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TECHNICAL MEMORANDUM 001

(consists of 4 pages)

SITE INSPECTION EXPECTATIONS
BASIC STEEL WORKS SUPPORTS OVER OPENINGS

When we receive requests to inspect building work in progress, where they specifically relate to the provision of new steel beams, lintols, or any other structural members placed over an opening, we have the following basic expectations :

1. The beams fitted including all parts and bearing whether using concrete padstones or steel bearer plates must be fitted in accordance with your structural engineers designs. Where any change is observed or has been carried out without notification or permission from your designers, we will expect to receive updated structural calculations and plans.

2. The beam end bearings must be exposed, clearly visible, and the designed end bearings carried out as per your engineers designs.

3. If you have placed new steel beams or lintols which have been covered over by cement renders, encasements or otherwise covered , you will be required to open up those works for inspection purposes.

RESPONSIBILITY FOR COMPLIANCE (Regulation 7: Building Regulations) – It remains at all times that responsibility for carrying out building work that is compliant, and carried out in accordance with compliant professionally prepared plans is an obligation placed upon the building contractor, project managers, any owner appointed professional agent (Architects, Surveyors etc), and ultimately the building owner.

The following images are example of good practice for our purposes.

001 A GOOD EXAMPLE OF A STEEL BEAM BEARING POCKET MADE READY FOR INSPECTION : Steel beam (painted red) with end bearing 100mm into a party wall, on a mild steel plate (unpainted). The brickwork has been cut using a diamond tipped rotary disc to produce a clean cut with minimal disruption to the brickwork.

002 A GOOD EXAMPLE OF STEEL BEAM CONNECTION : Steel beam bolts clearly visible

003 A GOOD EXAMPLE OF STEEL BEAM CONNECTION : Steel beam connection splice bolts clearly visible

004 A GOOD EXAMPLE OF STEEL BEAM RESTING ON A CONCRETE PADSTONE : Steel beam resting on a cast in situ concrete padstone which rests onto dense concrete blockwork walls.

005 A GOOD EXAMPLE OF CONCRETE LINTOL FITTED OVER A WINDOW OPENING: The lintol bearings in this image are clearly visible .

This document only provides a very general overview of your responsibility to carry out compliant work, you should seek advice from your professional designers.

TECHNICAL MEMORANDUM 002

WAY OF ESTABLISHING THE FITNESS OF MATERIALS

The paragraphs listed on this sheet refers the relevant paragraph contained within Regulation 7 – Approved Document (2013 version which is now superceded – *an updated document has been issued in Dec 2018***) which is acknowledged as Crown copyright and the title and edition of the publication is so specified.**

If you are using materials imported into England & Wales from abroad and from a country which may not be part of a harmonised standard then you may be requested to prove the materials fitness for purpose by a Building Control Body in the UK.

1.2 You can assess the suitability of a material for use for a specific purpose in a number of ways, as described in paragraphs 1.3 to 1.21.

CE marking under the Construction Products Regulation

In general –

Countries that require or use CE marking

The countries that require CE marking are the 31 countries in the European Economic Area. This includes:

- All of the 28 EU member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK.
- Three members of the European Free Trade Association: Iceland, Liechtenstein and Norway.

In addition, Turkey has fully implemented many of the CE marking directives, even though it's not a member of the EU or the EEA.

Switzerland is also not an EU or EEA member. However, it is part of the European Free Trade Association, so accepts CE marking as a presumption of conformity with its own national technical regulations for some products.

Products covered by the CE marking requirement

CE marking is not required for all products. However it does apply to a large number of goods, as well as many construction products. It is the manufacturer's responsibility to ensure that products are designed and made in accordance with relevant legislation applied within England & Wales. They must also draw up the required technical documentation and ensure that appropriate assessment procedures are carried out.

The Construction Products Regulation came into effect on 1 July 2013 and stated that manufacturers of construction products would need to apply CE marking to any of their goods that were covered by a hEN or ETA before being able to place them on the market. Just some of the items that need CE marking include:

- Ceilings
- Cladding
- Doors
- Facades
- Finishes
- Floors
- Roofs
- Thermal insulation
- Vents
- Walls
- Windows

. **1.3** Many materials are construction products that have CE marking under the Construction Products Regulation (305/2011/EU-CPR). The Construction Products Regulation requires that construction products on the EU market covered by a harmonised European product standard should normally have CE marking. In addition, manufacturers of products not covered by a harmonised standard can choose to affix CE marking to their products by obtaining a European Technical Assessment. **NOTE:** You can find a list of the harmonised product standards under the Construction Products Regulation on the NANDO information system website at http://ec.europa.eu/enterprise/newapproach/nando/index.cfm?fuseaction=cpd.hs.

. **1.4** CE marking includes the reference of the product standard and the levels or classes of performance being declared against some or all of the characteristics covered by the standard. The CE marking should be on the product, its label, the packaging or accompanying documents. The CE symbol by itself does not necessarily indicate that the material is suitable for the building work.

. **1.5** In addition to CE marking, the product will have a declaration of performance containing more detailed information on the product. This may be a paper or electronic document, or it may be on a website. It is essential to check that the declared performance is suitable for the building works.

. **1.6** In the absence of indications to the contrary, the building control body should assume that the information given in the CE marking and declaration of performance is accurate and reliable, and that the product meets the declared performance.

. **1.7** If the declared performance of a product is suitable for its intended use, the building control body should not prohibit or impede the use of the product.

CE marking under other EU directives and regulations

. **1.8** Products may have CE marking under European legislation such as the Gas Appliances Directive or the Pressure Equipment Directive. Such CE marking shows that the product meets the essential requirements set out in the legislation – for example, minimum safety requirements – and can be placed on the EU market.

1.9 Some products have CE marking in accordance with both the Construction Products Regulation. and other legislation. The CE marking shows that the product complies with the requirements in all relevant EU legislation

British Standards

. **1.10** Nearly all British Standards for construction products are the British versions of harmonised European standards used for CE marking. The BSI numbering policy is to adopt the CEN numbering, prefaced with BS, e.g. **BS EN 197-1:2000**.

. **1.11** Some British Standards are the British version of non-harmonised European standards; these also adopt the CEN numbering, prefaced with BS. These do not contain an Annex ZA, so CE marking cannot be affixed to products made to these standards.

. **1.12** Some British Standards for products not covered by a European standard will continue to exist.

. **1.13** Where a construction product has been made and assessed in accordance with one or more British Standards referred to in 1.11 and 1.12, this may show whether the product is suitable for its intended use.

Other national and international technical specifications

1.14 An international technical specification, including those prepared by ISO, or a national technical specification of a country other than the UK, may be used to demonstrate that a product not covered by a harmonised European standard meets the performance requirements of the Building Regulations.

Where necessary, the person who intends to carry out the work should obtain translations of specifications and demonstrate how the material meets the requirements of regulation 7.

NOTE: The national technical specifications of EU member states (and non-EU countries that are full members of CEN) are being progressively replaced by harmonised European standards, as is the case with British Standards.

Independent certification schemes

. **1.15** There are many independent product certification schemes in the UK and elsewhere that may provide information on the performance of a product. Such schemes certify that a material complies with the requirements of a recognised document and indicates it is suitable for its intended purpose and use. These may be in addition to, but not conflict with, CE marking.

. **NOTE:** Materials which are not certified by an independent scheme might still conform to a relevant standard.

. **1.16** Accreditation of a certification body by a national accreditation body belonging to the European co-operation for Accreditation (EA) provides a means of demonstrating that their certification scheme can be relied upon. In the UK, most independent certification bodies are accredited by the United Kingdom Accreditation Service (UKAS), which belongs to the EA. It is important to check the scope of the accreditation of a certification body, as accreditation might cover only part of the certification body's testing or certification business.

Tests and calculations

1.17 Where there is no relevant harmonized European standard, tests, calculations or othermeans may be used to demonstrate that the material can perform the function for which it is intended. UKAS or an equivalent national accreditation body belonging to the EA may accredit the testing laboratories; this accreditation provides a means of showing that tests can be relied on.

Past experience

1.18 Past experience, such as use in an existing building, may show that the material can perform the function for which it is intended.

Sampling

. **1.19** Under regulation 46 of the Building Regulations, local authorities have the power to take samples as necessary to establish whether materials to be used in building work comply with the provisions of the regulations.

. **1.20** Regulation 46 does not apply to any work specified in an initial notice or to any work for which a final certificate has been given by an approved inspector and accepted by the local authority.

