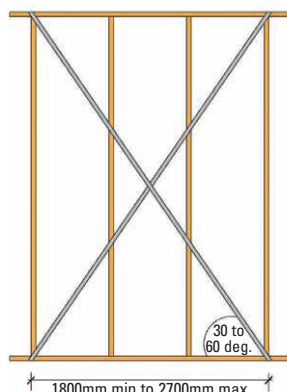
Minimum net area = Gross area - Area of hole  
= 24mm<sup>2</sup> - 5.2mm<sup>2</sup>  
= 18.8mm<sup>2</sup>



metal strap is its steel grade and corrosion protection, which are clearly specified in clause 1.15 of AS 1684.2.

As the steel grade governs the tension capacity of a strap as much as its net area, so it is equally important to ensure that the steel grade is equivalent to G300 or above. The thickness of zinc coating meeting a minimum of Z275 is equally as important to ensure adequate durability for the expected life of the building. Cheap, imported straps, that although look and smell the same, often do not meet one or both of these standards.

Specifying structural metal straps whose manufacturers publish and guarantee the steel material and minimum net cross-sectional area in compliance with Australian Standards, is a critical step in ensuring a building meets its design working life and putting your mind at ease. Have you now adequately answered the question at the beginning? **T**



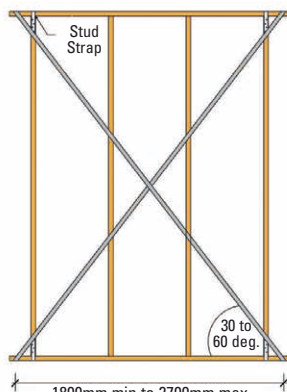
Type of bracing: Metal straps - Tensioned

Reference: AS 1684.2 Table 8.18 (b)

Bracing capacity: 1.5kN/m

Minimum metal strap specifications:

- Net cross-sectional area: 15mm<sup>2</sup>
- Steel grade: G300
- Corrosion protection: Z 275



Type of bracing: Metal straps - Tensioned - With stud straps

Reference: AS 1684.2 Table 8.18 (d)

Bracing capacity: 3kN/m

Minimum metal strap specifications:

- Net cross-sectional area: 21mm<sup>2</sup>
- Steel grade: G300
- Corrosion protection: Z 275

Note: Stud straps required at each corner

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