

Building Approval - Floors

Good Practice in solid and suspended Floor Construction

Introduction

The information contained in this leaflet has been simplified to provide easy reference and guidance.

It does not give definitive a definitive interpretation of Building Regulations and you are advised to consult with professionals before submitting plans.

All building materials and products used should conform to the appropriate British standards or hold a current Certificate issued by the British Board of Agreement or European equivalent.

Inspection by local authority

You should give one full day's notice for inspection before any concrete or site covering is laid and before the Horizontal d.p.c is bedded.

Domestic group floors

A domestic ground floor may be required to provide one or more of the following functions:

- to support the imposed load of people, furniture and fittings;
- to exclude the passage of water and water vapor from the exterior of the building;
- to provide resistance to unacceptable heat loss;
- to provide the correct type of surface to receive the chosen finish;
- to prevent the passage of sound.

There are many different types of floor construction. These may vary, depending on site conditions.

Common forms of construction are:

a) Ground supported concrete floor

A ground floor construction should achieve a specific thermal value (refer to section headed Heat Loss).

A 1200 gauge d.p.m should be lapped with the wall d.p.c to avoid moisture penetration (see figure 1).

The concrete should be adequately thickened where a non-loadbearing partition is positioned directly above (See Leaflet 7: Walls for more information).

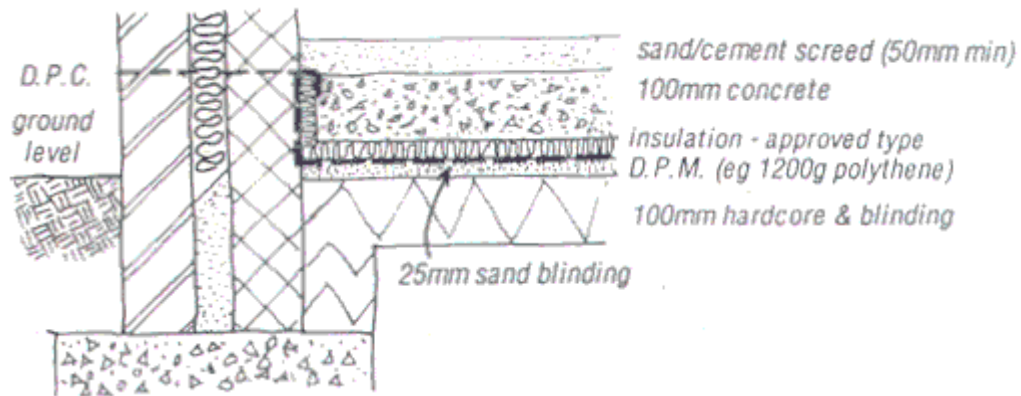


figure 1: ground supported concrete floor construction

b) Suspended precast ground floors

It is recommended that, where fill exceeds a depth of 600mm, a suspended floor construction is used.

The thickness of the concrete floor slab and the positioning of any necessary reinforcement will depend upon its span and the weight and position of intermediate partitions. This will normally be determined by structural calculations (see figure 2).

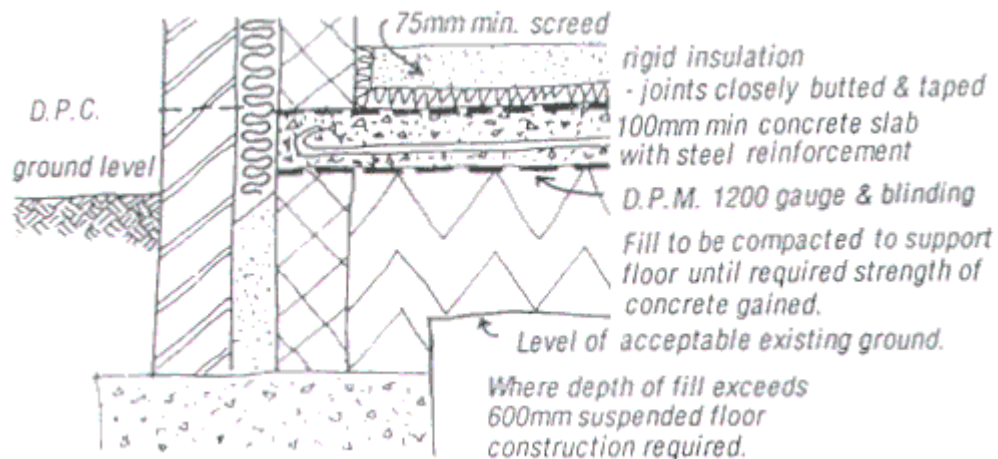


figure 2: suspended in-situ ground floors

For further information, please consult your local Building Surveyor.

c) Suspended precast ground floors

The block and beam flooring system uses equally spaced pre-stressed concrete beams in field with flooring grade concrete blocks. The beams are supported by external and/or cross walls.

Note: Block and beams floors are generally supplied by manufacturers using patent designs. Consequently, their instructions together with the British boards of Agreement Certificate should be consulted with regard to installation of foundations and the ground floor slab. Ventilation of the sub floor void may also be required where there is a risk of an accumulation of gas.

d) Typical suspended ground floor

The area beneath a timber ground floor needs to be provided with adequate ventilation to avoid the build up of moisture. This is achieved by providing air bricks with ventilation openings equivalent to at least 1500mm squared placed horizontally at one-metre centers for each 1.0 metre run of wall.