. **1.21** Regulation 8 of the Building (Approved Inspectors etc.)Regulations 2010 provides that an approved inspector, having given an initial notice which continues to be in force, may take samples of material as are reasonable to establish within the limits of professional skill and care that regulation 7 of the Building Regulations or any other applicable regulations are complied with.

Short-lived materials

. **1.22** Some materials, in the absence of special care, may be considered unsuitable because of their rapid deterioration in relation to the expected life of the building.

. **1.23** A short-lived material which is readily accessible for inspection, maintenance and replacement may meet the requirements of the regulations if the consequences of failure are not likely to be serious to the health or safety of people in and around the building.

. **1.24** If a short-lived material is not readily accessible for inspection, maintenance and replacement, and the consequences of failure are likely to be serious for health or safety, it is unlikely that the material will meet the requirements of the regulations.

. **1.25** As noted in paragraph 0.2, local authorities have the power to impose conditions on the use of short-lived materials.

Materials susceptible to changes in their properties

1.26 The properties of some materials can change in certain environmental conditions. These changes can affect the performance of the materials over time.

1.27 Materials that are susceptible to changes in their properties may be used in building work and will meet the requirements of the regulations if the residual properties, including the structural properties, meet both of the following conditions.

a. Residual properties can be estimated at the time of their incorporation in the work.

b. Residual properties are shown to be adequate for the building to perform the function for which it is intended, for the expected life of the building.

END OF THIS DOCUMENT
(FOUR PAGES IN TOTAL)

TECHNICAL MEMORANDUM 003

ACCEPTABLE POSITIONS FOR DAMP PROOF COURSES IN EXTERNAL WALLS

The diagram below shows typical examples of the position of damp proof courses fitted in external walls of buildings which we would find to be acceptable

Diagram 8 Damp proof courses (see paragraph 5.5(b))

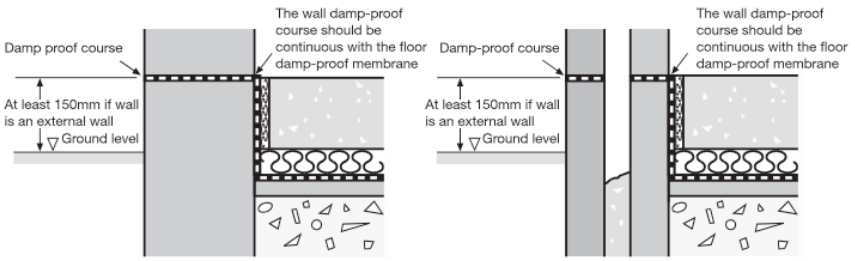
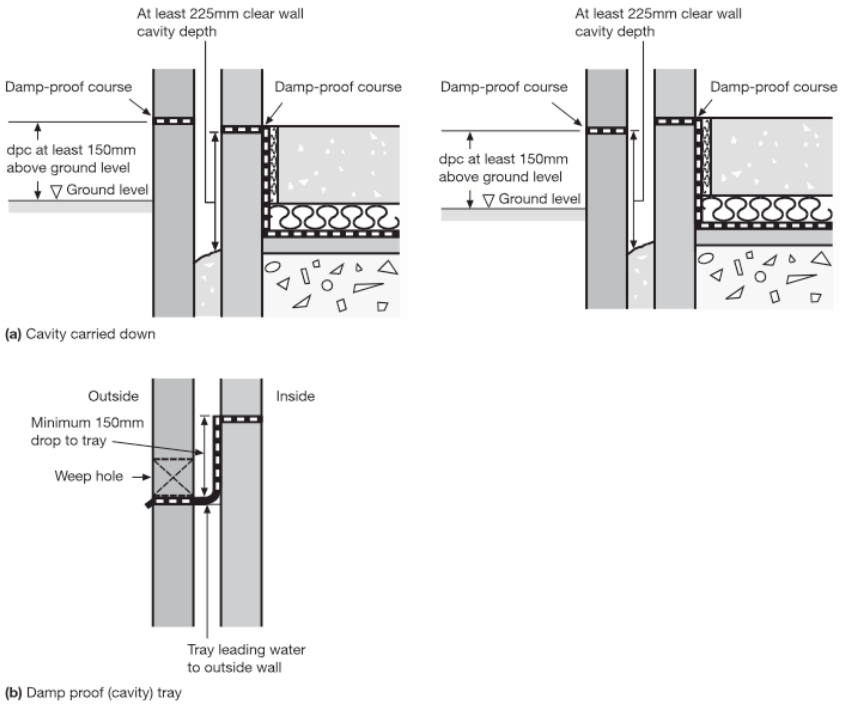


Diagram 9 Protecting inner leaf (see paragraph 5.5(c))



References in this diagram are contained with Approved Document Part C

Building Control Surveyors Ltd (Corporate Approved Inspectors)
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TECHNICAL MEMORANDUM 004
Soakaways

This is for general guidance and does not constitute a design for your particular circumstances. You must consult your designers for assistance.

Why use a soakaway?

Building Regulations require you to adequately dispose of stormwater from the building.

You must ensure water is dispersed into the ground evenly and quickly you must consider the use of a soakaway only when other options of rainwater disposal is not possible i.e. Surface drain, rainwater butt / harvester, river course etc.

You must use a soakaway only when design criteria can be met. **For instance you are unlikely to be able to use a soakaway in soil that is both impermeable and dense eg. Dense clay soils.**

Discharging stormwater into a drain will only be allowed if soakaways or other infiltration methods are not suitable.

Soakaways – how they work?

Soakaways store the immediate stormwater run-off to allow infiltration / percolate into the adjacent soil over a short period of time. They must discharge their stored water sufficiently quickly to provide the necessary capacity to receive run-off from a subsequent storm.

The time taken for discharge depends upon the soakaway, shape and size, and the surrounding soil's infiltration characteristics. Soakaways can be constructed in many different forms and from a range of materials, your designers should be able to assist you in those matters.

When can a soakaway be used? If you are planning to use a soakaway, there are certain things that you need to do, these being:

- Identify if a soakaway is the most suitable means of disposing of stormwater,
- Identify that the soil around the building is satisfactory for infiltration,
- The site is not on filled ground,
- The site does not slope towards the building,
- The water table is not too high.

Ensure soakaways can be sited at least **5 metres from any buildings**. If you are close to boundaries you should discuss this with your neighbour, otherwise it is recommended that they are sited at least **2m from a neighbours boundary.**

If you cannot meet these criteria stormwater can be disposed of via a storm drain. Foul or combined drains cannot be used.

How to construct surface water soakaways?
If it is not known whether the soil has an adequate degree of permeability or the roof area to be drained into the soakaway exceeds 100m2 you will need to:

- Carry out an on-site percolation test
- Decide on the construction type for the soakaway i.e. concrete ring surrounds, or a proprietary manufactured cage containing graded granular fill etc
- Calculate the required storage volume
- Consider space requirements, site layout, topography, water table, subsoil type etc
- A typical depth of a soakaway serving small residential buildings (up to 100 sq.m) is approx. 1.5 x 1.5 m in plan area, and between 1.5 -2.5m deep in a permeable soil i.e. chalk, sand, gravel etc.

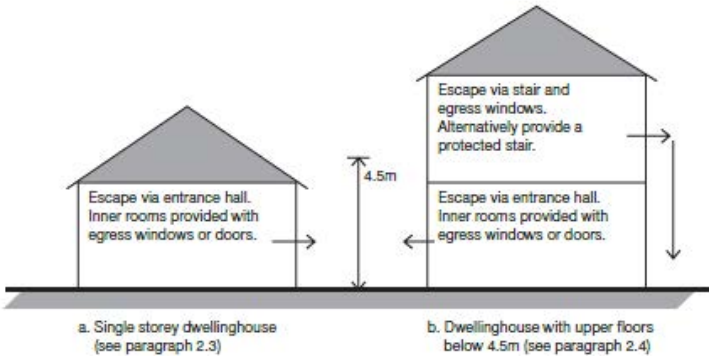
The above should be carried out in accordance with BRE Digest 365.

