

6.4 Timber and concrete upper floors

Appendix 6.4-A

Span tables for solid timber floor joists

Tables 1 and 2 in this Appendix are derived from a TRADA Technology Ltd. publication "Span tables for solid timber members in floors, ceilings and roofs (excluding trussed rafter roofs) for dwellings".

The section sizes of the floor joists given in Tables 1 and 2 should be regularised, or be ALS or CLS to enable floors and ceilings to be level.

For upper floors with a 22mm thick chipboard decking and 12.5mm plasterboard ceiling, a dead load of between 0.25kN/m² and 0.5kN/m² may be assumed. Use the centre three columns from the tables.

For timber floors between dwellings, the dead load of the construction to meet acoustic performance is likely to be within the range 0.6kN/m² to 0.7kN/m², therefore use the three right-hand columns.

These tables are based on design criteria which may permit a deflection of up to 14mm. Floors based on these tables require strutting in accordance with [Sitework clause 6.4 - S8](#).

Lightweight non-loadbearing partitions which weigh no more than 0.8kN (81.5kg) per metre run and are parallel to the joists may be supported by one or two additional joists placed immediately beneath them. The partitions should be fixed through the floor decking into the joist(s) beneath. For the unshaded areas of Tables 1 and 2 one additional joist is sufficient; for the shaded areas, two additional joists are required. For similar lightweight partitions which run at right-angles to the joists, the maximum spans in Tables 1 and 2 should be reduced by 10%. For all other additional loads, joist sizes should be designed by an Engineer in accordance with [Technical Requirement R3](#).

Table 1 - Permissible clear spans for domestic floor joists - strength class C16

Imposed load not exceeding 1.5 kN/m²

Service Class 1 or 2

Table 2 - Permissible clear spans for domestic floor joists - strength class C24

Imposed load not exceeding 1.5 kN/m²

Service Class 1 or 2

Appendix 6.4-B

Protection from corrosion of metal components embedded in masonry

Metal components, other than wall ties built into masonry, should be made of a material listed below and protected in the way described in Table 1. Reference should be made to Table 2 for guidance on which category of material and protection to use.

Table 1 - Materials for metal support and restraint components and recommended protection levels

Durability Category	Base material	Form	Grade and standard that should be conformed to	Protective measures to be carried out after fabrication
A	Hot-dip galvanized low carbon steel	Sheet	BS EN 10143:1993 Z1 or Z2, coating type G 600. Minimum mass of coating 600 g/m ² including both sides.	All external cut edges to be protected using a one-pack chemical-resistant paint conforming to HF1A to HF2F in part 4 of table 4H of BS 5493 : 1977 and modified to give adequate adhesion to the fixing.*
			BS EN 10143:1993, Z1 or Z2, coating type G 275. Minimum mass of coating 275 g/m ² including both sides.	Coating to be supplied after fabrication to the external surfaces and consisting of either: (a) bituminous solution complying with types 1 or 2 of BS 3416 and of minimum thickness 25µm; <i>or</i> (b) a one-pack chemical-resistant paint conforming to HF1A to HF2F in part 4 of table 4H of BS 5493: 1977 and modified to give adequate adhesion to the fixing.* Where the zinc is removed on internal surfaces during the fabrication, e.g. by welding, further protection should be applied to these areas.
B	Low carbon steel	Strip	BS EN 10111	Post-galvanising conforming to BS EN ISO 1461. Minimum mass of coating of 920 g/m ² including both sides, i.e. 450 g/m ² on any surface.
			BS EN 10025:1993 grade S275JO	
C	Low carbon steel	Strip	BS EN 10111	Post-galvanising conforming to BS EN ISO 1461. Minimum mass of coating of 1880 g/m ² including both sides, i.e. 940 g/m ² on any surface.
			BS EN 10025:1993 grade S275JO	
D	Copper alloys		BS EN 1172	Material other than phosphor bronze to be formed either (a) by bending at dull red heat and allowing to cool in still air; <i>or</i> (b) by cold forming and subsequently stress relief annealing at 250°C to 300°C for 30 min to 1 hour. Effectiveness of stress relieving of cold formed components to be tested by the supplier using the mercurous nitrate test described in BS EN ISO 196.
			BS EN 12167	
	Austenitic stainless steel minimum 18/8 composition and excluding free machining specifications	Strip, bar, rod, tube or wire	BS EN 10088-1	
E	Austenitic stainless steel minimum 18/8 composition and excluding free machining specifications (molybdenum chrome nickel alloys only)	Strip, bar, rod, tube or wire	BS EN 10088-1	

Table 2 - Protection of metal support and restraint components (including wall ties) built into masonry				
Type of component	Situation	Durability category of exposure given in table 1 (material and recommended protection)		
		For buildings not exceeding three storeys	For buildings exceeding three storeys	For buildings located in an aggressive environment (e.g. coastal sites)
Sliding anchors, anchorages, bonding continuous support angles, support brackets and cavity wall ties.	In contact with, or embedded in, an internal wall only	All categories		
	In contact with, or embedded in, an inner leaf of an external cavity wall	C,D or E	D or E	E
	In contact with, or embedded in, an outer leaf of an external cavity wall or a single leaf external wall			
Dowels and restraint straps, joist hangers and reinforcement for non-structural use	In contact with, or embedded in, an internal wall only	All categories		
	In contact with, or embedded in, an inner leaf of an external cavity wall	A,B,C,D or E	A,B,C,D or E	E
	In contact with, or embedded in, an outer leaf of an external cavity wall or a single leaf external wall	C,D or E	D or E	E
Lintels installed with or without a DPC tray	All situations	As specified in BS 5977-2 for the appropriate type of lintel (i.e. installed with or without a DPC tray)	Not normally applicable. If used special precautions may be necessary.	

It is an NHBC recommendation that components in contact with, or embedded in, an inner leaf which is damp or exposed to periodic wettings (eg below dpc) should be protected in the same way as components in contact with, or embedded in, an outer leaf.