BUILD RIGHT

Tolerances tables

BY BRUCE SEDCOLE,
ANZIA, BRANZ TECHNICAL WRITER

In *Build* 156 *Tolerances tables*, we outlined some of the allowable construction tolerances for a quality result. We have now revisited this information and added some more for plasterboard and fibrous plaster, an area that can cause disagreements between contractors and clients.

A CONSTRUCTION TOLERANCE is an allowable variation in something that can be measured. This may be:

- the permitted variation from a given dimension or quantity
- the range of variation permitted in maintaining a specified dimension
- a permitted variation from location or alignment.

While these tolerances are a permitted deviation from perfect, the aim is always to be accurate when constructing and finishing a building. Taking everything to the outer tolerance limit may make achieving quality difficult for following trades.

References to MBIE in the tables refer to the MBIE *Guide to tolerances, materials and workmanship in new residential construction 2015*, which is available from www.building.govt.nz.

Table 1

SITUATION	ACCURATE TO WITHIN:	REFERENCE
BUILDING SET-OUT		
Location on site	15 mm of the specified location on a site plan	NZS 3604 Table 2.1
Deviation from vertical	15 mm per 2-storey height (5 mm per 2.4 m)	NZS 3604 Table 2.1
CONCRETE SLAB ON GROUND		
Deviation from prescribed finished floor level	±5 mm from finished floor level	NZS 3109 Table 5.2
Surface level	±3 mm in any 3 m of length	NZS 3114 Table 3

Table 2

ELEMENT	SITUATION	ACCURATE TO WITHIN:	REFERENCE
SUSPENDED FLOORS			
Piles	Concrete piles verticality	13 mm per m of height (i.e. 1:75)	BRANZ
	Timber piles verticality	10 mm of vertical in the first m above ground and within 20 mm of vertical over their total length	BRANZ
	Driven timber piles	15 mm of vertical for every m of length	NZS 3604 section 6.6.6.3
Framing	Floor plane levelness	A slope of no more than 1:200	MBIE
	Suspended floor deflection	1/300th of span under service loads	NZS 1170.0
		1/360th of span maximum (where floors are tiled)	BRANZ

Table 3

SITUATION	ACCURATE TO WITHIN:	REFERENCE
TIMBER QUALITY		
Bow	15 mm in a 2.4 m length of 50 mm thick framing (35 mm for a 3.6 m long member)	NZS 3631 Table 2
Crook	10 mm in a 2.4 m length of 100 mm wide framing (15 mm for a 3.6 m long member)	NZS 3631 Table 3
Twist	5 mm per 100 mm of width in a 2.4 m length of 50 mm thick framing (10 mm for a 3.6 m long member)	NZS 3631 Table 5
TIMBER ROOF FRAMING		
Vertical elements	Deviation of 5 mm for every 2.4 m rise in height	NZS 3604 Table 2.1
Horizontal elements	Deviation of 5 mm in lengths up to 10 m; 10 mm in total for any length over 10 m	NZS 3604 Table 2.1
TIMBER WALL FRAMING		
Deviation from:		
• position on plan	15 mm maximum	NZS 3604 Table 2.1
• line in plan	5 mm for lengths up to 10 m; 10 mm in total for lengths over 10 m	NZS 3604 Table 2.1
• horizontal	5 mm for lengths up to 10 m; 10 mm in total for lengths over 10 m	NZS 3604 Table 2.1
• a flat plane across face of wall	≤6 mm gradual bow at mid-height under 3 m long horizontal straight edge	NZS 3604 Table 2.1
Inter-storey relative displacement of loadbearing walls	5 mm for vertical alignment	NZS 3604 Table 2.1
Permitted bow in studs at right angle corners	2 mm in 2.4 m in both studs	NZS 3604 Table 2.1
Permitted bow in studs	≤6 mm gradual bow in 2.4 m	NZS 3604 Table 2.1
Verticality of frames	5 mm for every 2.4 m rise in height	NZS 3604 Table 2.1
Alignment of wall framing	1.5 mm for every 1.3 m or 6 mm over 3 m using horizontal straight edge at mid-height	NZS 3604 Table 2.1
TIMBER FLOORING		
Finished floor	Slope no more than 1:200	MBIE
	5 mm maximum deviation from level in any 10 m length; 10 mm in total for lengths over 10 m	MBIE
Flooring – individual sheets or boards	Flat and straight to within ±6 mm for every 3 m of length	MBIE

Table 4

Plasterboard or fibrous plaster

SITUATION	ACCEPTABLE	REFERENCE
FIXINGS		
Popping visible from normal viewing at handover (level 4 or 5 finishes)	No	MBIE
Popping that breaks the surface	No	MBIE
Popping of fixings (outline visible under the finish) occuring over a period of time after handover but not visible from normal viewing position	Yes	MBIE
FINISH		
Blistering or peeling of compounds to substrate or between coats	No	MBIE
Finish of flush-stopped lining does not meet level of finish specified (level 4 is the default level of finish unless otherwise specified in the contract)	No	MBIE
CRACKS		
Cracks visible from normal viewing position (level 4 and 5 finishes)	No	MBIE
Fine cracks ≤0.5 mm not visible from normal viewing position (fine cracks may be expected within the first 12 months)	Yes	MBIE
Unrepaired cracks >0.5 mm, (for example where stair stringer abuts wall lining)	No	MBIE
JOINTS		
Joints between wall and ceiling and between ceiling linings – not the same level of quality as surrounding surfaces	No	MBIE
Joints between sheets clearly visible from normal viewing position at handover in flush-stopped wall or ceilings of level 4 or higher finishes	No	MBIE

Note: The normal viewing point for painted non-concrete wall surfaces is standing at a distance of ≥2 m (see MBIE's *Guide to tolerances, materials and workmanship in new residential construction 2015*).