TECHNICAL MEMORANDUM 005
WINDOWS FOR USE AS A MEANS OF ESCAPE IN CASE OF FIRE FROM DWELLINGS

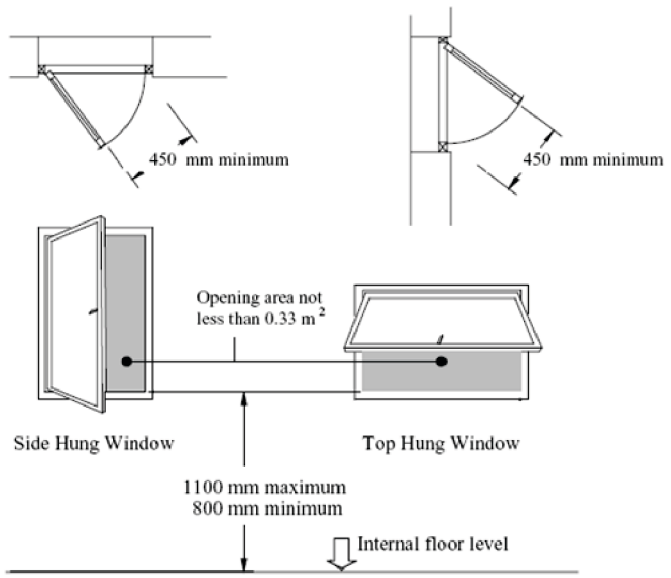
Means of escape requirements – buildings with floors less than 4.5m above external ground level.
All dwellings and extensions shall have suitable for means of escape. In bungalows, rooms which connect to a hall which does not directly exit to an outside door requires windows suitable for means of escape.

Achieving the requirement for means of escape
The window should have an unobstructed openable area that is at least **0.33m² and at least 450mm high and 450mm wide** (the route through the window may be at an angle rather than straight through). The bottom of the openable area should be **not more than 1100mm above the internal floor**.

Diagram 1 **Means of escape from dwellinghouses**



Below diagrams show typical window details to meet the requirement for means of escape



(Paragraph references on these diagrams refer to the Approved Document Part B)

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TECHNICAL MEMORANDUM 006
SMOKE DETECTORS IN DWELLINGS

FIRE DETECTION AND FIRE ALARM SYSTEMS.

In most cases the installation of smoke detectors in dwellings can significantly increase the occupants safety by giving early warning of a fire outbreak. Building Regulations require the installation of automatic smoke detectors to new dwellings, dwellings created or subjected to 'Material Alterations' and loft conversions.

REQUIREMENTS.

• All dwellings to be fitted with a fire detection and fire alarm system in accordance with BS5839 - 6: 2013 – Grade D - category LD3 standard. • System to be mains operated and must conform with BS EN 14604: 2005, Smoke alarm devices or BS5446-2: 2003, Fire detection and fire alarm devices for **dwellinghouses**, Part 2 Specification for heat alarms, respectively. AND Must be battery backed up (either rechargeable or non-rechargeable). Wireless interconnected smoke and heat detection are permissible as long as they comply with building regulation requirements, but must be mains powered with an internal battery back-up.

• Where there is more than one smoke detector required (see positioning requirements below), they should be interlinked together, so that all sound the warning should one of the detectors operate.

TYPES OF DETECTORS.

1. Ionization chamber detectors
2. Optical detectors – less affected by low levels of invisible particles, such as kitchen fumes and are not as prone to false alarming where adjacent to such areas. Installation and power supplies.

• Smoke detectors are to be mains powered to a single independent circuit on the dwellings mains consumer unit or a single regularly used local lighting circuit.

• Provide a means of isolating power to the smoke alarms without isolating the lighting.

• Electrical installations should comply with Approved Document P (Electrical Safety).

• There is no need for special fireproof wiring – traditional power cabling can be used for powering and interlinking the alarm units (except to large houses where BS5839-6: 2013 specifies fire resisting cabling should be used for Grade A and B systems).

• Any conductors used for interconnecting alarms (signalling) should be readily distinguishable from the supplying mains power, e.g. colour coding.

• Mains powered detectors may be interconnected using radio links provided they do not reduce the lifetime or standby power duration below 72 hours. In this case, the smoke alarms may be connected to separate power circuits.

Positioning of smoke and heat detectors / alarms. Detailed guidance is given in BS5839-6: 2013, but typical positions are as follows:

• Position in circulation areas on every floor of the dwelling - positioned between the sleeping spaces and places where a fire is likely to start e.g. living room / kitchen and yet be close enough to the bedroom doors to effectively wake sleeping occupants.

• Smoke detectors should be positioned so that there is one within 7.5m of every habitable room door and a minimum of 1 smoke detector in every storey of the dwelling.

• If your kitchen is not separated from the stairways or circulation routes by a suitable door, then you must also install a compatible **heat detector** in the kitchen, interlinked with the other smoke detectors positioned as above in the circulation routes.

• All heat and smoke detectors are to be interlinked so that all operate an alarm if one is triggered.

• Smoke detectors should preferably be fitted to the ceiling in a central position and at least 300mm from any wall or light fitting. Check the manufacturers instructions carefully when deciding where to position them – particularly if you are going to mount them on the wall. Wall mounted detectors should generally be fixed between 150mm and 300mm below the ceiling. A basic diagram has been provided at the end of this document. You must although fit the smoke / heat detectors to suit your particular layout.

• Smoke detectors should not be fixed directly above heaters, air conditioning units, ducted heat outlets, or in bathrooms, showers, cooking areas or garages, where steam, condensation or fumes could cause false alarms to occur.

• Do not fit very hot or very cold areas e.g. boiler rooms or unheated porches, where air currents may move smoke away from the detector before it activates.

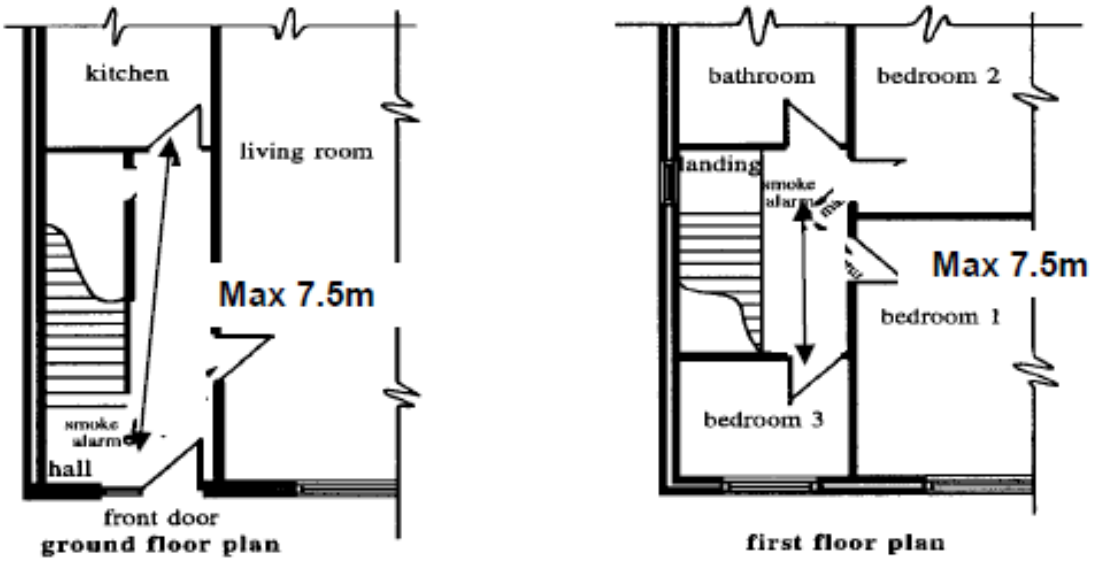
• Always position your detectors so that they can easily be maintained, cleaned and tested – so don't position them over stairs etc. Maintenance. Always maintain, clean and test your smoke detectors regularly as directed by the manufacturers instructions.

