

Spans

Span tables should be used to determine size of a timber member of a particular strength class that is required for a given span. Changing the distance between the centres of the timbers will change the span distances for a timber of the same sizes.

The following is an example which applies to solid timber members showing how to use span tables for domestic floor joists at 600mm centres.

Size of Joist (mm)	C16 clear maximum span (m)	C24 clear maximum span (m)
38 X 97	1.31	1.66
47 X 97	1.68	1.90
38 X 220	3.67	4.17
47 X220	4.20	4.58

So if you wanted to span 4 metres at 600mm centres, you could use 38 x 220mm C24 instead of 50 x 220 C16, a lighter weight option.

Span tables showing timber sizes and strengths can be obtained from www.trada.co.uk

When using engineered joists such as I-Joists, you should refer to the manufacturer's own literature and span tables.

Building In / Hanging Joists

Joist can be hung in various ways, either built into the inner leaf of blockwork, into the walls of timber framed kit, or hung on joist hangers.

If you are choosing to use joist hangers, the hangers must be of the correct type for the strength of the blockwork being used or timber it is being fixed to and should never be adapted. You should always check the requirements of the product you are using. The back plate of the hangers must be in contact with the face of the mounting surface for the whole height of the hanger, and the hanger must be vertical. Joists must be accurately cut to length – the maximum overall tolerance is 6mm.

Joists that are to be built in must be placed directly onto the blockwork or kit and not onto any bedding or compressible material. They must also be accurately cut to length so that while it does not extend into the cavity, it is fully supported by the full width of the leaf into which it is built.

In blockwork the masonry must be accurately cut to allow an even mortar joint of 10-15mm all around the sides and tops of the joist. The mortar joint is to be struck or recessed, to allow the later installation of a bead of mastic between the blockwork and the joist. The mastic must be sufficiently generous to cope with any shrinkage in both the masonry and the timber. The blockwork supporting the joists is to be accurately built to level. Ideally packers should not be used, but slate packers will be accepted provided they are accurately cut to the same width of the joist, have a total thickness of not more than 15mm and are recessed to the same depth as the mortar joint to receive the mastic bead. The mastic bead must be installed after both the joists and the masonry are reasonably dry. Ideally this should be done after the roof has been installed.

Please note that this leaflet is merely intended to provide supplementary guidance. Should you have any doubts about whether any work requires a building warrant or whether it complies with current regulations please consult the Building Standards Section at the number shown below.

Please also note that works of the nature included in this leaflet may still require a Building Warrant.

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Comhairle nan Eilean Siar



Development Department
Sandwick Road
Stornoway
Isle of Lewis
HS1 2BW

Stornoway
Phone: 01851 822692

Balivanich
Phone: 01870 604990
Web: www.cne-siar.gov.uk



Building Standards

Floor Joists, Hangers, & Notching / Drilling for Services



The purpose of this leaflet is to provide additional guidance on the installation of floor joists and any works to floor joists, in accordance with the current building regulations.

Please take one.

Should you need further assistance then please do not hesitate to contact one of our Building Standards officers.

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Stornoway
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Balivanich
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General

It is necessary for both new dwellings and any extensions, alterations, or conversions carried out to have the works carried out in accordance with the technical standards. One of the considerations which should be made is to the selection of, the hanging of and the adaptation of floor joists. To give an example of how a joist may require to be adapted, it may be necessary to run services through a joist.

If you can not gain access to any of the resources outlined in this leaflet then please feel free to ask to speak to one of our officers for further advice.

Types of Floor Joist

Floor joists can come in a wide range of sizes, strength classes and materials. This can vary from a standard timber C16 strength timber floor joist to I-Joists, which are structurally engineered timber joists combine high-grade softwood flanges with an engineered composite panel web, usually made of sterling board. Or alternatively there are other types of engineered joists available which are composed of timber flanges with a steel web and also joists which are composed of lightweight steel.



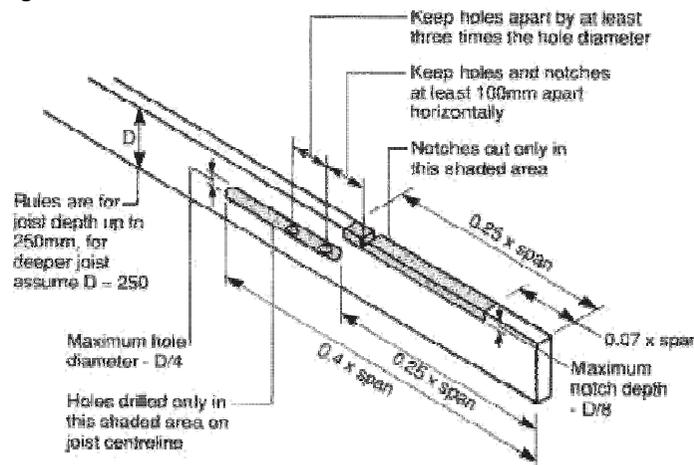
You should always ensure that you have selected the correct type and strength class of structurally graded joist to carry the necessary loadings. In most cases this will require an expert to be involved.

Services Through Joists

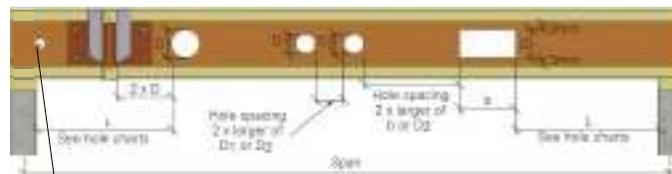
If you are to be notching or drilling through a joist for services to pass through, then the sizing and positioning of any notching or drilling must be considered carefully.

Please bear in mind that if you are using engineered timbers with a steel web then the web should not be cut, however cutting should not be necessary anyway as services should be able to pass through the gaps in the web. Please also bear in mind that the flange of an engineered timber joist should NOT ever be cut.

You will find detailed descriptions of what sizes of holes/notches can be made and where they can be made in standard timber joists in the guidance available on the TRADA website (www.trada.co.uk). A diagram is also shown below:



For information on what sizes of holes can be made and where they can be made in JJI joists, detailed information can be found in the JJI Joist Technical Manual - Third Edition, Page 8, which can be found on the JJI website (www.jji-joists.co.uk). A diagram is also shown below.



A 35mm hole may be drilled anywhere on the centre line of the web material provided there is a minimum of 35mm from the edge of the hole to the end of the joist

Notes for I-Joist Diagram:

1. Where more than one hole is to be cut, the minimum spacing between holes should be 2 times the width of the largest hole.
2. Cut hole on the centreline of the web where possible.
3. The rectangular hole width b should not exceed 1.5 times the height D .
4. Cut all holes carefully. Do not over-cut and do not cut the flanges.
5. Plastic plumbing is ideal for use with JJI-Joists. Where copper plumbing is to be used, careful consideration of the sequence of pipe installation is required.
6. Refer to Technical Bulletin No.7 for more comprehensive Hole Charts.

Strength Classes & Spans

Strength grading is a way of assessing the strength of a piece of timber, which depends on its species as well as its grade and it is necessary to ensure that timber is strong enough for the particular job. To make specifying easier, species and grades are grouped into strength classes of similar strength. Strength classes range from C14 to C50 for softwood and D30 to D70 for hardwoods. The higher the number, the stronger the timber.

Strength grading can be carried out visually or by machine. However visual strength grading should only be carried out by experienced experts. Each piece of graded timber is stamped with a mark showing information on the timber (examples are shown below).

