TO THE CODE . . .

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When comparing pricing of frames and trusses the buyer often "specifies" – "do it to the Code, mate". As with all things, quality is the choice of the purchaser and different manufacturers will vary the amount they do beyond code requirements.

Take cars for instance – the "code" is to make a vehicle that gets people from point A to point B but we all know that there is a vast difference between a Magna and a Mercedes!

So it is with frames and trusses.

The impression may be that if they are all "to the code" then they're all the same.

The final owner of the house seldom gets to see them, and pressure is sometimes applied to reduce price so that the items the home-buyer can see will be improved.

Let's examine then what "to the Code" actually means. There are two main requirements for any element of a structure – strength and serviceability.

The strength part is whether or not something breaks, which when referring 'to the Code', means, make sure it stays up when loaded!

Serviceability has been the subject of previous articles and many disputes – and means, how it will look.

While there are no definitive serviceability limits in the timber design code (AS1720), the Australian Standard for Light Timber Framing AS1684.1 sets out the limits that have been assumed in creating the Framing Tables used for all timber elements.

Thus there is an 'accepted' set of limits in the industry and these are what are applied when designing "to the Code".

The following table sets out some common components and the deflection limits set in AS1684.1; some may be a bit of a surprise.

The Span ratio is calculated by dividing the member's span by the ratio given e.g. for a rafter spanning 2400 with a span ratio of 300 the max deflection acceptable is 2400/300 = 8 mm. The lower of the span ratio and the limit governs.

Hence for a two-storey structure the acceptable total "code" deflection at the upper top plate would be up to 44 mm in the worst case as shown in diagram 1. That is not even considering potential for variations in concrete slabs.

In a recent case a fabricator was confronted over an unacceptable floor deviation where there was a 17 mm difference in the floor from when a bedroom door was open to when it was closed, the first item to be blamed was the floor joists.

However, further investigation found that (in essence) the slab was

out by 10 mm between the two supports of the joists and the joists had an acceptable deflection of 8 mm – total 18mm.

In their own right each supplier is within "normal" limits.

Another example was a house in construction with tall walls (over 3000mm). The builder was concerned because he could "rattle" the frame by hand and thought that they were too flimsy.

Checking the code for a stud, the limit for deflection under wind load is Stud Length/150 up to a maximum limit of 20 mm – this means that when the wind blows the wall can bow inward (rattle) up to 20 mm and still be "to the code".

The studs were well within this capability, but the impression to the customer was poor quality.

The problem with serviceability limits is that one mans ripple is another man's tidal wave.

The control should be in the hands of the manufacturer who sets what they will accept in their finished product.

However, if the customer will not

Element	Span Ratio	Absolute Limit (mm)	Span at which the absolute limit governs
Floor Bearer	300	12	3600
Floor Joist	300	15	4500
Top Plate	200	3	600
Bottom Plate	200	3	600
Lintel	300	10	3000
Rafter	300	None given	
Ceiling Joist	400	12	4800

buy your product because it is too expensive, the manufacturer has to decide on how much they want to maintain their quality. The natural tendency may be to reduce the limits.

Another approach would be to draw the attention of your customer to the items that set your product apart and explain the costs.

One idea being floated in the industry is to set a varying set of deflection limits, call them "level of finish".

Thus an A Grade level would have much tighter restrictions on serviceability than C Grade.

This is already being done in codes for other materials, such as plasterboard.

Another approach would be that at each stage of construction measures are taken to correct any existing acceptable variations.

For example should there be 15 mm of slab variation – pack under the walls, or if the top plate has a couple of mm deflection and the lintel has 9 mm – pack under the heels of the trusses, etc.

It's a lot simpler to get each stage straight when it is being built than when the whole house in completed painted and lived in.

Bottom line – get familiar with "to the code" and all its inherent ramifications.

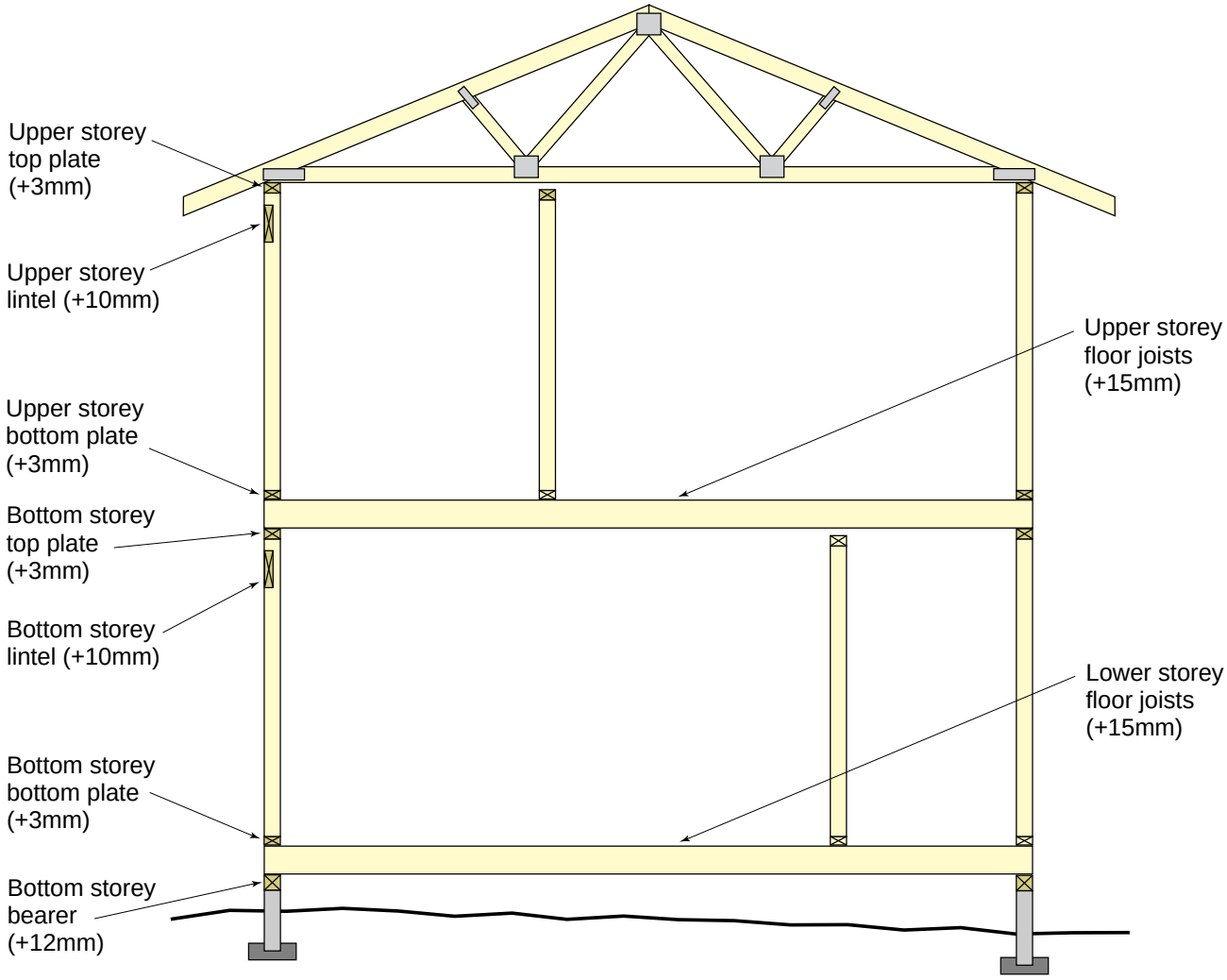

Diagram 1 : Typical Section