LARGE HOUSES (i.e. more than 1 storey and any storey exceeds 200m2)

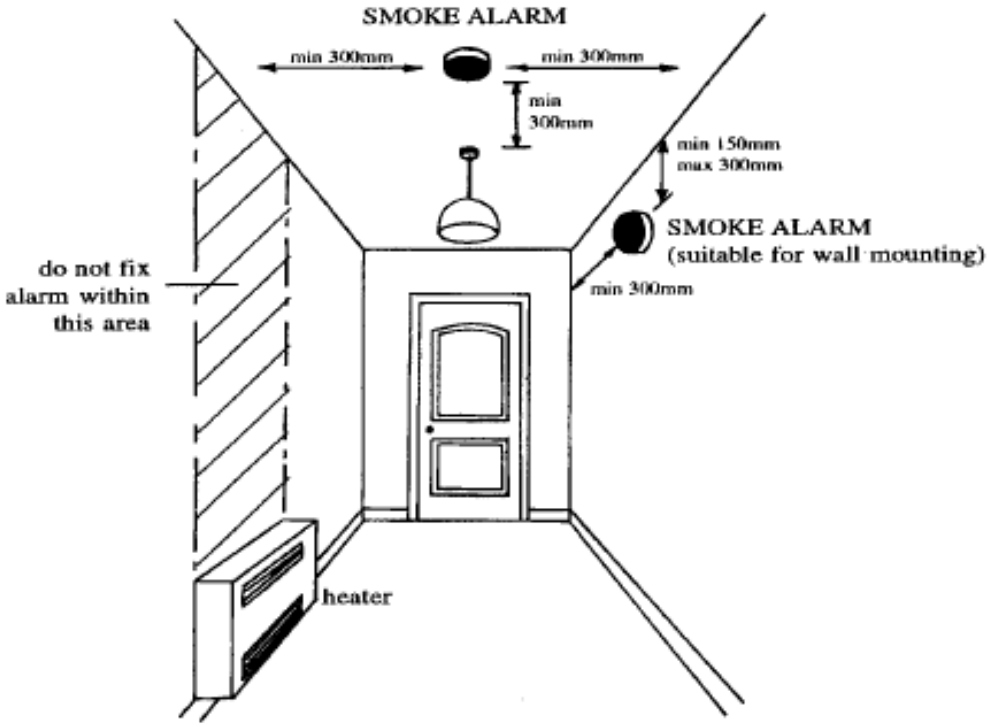
a) Large dwellings of 2 storeys (excluding basements) to have fire detection / alarm system of Grade B - Category LD3 (BS 5839-6: 2013)

b) Large dwellings of 3 or more storeys (excluding basements) to have fire detection / alarm system of Grade A - Category LD2 (BS 5839-6: 2013)

MATERIAL ALTERATIONS. Where a material alteration provides rooms above ground floor level or where they are provided to ground floor level and there is no final exit from the new room, a fire detection / fire alarm system should be installed. Smoke detectors are required to be provided in circulation spaces as for new dwelling houses.



Position of Smoke Alarms within a Typical House



Position of Smoke Alarms within the Circulation Area

TECHNICAL MEMORANDUM 007
MOVEMENT JOINTS IN MASONRY WALLS

In cavity masonry walls where should vertical movement joints be located with respect to end walls, corners and window/door openings?

Movement in masonry cavity walls can be caused by a combination of actions including expansion, contraction and the volume changes resulting from the effects of moisture within the masonry units.

Movement can be reversible such as that caused by temperature variations, or one way as caused by the expansion that occurs as clay bricks age or by shrinkage that occurs as concrete blocks/bricks age.

Colour, texture and the orientation of a wall to the sun can also affect the heat absorbed by the masonry and the resulting degree of movement.

The size and shape of the masonry panels, whether they are square or long rectangles, as well as the distribution of openings and restraints will also influence the build-up of stresses and subsequent movement.

Movement joints should be provided to control expansion and contraction and avoid unsightly cracking. The joints should be properly constructed to cater for the calculated degree of movement without reducing the stability and weathertightness of the wall.

Calculating the theoretical movement of a wall is complex which is why general guidance for spacing of movement joints is usually adopted. Table 1 quotes joint widths and spacing for movement joints in the outer leaf to minimise the risk of major cracking in different types of masonry. The distances quoted, between vertical movement joints, are based on straight sections of wall.

Horizontal expansion of the continuous panels of a masonry box will try to push the corners outwards (see Diagram 1). Where the length of wall exceeds the stated joint spacings, this effect can be reduced by sub-dividing the wall into shorter lengths of less than the normal spacing (see diagram 2), or by locating the first movement joint approximately half the stated joint spacing from the corner (see Diagram 3).

In theory, an expansion joint could be located at the corner, but this would affect the buttressing offered by the return wall unless the masonry was suitably tied in accordance with an engineer's design. In order for a return wall to provide sufficient buttressing to the flank wall, without providing additional ties, the expansion joint should be located at least 550mm from the internal corner (see Diagram 3).

Some guidance suggests that the distance between movement joints, measured around a corner, should be the same as the distance between movement joints in a straight wall. This approach could lead to a requirement for movement joints in end walls particularly with concrete block/brick masonry. In practice, providing that the length of an end wall between returns is not greater than the normal spacing of movement joints for the masonry material, it should perform satisfactorily even when the first movement joint on the return wall is up to half the maximum distance for the masonry material.

Straight clay brickwork walls containing short staggers with offsets less than 675mm, (see Diagram 4), should be treated as if they were a straight wall when determining movement joint spacings.

Therefore if the sum of the lengths of wall on either side of the stagger exceeds the maximum length without a movement joint then a movement joint should be introduced into one of the two lengths or at the stagger as shown in Diagram 4. Staggers and movement joints in masonry walls, other than clay brickwork, should be engineer designed.

Movement joints should not coincide with door or window openings due to the difficulty in continuing the movement joint between the frames and masonry and around the ends of the lintels (see Diagram 6).

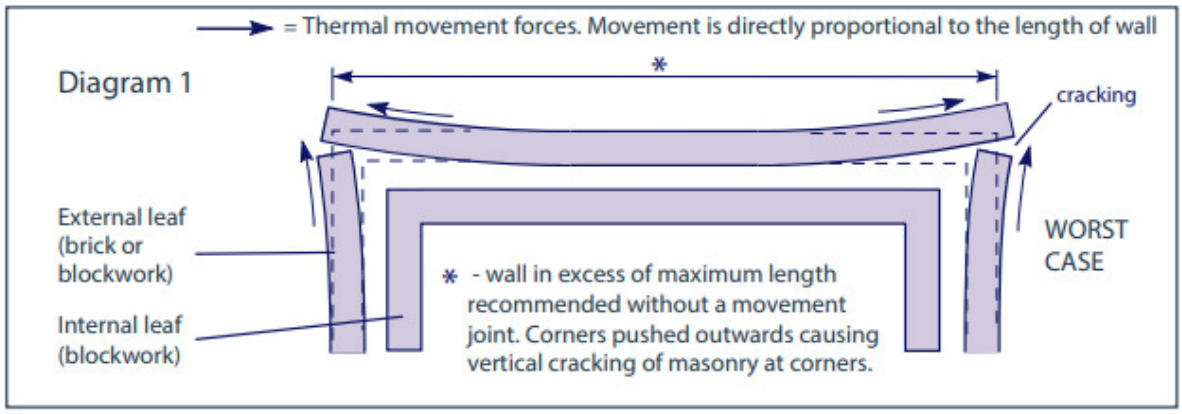
Vertical movement joints should therefore be located in sections of full height masonry between the openings (see Diagram 5).

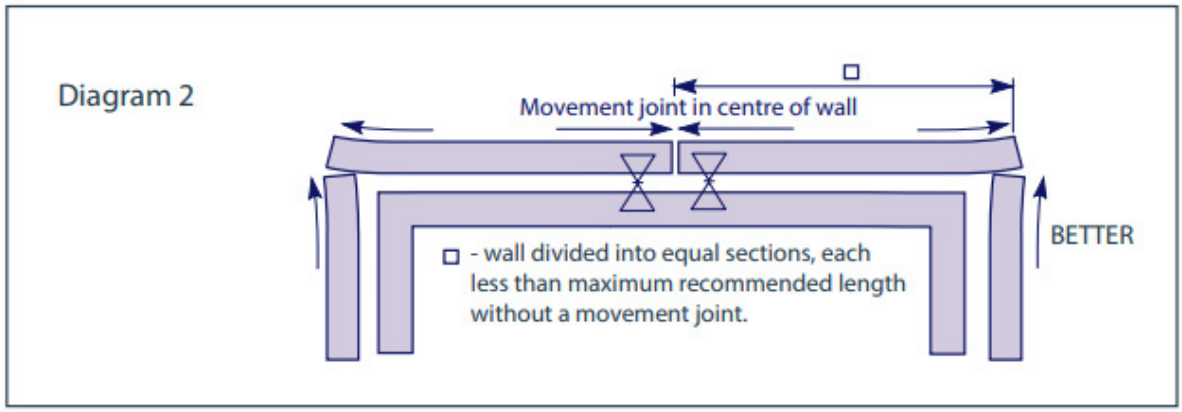
Where a full height masonry panel does not exist (see Diagram 7) the location and detailing of the movement joint should be designed by an engineer to avoid it passing around window and door frames.
Window and door openings in effect divide the wall into a series of masonry panels.