Air bricks should be ducted through the thickness of the external wall and be placed below floor joists.

If this is not possible, telescopic ducting is available to ensure that the ventilating air has a free path between opposite sides and to all parts of the void (see figure 3).

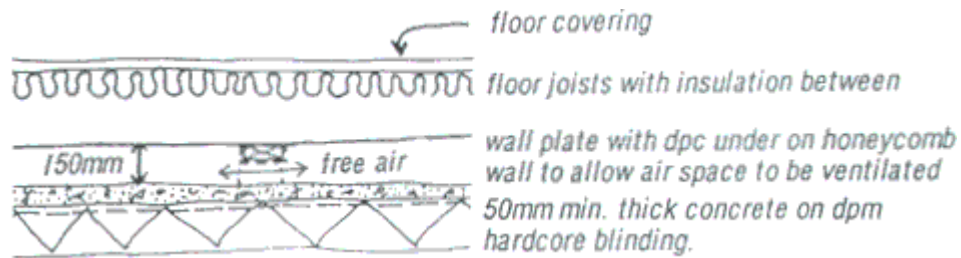


figure 3: typical timber ground floor construction

Floor joists (ground and upper floors)

Span, size and spacing of commonly used timber members of strength class 3 are as follows:

Spacing of joists

Size of timbers	400 Maximum	450 Clear	600 Span
50 x 97	1.98	1.87	1.54
50 x 122	2.60	2.50	2.19
50 x 147	3.13	3.01	2.69
50 x 170	3.61	3.47	3.08
50 x 195	4.13	3.97	3.50
50 x 220	4.64	4.47	3.91
75 x 122	2.97	2.86	2.60
75 x 147	3.56	2.43	3.13
75 x 170	4.11	3.96	3.61
75 x 195	4.68	4.52	4.13
75 x 220	5.11	4.97	4.64

Timber suspended upper floors

Two common methods of supporting joists at first floor level are:

Support of upper floors

- the use of a joist hanger, which is built into the internal leaf of the cavity wall. (figure 4) or
- building the joist into the internal leaf of the brickwork (see Leaflet 7: Walls for more information).

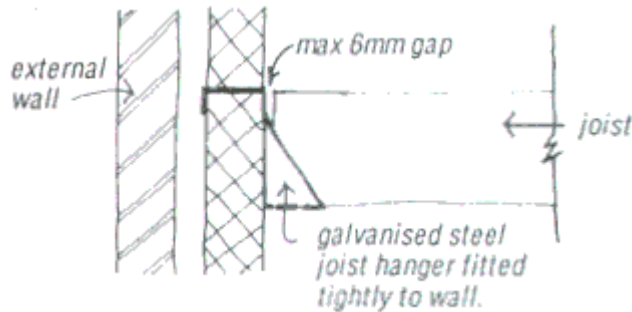


figure 4: methods of supporting upper floors

Restraint of upper floors

The upper floors of a domestic building must provide lateral restraint to the walls. Galvanised mild steel straps (of cross section 30mm x 5mm) should be fixed at maximum 2-metre centres so that they are attached to the wall and fixed across three joists (minimum) (figure 5).

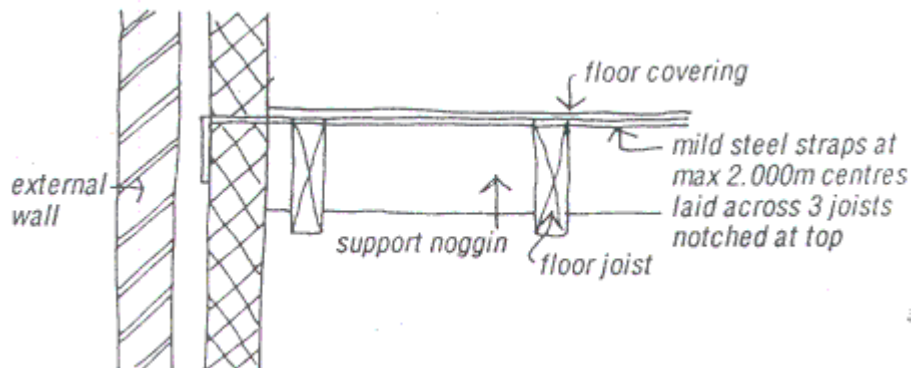


figure 5: methods of supporting upper floors

Strutting

Some form of strutting may be required if the floor joists span a length where it is likely that they will buckle or move laterally. A common form of this is the "herringbone strutting", shown in figure 6.

Galvanised steel herringbone strutting fixed on the centre line of a span is also available.

