



By Tim Rossiter, state manager, NSW and WA

# When is 'flat' flat enough?

A regular enquiry we engineers in the truss industry receive is about a 'flat' ceiling, or the lack thereof! Aesthetic judgements about a suitable surface finish are inherently subjective; to quote Al Neuharth, "the difference between a mountain and a molehill is your perspective."

It is true a truss may occasionally have an unusual deviation along its span caused by a wide variety of possible issues - Ref GN Guideline #120 for a checklist ([www.mitek.com.au/Publications/GN-Guidelines/Design-and-Installation](http://www.mitek.com.au/Publications/GN-Guidelines/Design-and-Installation)). The first point to appreciate though is that trusses don't float in the air! Truss levels are at the mercy of the straightness of their wall supports.

Supporting walls are framed with pre-cut studs of a uniform length to ensure a consistent height. Like trusses, wall frames do not float in the air, and their shape also follows their support. (The straightness of the top plate is furthermore affected by natural lintel deflections under load.)

We now come to the slab level. Did you know the levelness of the concrete slab has a direct effect on the levelness of the ceiling? When we are told the slab is 'as good as can be expected', is it reasonable to expect the ceiling to be flat enough to play competition billiards on, if the room was upside down!?

So what are the 'rules'? Every state and territory has guidelines for dealing with construction disputes. Tolerances of finish are no exception, and concrete slabs are definitely included (See Table 1 for various state definitions and references you can download for future use).

Of course, a diligent team of carpenters (who are sufficiently paid to spend the time) could pack under the wall frames and/or over the top plates to improve the straightness of truss supports. But is it their responsibility? And who pays for it when the slab is not within tolerance? **T**

State/Territory Reference Document	Relevant Clause
<b>NSW/ACT</b> <b>NSW Guide to Standards and Tolerances</b>	<b>2.8 Levelness of concrete floors</b> Except where documented otherwise, new floors are defective if, within the first 24 months of handover they differ in level by more than 10mm in any room or area, or more than 4mm in any 2m length. The overall deviation of floor level to the entire building footprint shall not exceed 20mm. Refer to Item I of this Guide where the new floor is to abut an existing floor.
<b>Qld/NT</b> <b>Qld Standards and Tolerances Guide</b>	<b>2.8 Levelness of concrete floors</b> Except where documented otherwise, new floors are defective if within 12 months from completion of the works they differ in level by more than 10mm in any room or area, or more than 12mm in any 3m length and such deviation adversely affects the safe use or reasonable amenity of the building.  The overall deviation of floor level to entire building footprint shall not exceed 20mm within 12 months from date of completion of the work and such deviation adversely affects the safe use or reasonable amenity of the building.
<b>Vic/SA</b> <b>VIC Guide to Standards and Tolerances 2015</b>	<b>2.08 Levelness of concrete floors</b> Except where documented otherwise, new floors are defective if within the first 24 months of handover they differ in level by more than 10mm in any room or area, or more than 4mm in any 2m length. The overall deviation of floor level to the entire building footprint shall not exceed 20mm.
<b>WA</b> <b>WA Slab tolerance</b>	<b>What are the tolerances relating to flatness?</b> The flatness of finished concrete floors can be controlled through good supervision and site practices. Areas of concern are generally dips or bumps in floor finishes and excessive ramping at thresholds to wet areas. When assessing the flatness of concrete slabs, the Building Commission refers to Clause 17.5.2.4 of AS 3600-2009 Concrete structures which states: "The deviation of any point on a surface of a member, from a straight line joining any two points on the surface, shall not exceed 1/250 times the length of the line."  When assessing tolerances relating to the flatness or cracking in concrete slabs, consideration is also given to the defect's location, serviceability of the floor for its intended use and if the floor finish is not suitable for the documented applied finishes.
<b>Tas</b> <b>TAS Guide to Standards and Tolerances 2017</b>	<b>2.08 Levelness of concrete floors</b> Except where documented otherwise, new floors are defective if within the first 24 months of handover they differ in level by more than 10mm in any room or area, or more than 4mm in any 2m length. The overall deviation of floor level to the entire building footprint shall not exceed 20mm.

Table 1

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