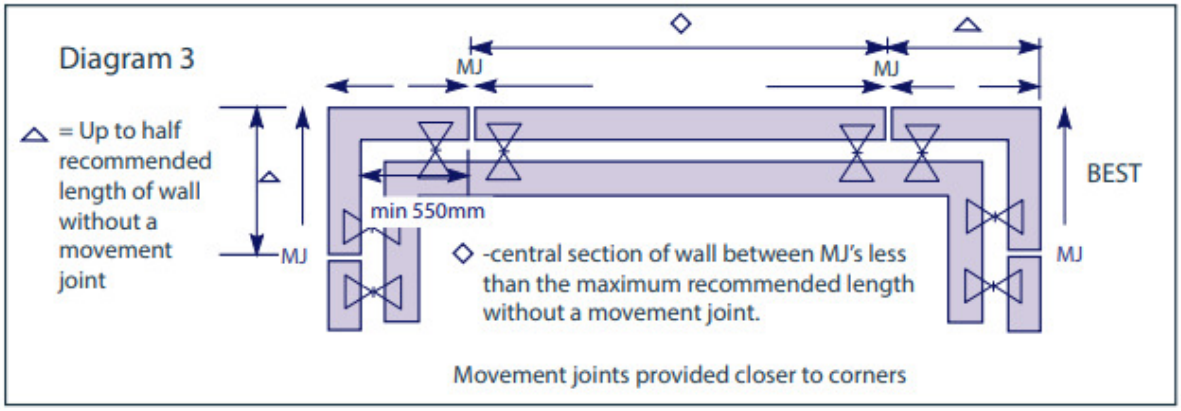
This can lead to uncontrolled cracking in narrow horizontal panels between openings on different floor levels. Where the length to height ratio of each panel is high e.g. more than 3:1, the distance between movement joints may need to be reduced. Alternatively, bed joint reinforcement may be used to control the stresses. Any reinforcement should be used in accordance with the manufacturer's recommendations.

As a general rule movement joints in the outer leaf of external walls should be provided at not more than the following centres:

Construction	**Provide movement joints at not more than the following centres**
Clay brickwork	**12m** (15m max)
Lightweight concrete block/brick (autoclaved or using lightweight aggregates gross density not exceeding 1,500kg/m3) -	**6m**
Dense concrete block and brick (using dense aggregate gross density exceeding 1,500kg/m3)	**7.5-9m**
Calcium silicate brick 7.5-9m	**7.5-9m**
Any masonry in a parapet wall (length to height ratio > 3:1)	half the above spacings and 1.5m from corners.
Movement joint widths for clay bricks should be not less than	**1.3mm/m** i.e. 12m = 16mm and for other masonry not less than 10mm
Table 1	







- Wall ties within 225mm of movement joint @ maximum 300mm centres vertically.

General Note: Movement joints in internal walls are not normally necessary for single dwellings unless the walls are straight and unbroken and over 6m long, in which case the block manufacturer's recommendations should be adopted. This may include the use of bed joint reinforcement in the courses above and below window openings.

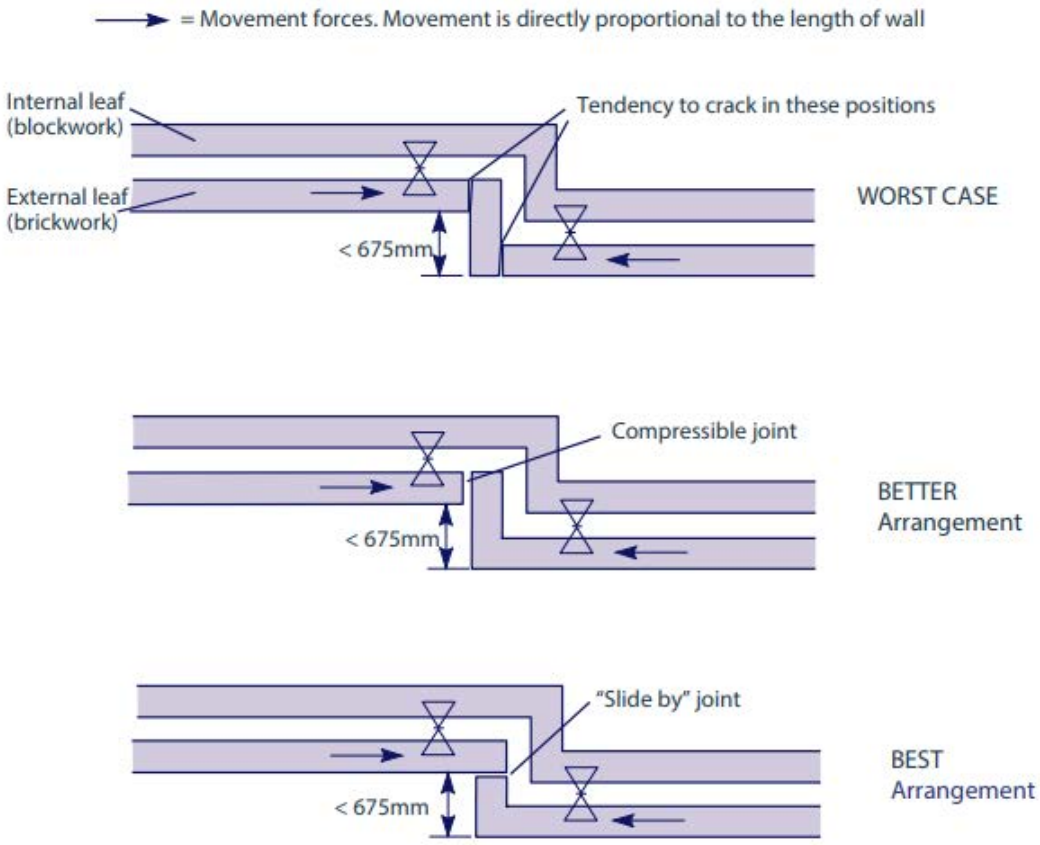


Diagram 4 - Short staggers in external cavity walls made from clay brickwork.

TECHNICAL MEMORANDUM 008

DOORS & LOFT CONVERSIONS IN DWELLINGS

Introduction.

The approved document to regulation B1 2006 amended to 2013 version, is now in two volumes.
Volume 1 – Dwellinghouses deals with means of warning and escape to this category of building only. Our guidance sheets are regularly updated, so if you are in any doubt then please check with our office for the latest advice.

It is no longer necessary to provide self closing devices to doors within a dwelling house other than to an integral garage.

<u>Loft Conversions :</u>

Where an existing roof space is converted into habitable rooms the previous varying provisions relating to this work have been removed, making it necessary to satisfy the recommendations in full.
The provision of an egress window at second floor level in lieu of a fully protected route of escape has been removed.

The new floor is still required to achieve 30 minutes fire resistance, as are those areas that separate any rooms from the stairwell enclosure.

This guidance is intended to provide an alternative approach that aims to achieve the functional requirements of regulation B1 for loft conversions. It is intended to be applied to two storey houses that are converted to form 3 storeys. The floor area should not exceed 50m^2 to the new 3rd storey level. **It is not intended for Houses in Multiple Occupation that are covered under the Housing Act 2004 (as amended).**

Key points to consider

- The approved document to regulation B1 requires FD20 doors to all habitable rooms in a new or altered dwellinghouse with one floor more than 4.5m above ground level, where they form part of the enclosure to the stair.
- Interlinked smoke detection is required to the circulation spaces at each level.

- **RETAINING ANY EXISTING DOORS :** If you wish to retain existing doors within a dwelling house, when undertaking alterations to form habitable rooms in the roof, the following may be considered as suitable alternatives to replacing some or all doors.

1. In addition to smoke detectors at every storey level, detectors should also be provided at half landing levels adjacent to habitable rooms, furthermore –

a) A heat detector should be provided in the kitchen and smoke detectors in all habitable rooms entered from the stair enclosure.

b) All alarms should be mains powered with standby backup, interlinked so that detection of heat or smoke in one unit operates the alarm in all others. BS 5839:6 recommends optical smoke detectors in circulation areas with ionization detectors better for living and dining rooms. Optical may be better in bedrooms although either type would be considered acceptable. Refer to our guidance note Memorandum 006 for further advice.

c. There should be at least one window at first floor level of a size that would permit emergency egress to either a rear garden of sufficient depth or to the front elevation.

2. **Panel doors in excess of 32mm thickness**

a. The door should be attached to the door frame with steel hinges, not be visibly warped, fit well into its frame and there should be no visible defects particularly in the panels.
b. Any existing glazing to doors or fanlights should be replaced with wired glass or similar fire resistant glazing to provide adequate resistance for integrity and stability.
c. There should be no significant defects to adjacent walls or around door frames forming the stair enclosure.

