HOLES AND NOTCHES IN JOISTS

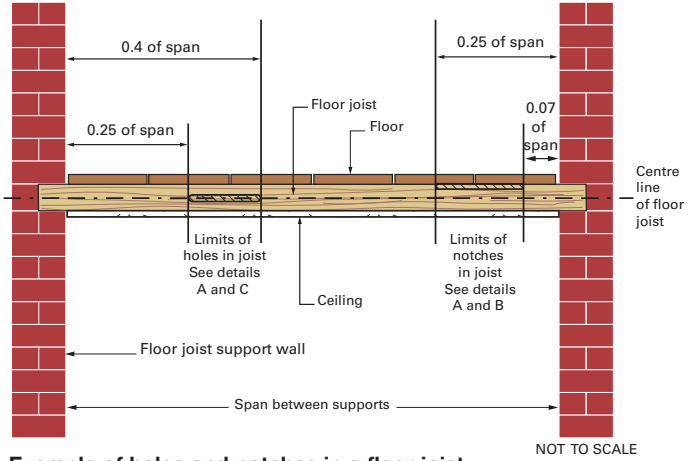
Electrical installers carrying out work in dwellings and other small buildings of traditional construction often need to notch or drill holes in joists for the passage of cables and/or their enclosures. However, as required by Regulation 522.8.14 of *BS 7671*, no wiring system should penetrate an element of building construction which is intended to be load bearing unless the integrity of the load-bearing element can be assured after such penetration.

Guidance to prevent damage to the building structure when notching or drilling simply supported* floor and roof joists in low-rise buildings is provided in *BS 5268-2: 2002*† and *BS 8103-3: 2009*.

BS 5268-2 Code of practice for permissible stress design, materials and workmanship recommends that the effect of holes on the stability of the structure need not be calculated in simply supported floor and roof joists not more than 250 mm deep, where holes drilled at the neutral axis§ with a diameter not exceeding 0.25 of the depth of a joist and not less than three diameters (centre to centre) apart are located between 0.25 and 0.4 of the span from the support.

BS 8103-3 Structural design of low-rise buildings, Code of practice for timber floors and roofs for housing provides diagrams showing the application of *BS 5268-2* in respect of the maximum diameter of holes, their size and distance from one another, and their position in relation to the supporting walls.

Examples of the application of the above requirements of each standard are illustrated in the diagrams in this Guide.



Example of holes and notches in a floor joist

* 'Simply supported' means that only each end of a floor or roof joist is supported.

† *BS 5268-2: 2002* has been withdrawn and superseded by *BS EN 1995-1-1: 2004+A2: 2014 Eurocode 5. Design of timber structures. General — Common rules and rules for buildings.* However, until the new standard is fully adopted, a building designed using the information given in *BS 5268-2: 2002* is still considered an acceptable way to comply with the relevant parts of the Building Regulations. For further information, refer to the Timber Research and Development Association (www.trada.co.uk).

§ The neutral axis is the centre line of a beam, such as a floor joist.

IET WIRING REGULATIONS UPDATED TO: 17TH EDITION BS7671:2008 Amd 3: 2015

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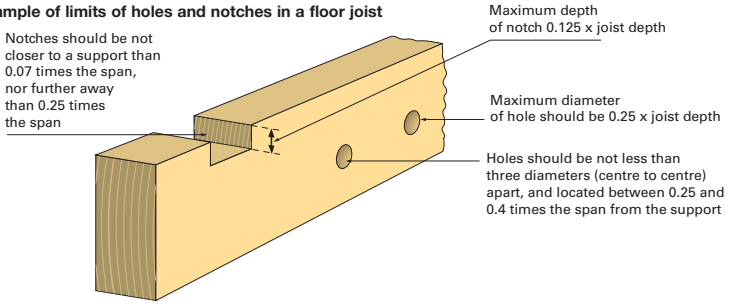
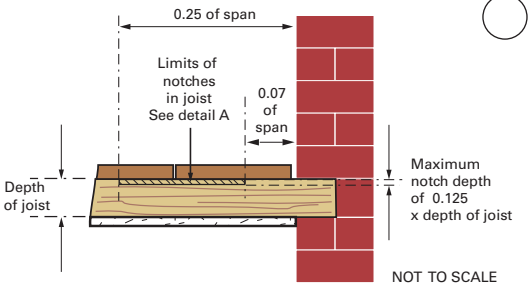
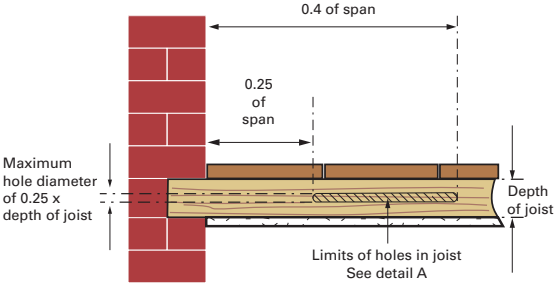
HOLES AND NOTCHES IN JOISTS

Detail A - Example of limits of holes and notches in a floor joist





Detail B - Example of limits of notches in a floor joist



Detail C - Example of limits of holes in a floor joist

NOTES

(1) These are guidelines for solid timber joists. For other products such as I-joists or metal web joists, refer instead to the manufacturers' guidelines. In any event, installers should seek confirmation of the integrity of a joist prior to commencing work.

(2) Existing holes or notches may be used, to avoid the need to form more holes or notches.

(3) Notches may be at the top or bottom of a joist, but not both at the same end. Where notches are limited to the area between 0.1 and 0.2 of the span, the maximum notch depth may be increased to 0.15 times the joist depth.

(4) Unless the structural design permits, holes or notches must not be cut in roof rafters.

(5) Cables passing through a joist within a floor or ceiling construction or through a ceiling support must be so selected and installed in accordance with Regulation 522.6.201, as to protect against damage and consequent danger.

(6) For ease of reference, where a pvc/pvc twin and earth cable passes through a hole in a joist, it should be at least 50 mm measured vertically from the top or bottom, as appropriate, of the joist or batten. (Regulation 522.6.201(i) refers.)

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