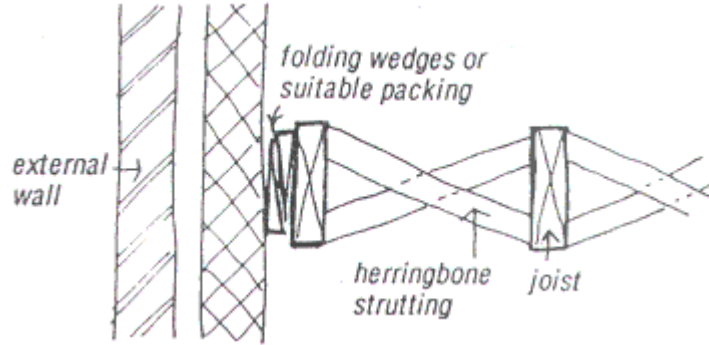


figure 6: typical herringbone strutting

Floor coverings

1) Floor boarding should be of flooring grade type II wood chipboard (to meet BS 5669). Board thickness should not be less than the following for the joists spacings indicated:

Thickness	Maximum Joist Spacing
18mm/19mm	450mm
22mm	600mm

Within bathrooms and kitchens, chipboard should be laid across the joists with each short end falling on a joist. Support under the long edges of the board is not essential.

Sound insulation to upper floors

Sound insulation will be required between flats. A typical example is given in figure 7.

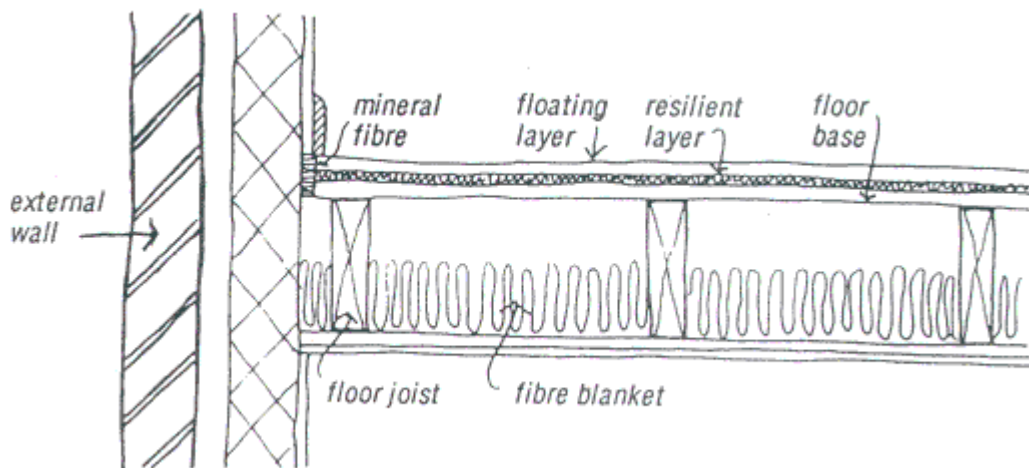


figure 7: inter floor sound insulation

Trimming around a stairway

A stairway will usually require an opening to be formed through the floor. This is created by trimming the floor joists and supporting them by a trimming joist. A typical for of trimming is shown below (in figure 8). General sizes of trimmers and trimming joists may be found in the TRADA approval document.

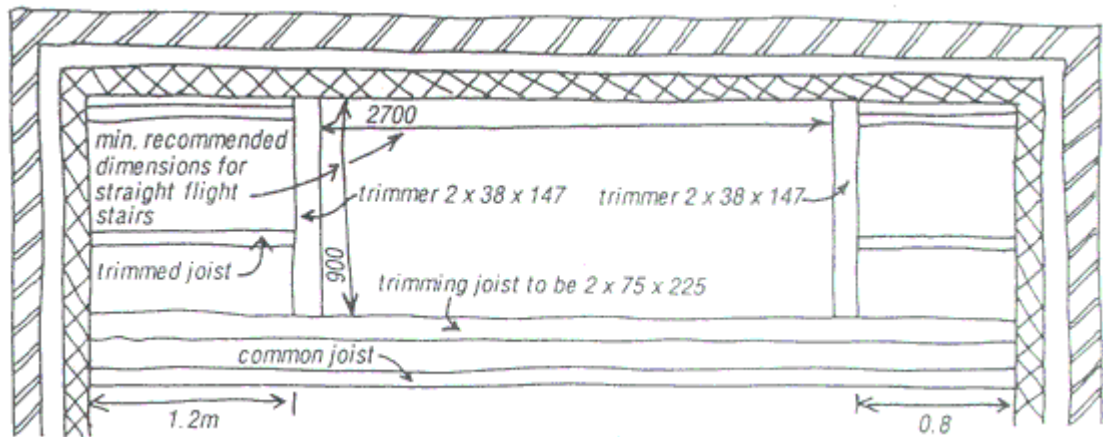


figure 8: Stairwell construction

Heat Loss

A ground floor construction should provide a minimum "U" value of up to 0.35 W/M Squared K resistance to the passage of heat. A semi-exposed floor e.g. a floor separating a house from a garage need only have a "U" value of 0.6 W/M Squared K.

Where insulation is provided in the floor construction, it should be turned up at the floor perimeter to prevent cold bridging.

Reference

Building Regulations 1991 - Approved Document A - Structure, Loading and Ground Movement.
British Standards - 5268/5559.
British Board Agreement Certificates.
Trada Approved Document.