3. **Existing Panel doors less than 32mm in thickness**

a) In addition to the recommendations for panel doors in excess of 32mm indicated above, if it is intended to retain doors less than 32mm in thickness a proprietary solution should be sought to upgrade the door.

b) This may include the application of fire resistant materials to the panels and stiles on the room side of the door. Such doors can be provided with a certificate from a specialist supplier confirming their upgraded suitability.

c) Alternatively, the door can be upgraded, on the room side, by infilling the panel with a fire resistant board and applying a similar board glued and screwed over the entire door.

4. Hardboards Flush doors.

Existing hardboard or other lightweight flush doors are not considered adequate to provide a reasonable level of fire protection to a stair enclosure and should be replaced with FD 20 doors in accordance with the recommendations of the approved document.

TECHNICAL MEMORANDUM 009

CONCRETE ENCASED STEEL BEAMS USED AS GROUND BEAMS AS PART OF FOUNDATIONS OR BRIDGING BEAMS OVER A DRAIN RUN

(DWELLING HOUSES LESS THAN 2 STOREYS)

Introduction.

This memorandum note highlights key expected features when a builder needs to use steel "I" shaped beams within foundations. This note relates only to domestic buildings not exceeding two storeys in height.

This guidance does not seek to over-ride your structural engineers design, and provides only guidance. You must confer with your own structural engineers if you have a query relating to your structural deign proposals. Our basic expectations for this type of encased steel arrangements are as follows -

1. Only beams with equal flanges may be designed as cased beams when the following conditions are fulfilled:

   a) The steel section is of a single web and "I"form or of double channel form with the webs not less than 40mm apart.
   b) The beam being placed in the ground is un-painted and is solidly encased in ordinary dense concrete, with 10mm aggregate (unless solidity can be obtained with larger aggregate), and a cube strength of not less than 21N/mm2 at 28 days when tested in accordance with BS 1881-124:2015 Testing concrete, "Methods for analysis of hardened concrete".
   c) The minimum width of solid casing is equal to b+100mm.
   d) The surfaces and edges of the flanges of the beam must have a concrete cover of not less than 50mm.
   e) The concrete casing surrounding the beam is effectively reinforced with wire complying with BS 4482:2005 Steel wire for the reinforcement of concrete products. The wire shall be at least 5mm diameter and the reinforcement shall be in the form of stirrups at not more than 200mm pitch centres, and so arranged as to pass through the centre of the covering to the edges and soffit of the lower flanges or binding (i.e. **D49** wrapping mesh)

Please refer to image 1 and image 2 on the following page :

Image 1 - Typical example : Un-painted steel beams positioned in the ground, wrapped in structural D49 mesh

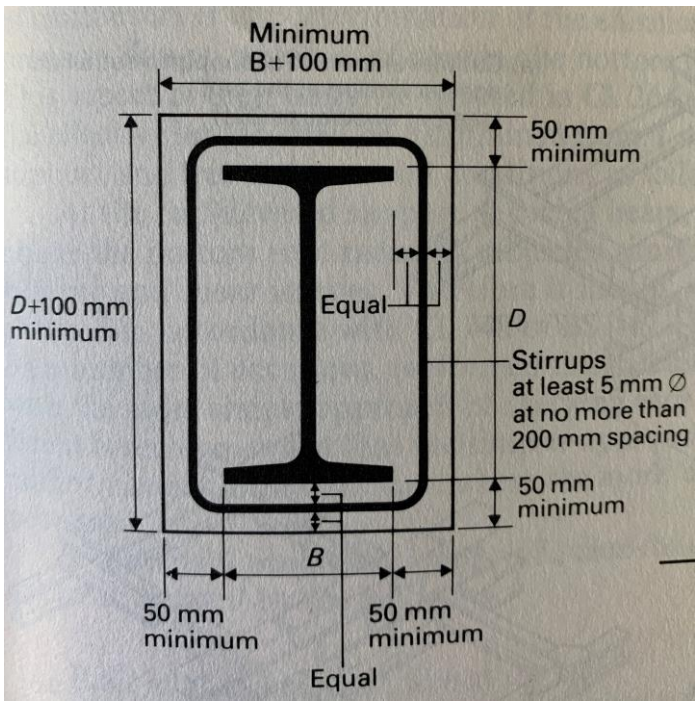


Image 2: Un-painted steel beam with 5mm dia. steel stirrups and concrete encasement

TECHNICAL MEMORANDUM 010

GENERAL FIRE SAFETY REQUIREMENTS WHERE LOFT CONVERSIONS ARE CARRIED OUT ON BUILDINGS TO FORM A NEW SECOND FLOOR

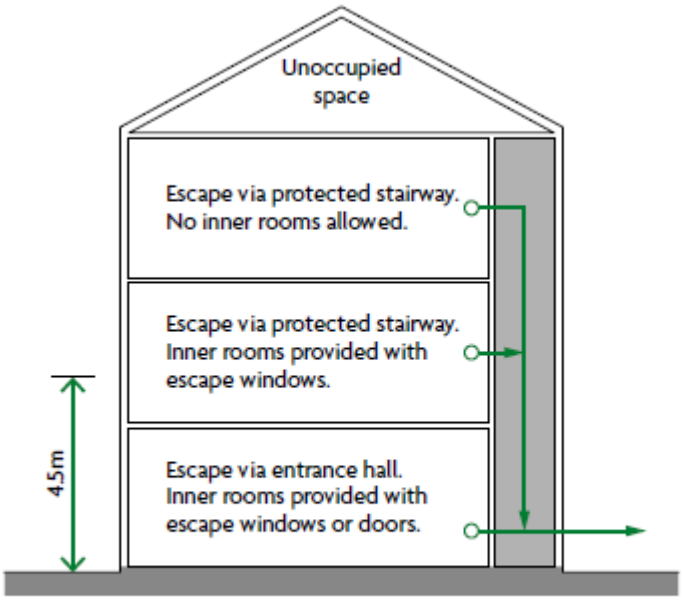
(DWELLING HOUSES consisting of ground, 1st, 2nd floors after conversion and a maximum of two habitable rooms and a floor area not more than 50m2 and where only the loft floor is more than 4.5m above ground level.)

Introduction.

The design of modified buildings should result in a layout that safeguards **LIFE SAFETY** for current building occupiers as well as subsequent owner / occupiers of dwelling houses.

The guidance is based on a number of factors all designed to address safe means of escape in case of fire. Some aspects are relevant, whichever solution is adopted, whereas others are dependent on the chosen option.

As always we do recommend that you directly consult the Approved Documents as published by HM Government and with your own design consultants – **Key points are listed at the end of this document.**



General means of escape in case of fire routes for a building with a new second floor

Floors

The new loft floor is, in all solutions, required to achieve 30 minutes fire resistance together with those walls that separate rooms from circulation areas which include the stairwell enclosure. In some situations the existing first floor may be permitted to have a reduced standard of fire resistance - known as a modified 30-minute fire resistance. This reduced

standard only applies where it separates rooms, floors within circulation areas will still need a full 30 minutes fire resistance as detailed in Building Regulations Approved Document B Volume 1 paragraph 4.7.

Doors

Some homeowners often wish to retain existing doors rather than replace them. In general, doors from rooms and cupboards opening on to the stairwell enclosure must be FD20 standard, but they do not need to be self-closing, any glazing in the doors must have 30 minutes fire resistance. Where a bathroom can only be entered directly from the staircase enclosure any walls, floor or ceiling that separate it from rooms must be constructed to achieve a 30-minute fire-resisting standard.

In some instances, it may not always be necessary to provide fire doors to cupboards entered from the stairwell enclosure if they are small and the fire risk is considered to be low.

However, where a door separates a circulation area from an attached or integral garage it must be to FD30 standard fitted with a self-closing device and incorporate a cold smoke seal with intumescemt strip.

Construction details for different door types

(a) New door openings - All new doors must be a minimum FD20 fire-rated and fixed in suitable fire resistant frames.

(b) Existing doors of historical or architectural merit - In some instances, it may be possible to upgrade these doors to an acceptable fire-resistant standard using intumescent materials, applied as a veneer , thin board material or even as a specialist paint application . This will be dependent on how well the door fits in the frame, its general condition, including; quality of joints and whether they are adequately glued together; and the hinges having a melting point of at least 800c.

Where the door's fire resistance performance cannot be adequately proven, then we will require that mains powered, incorporating battery back-up interlinked, smoke or heat detection is provided within every habitable room including kitchens.

(c) Existing panel doors in excess of 32mm thickness - The door should be attached to the door frame with steel hinges, not be visibly warped, fit well into its frame (4mm gap at head and sides maximum) and there should be no visible defects in the panels, no significant defects to adjacent walls or around door frames forming the stair enclosure.

Where the door's fire resistance performance cannot be adequately proven, then we will require that mains powered, incorporating battery back-up interlinked, smoke or heat detection is provided within every habitable room including kitchens.

(d) Existing panel doors less than 32mm in thickness The door needs to meet the requirements for panel doors in excess of 32mm and be upgraded. This may be by the application of a suitable fire-resistant proprietary treatment to the panels and stiles on the room side of the door, which must be certified by a specialist supplier confirming its fire-resistance. Alternatively, the door can be upgraded on the room side by infilling the panels with a fire-resistant board (i.e. Supalux) and then applying a similar board that is glued and screwed over the whole of the same side of the door.

Where the door's fire resistance performance cannot be adequately proven, then we will require that mains powered, incorporating battery back-up interlinked, smoke or heat detection is provided within every habitable room including kitchens.

(e) Existing hardboard flush doors Existing hardboard or other lightweight flush doors are not considered adequate to provide a reasonable level of fire protection to a stair enclosure and should be replaced with FD20 doors as mentioned in (a) above.

(f) Glazed doors Existing glazed doors which do not provide the required fire protection to a stair enclosure should be replaced with FD20 doors in accordance with type (a) above or the glazing should be replaced with suitable fire-resisting glass with appropriate beading.

Fire alarm and detection systems

All smoke and heat alarm and detection systems must comply with Building Regulations Approved Document B Volume 1 - Section 1, which cover positioning, power supplies and design of installations. It is envisaged any system with mains-wired, interlinked alarms will conform to BS 5446 - 1 or BS 5446-2 and be located at all three storey levels of the building within the circulation areas. All alarms should benefit from a standby power supply as detailed in clause15 of BS 5839-6 with optical smoke detectors in circulation areas and ionisation detectors in living and dining rooms. Optical sensors are generally considered to be more appropriate in bedrooms although ionisation heads are also acceptable.

Design solutions

This guidance considers four possible solutions that can meet the requirements of Building Regulations Approved Document B Volume 1 Part B1 'Means of warning and escape'.

For the purposes of this guide a **protected stairway** is a stair that discharges through a final exit to a place of safety that is adequately enclosed with fire resistant construction.

For a full definition please refer to Building Regulations Approved Document B Volume 1 Appendix A. The following are the four possible solutions.

- Protected single stair escape
- Partially protected single staircase and open plan ground floor (typically utilizing residential water mist or sprinklers, or fire curtains)
- Alternative escape
- Fire-engineered approach (typically utilizing residential water mist or sprinklers, or fire curtains)

Protected single stair

A protected stairway should be provided throughout the height of the building to a final exit. This can be varied by giving access to two separate escape routes at ground level, both of which lead to final exits that are separated from each other. The stair enclosure must be to a 30-minute fire-resistant standard with doors as detailed above. Interlinked smoke detection should be provided in circulation spaces at all levels. Where it cannot be proved that existing doors of historical or architectural merit achieve the FD20 standard of fire resistance, then smoke detectors will be needed at every storey level (including half landing levels adjacent to habitable rooms) and in all habitable rooms entered from the stair enclosure with a heat detector in the kitchen.

Partially protected (loft and 1st floor level) single stair and open plan ground floor

If the dwelling has an open plan ground floor, fire-resistant partitions must be installed to enclose the escape route, or a fast response sprinkler system installed in the ground floor open plan area designed to BS 9251:2005. To comply as a fast response system, each unit will generally have to be exposed and cover the full open plan area. A fire resisting partition and fire door will be needed to separate the ground floor from the upper storeys and access provided to a suitable escape window at first floor level within the safety zone provided by this door and partition.

All alarms should be mains-powered with standby backup and interlinked so that detection of heat or smoke in one unit operates the alarm in all others. In addition, BS 5839:6 recommends optical smoke detectors in circulation areas with ionisation detectors being preferred for living and dining rooms. Optical sensors are preferred in bedrooms although either type would be considered acceptable.

Alternative escape

When the existing dwelling has only one stair, the top storey should be separated from the lower storeys by fire-resisting construction to give 30 minutes fire resistance. Escape windows should be provided at first floor level.

Dwelling houses with one internal stairway should comply with paragraphs 2.5-2.6 of Approved Document Part B Vol1. Generally it is expected that a protected means of escape route, separating every habitable room and which offers 30 minutes of fire resistance in case of fire is provided leading from the upper floors to a final place of ultimate safety outside the dwelling. On the ground floor the provision of a minimum of two final exits that are separated by use of fire resisting construction should be provided.

The alternative route must be physically separated from the main stair enclosure or where this is not possible have fire-resisting construction between the two stairs. This will ensure that one escape is viable at all times in the event of fire.

The alternative route may be via an external stair, in which case it is important to ensure that any glazed areas and doors which give access to this staircase are sufficiently far enough away to not pose a threat to persons using the stairs.

For further guidance refer to Building Regulation Approved Document B1 (Vol.1) paragraph 2.5 onwards. In all cases

Fire-engineered approach

In certain circumstances it may be possible to provide a comprehensive fire alarm and detection system rather than providing a protected stair (Solution 1 above) or an alternative escape route (Solution 3). It should be

appreciated that 'a comprehensive fire alarm and detection system' is either a Grade A or B system of a type described in BS5839-6 and BS 5839-1 as appropriate (see Option 4 7.3.26/31 CPA Loft Conversion Project Guide 2010). A number of factors must be taken into consideration with regard to choice of system and its design as well as the coverage required (i.e. LD1 /LD2).

These include:

• The probability of fire occurring
• The probability of injury or death of occupants if fire occurs
• The probability of the system operating correctly in the event of fire
• The probability of early detection and warning of occupants in the event of fire
• Any potential weakness in the integrity of stair enclosures and doors onto stairways.

It is considered fundamental to the success of this solution that any openings onto the stairwell from rooms and cupboards should be fitted with doors. Whilst these doors do not need to achieve the full FD20 fire resistance, they must be well fitting in their frames, a maximum of 4mm gap at the head and side is considered acceptable.

Similarly, whilst the physical integrity of the stair enclosure must be maintained, there is no requirement to ensure the full 30-minute fire-resistant standard is achieved.

In all cases where this solution is proposed, it is recommended that **YOU MUST** submit to us a technical report, including associated plans and **specifications from a suitably qualified fire engineer** that supports any scheme submitted under this option.

SUMMARY – key points

Loft conversions

Where a new storey is added through conversion to create a storey above 4.5m, both of the following should apply. The full extent of the escape route should be addressed.

- Fire resisting doors (minimum E 20) and partitions (minimum REI 30) should be provided, including upgrading the existing doors where necessary.

  Where the layout is open plan, new partitions should be provided to enclose the escape route (Diagram 2.2 of the Approved Document).

  ○

  Where it is undesirable to replace existing doors because of historical or architectural merit, the possibility of retaining, and where necessary upgrading, them should be investigated.

- An alternative approach to that described in paragraph 2.21 of the Approved Document would be to comply with all of the following.

  a. Provide sprinkler protection to any open-plan areas.

  b. Provide a fire resisting partition (minimum REI 30) and door (minimum E 20) to separate the ground storey from the upper storeys. The door should allow occupants of the loft room access to a first storey escape windows.

  c. Separate cooking facilities from the open-plan area with fire resisting construction (minimum REI 30

TECHNICAL MEMORANDUM 011
(Edition 1)
BASIC FIRE DOOR REQUIREMENTS

1.0 Introduction

This document has been produced to help clarify what you will be required to submit to our Building Control offices if you are required to justify your proposals relating to timber fire doorset installations.

1.1 This guidance does not cover all aspects relating to the requirements applicable to timber fire doorsets fitted into buildings.

You should always consult relevant Approved Documents (Part B) Fire Safety for further details (refer : https://www.gov.uk/government/collections/approved-documents)

- Modern fire doorsets contribute significantly to the general passive fire safety packages used on most buildings.

- A fire doorset set comprises of door leafs (*consisting of just one or more leafs*), door frame, hinges, locks, and seals. In some cases they can be specifically manufactured to include letter plate slots, glazing apertures, and peep holes.

- To determine the FD rating of fire doors, the manufacturers have their fire doors assessed by subjecting them to a test procedure as specified in BS 476-22:1987 or BS EN 1634-1:2014.

- Fire doorsets are designed by manufacturers and then tested by third party accredited certifiers to a procedure as specified in BS 476-22:1987 or BS EN 1634-1:2014, to assure that specific performance criteria (*relating to integrity and stability*) is met, when correctly installed. i.e. the doorset will resist fire for 30 or more minutes before the doorset fails.

- Fire doors maybe required to be fitted with appropriate spring type door closers (overhead type or concealed type)

- You must fit all necessary ironmongery to your fire doorsets. In most installations for instance unless otherwise specified by the manufacturer you must fit a pair and a half hinges, made entirely from materials that have a minimum melting point of 800°C.

- Fire doors should be hung to give an equal gap across the head, down both jambs

and at meeting edges. Typical gaps to achieve good fire performance is between 2 mm and 4 mm.

- Sliding "Pocket doorsets" which are required to be fire resisting must be justified by the submission of the original manufacturers fire test certificates which covers the complete assembly (i.e. door leafs, frame, seals, runners etc)

2.0 Test Certification submissions

2.1 Any test evidence submitted to our office will be used to verify the fire resistance rating of a doorset or shutter to ensure both of the following – that :

a. It adequately demonstrates compliance in accordance with the door test certificates.

b. It is applicable to the **complete installed assembly**.

3.0 Modification, alteration or supplementation of fire doorsets

3.1 Where fire doorsets are modified or parts supplemented by non-standard parts, or otherwise compromised, we are unlikely to accept those modifications unless justified by the manufacturers (i.e. by "Letter of Authority") to be acceptable. You can also prove that the work was carried out acceptably by obtaining written confirmation evidence from a competent tradesmen who is preferably a member of a recognised quality assurance scheme, such as the 'Q-Mark' Fire Door Installers scheme.

TECHNICAL MEMORANDUM 012
(Edition 1)
FIRE STOPPING

Modern buildings are designed to resist the spread of fire and smoke by the use of materials designed to be either non-combustible or of very limited combustibility. Blocks of flats for instance are designed to "compartmentalise" each dwelling from each other, and so to contain a fire within the dwelling until burnout.

There are a number of guidance's and pieces of legislation that control work carried out on buildings such as :

- Approved Documents – Part B Fire Safety
- Building Regulations - particularly Regulation 7 [materials and workmanship) and Regulation 38 [Fire safety Information]
- CDM Regulations
- BS9999 - Code of practice for fire safety in the design, management and use of buildings
- BS 9991:2015 Fire safety in the design, management and use of residential buildings. Code of practice
- Regulatory Reform (Fire Safety) Order 2005
- The Construction Products Regulation
  etc

Fire stopping
Fire stopping is a fundamental part of the material package required to maintain the fire resisting performance of fire compartments found within modern buildings.
Fire stopping is best defined as the sealing of any openings to prevent fire (including smoke and heat) from passing through multiple building compartments.
The spread of a fire is contained by creating fire resisting compartments, which subdivide the building (vertically or horizontally). Buildings must ensure that any openings and gaps are fire stopped to restrict both lateral and vertical fire spread, for instance through :

- Concealed spaces (voids above ceiling lines or beneath floor surfaces)
- Service ducts (containing pipes, cables etc)
- Penetrations through a fire resisting wall, ceiling or floor

Where a compartment wall or compartment floor meets another compartment wall or an external wall, the junction should maintain the fire resistance of the compartmentation design which your designer has specified.

Plans and specifications
The start of making sure your work complies with building regulations and other legislation starts by making sure that you are working to compliant professionally prepared plans and specifications. You may be asked to supply supporting evidence of all fire stopping systems used together with their performance certificates.

A plan which shows fire stopping provisions and locations of any specific fire stopping measures (such as fire dampers) may be requested by our office which clarifies how and where your contractors have fitted particular fire stopping materials or fittings.

Fire-stopping in general

The following issues must be addressed -

a. Joints between fire-separating elements should be fire stopped
b. All openings for pipes, ducts, conduits or cables to pass through any part of a fire-separating element should be:
   (i) Kept as few in number as possible; and
   (ii) Kept as small as practicable: and
   (iii) Fire-stopped (which in the case of a pipe or duct, should allow thermal movement)

Image : Penetration of cable trays and pipes properly fire-stopped with approved materials in a fire resisting masonry compartment wall

Materials used for fire-stopping

Proprietary fire-stopping and sealing systems (including those designed for service penetrations) which have been shown by test to maintain the fire resistance of the wall or other element can be used. Fire-stopping materials include :

- Cement mortar
- Gypsum-based plasters
- Cement-based or gypsum-based vermiculite / perlite mixes
- Glass fibre , crushed rock, blast furnace slag or ceramic-based products (with or without resin binders)
- Intumescent mastics (including bagged or coiled strip systems)

Each or any of the above materials must only be used in situations appropriate for the particular situation or circumstance.

You may be required to submit your fire-stopping proposals with specifications and performance certificates which justifies your particular fire stopping proposals.

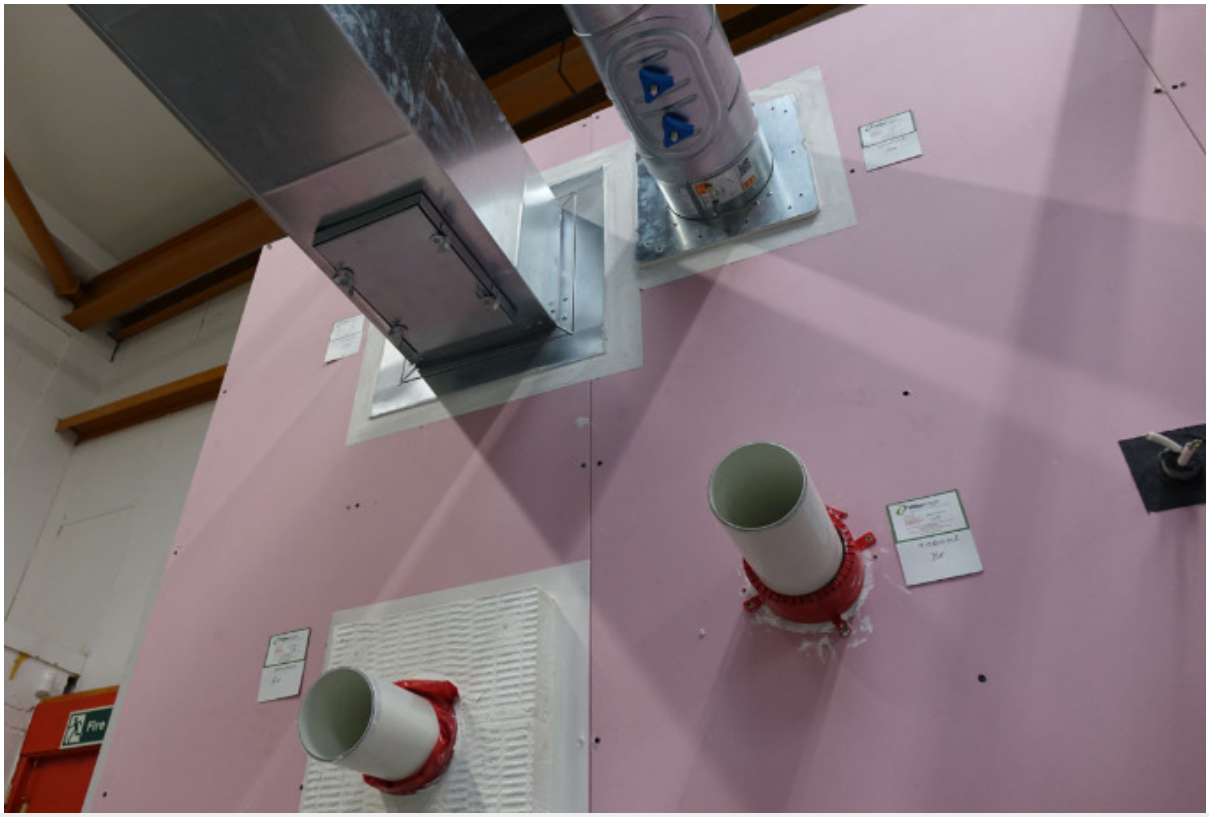


Image 2 : **Showing professionally installed fire dampers on ductwork, fire collars around pipe penetrations, collars around cables – Image from HASMAN LIMITED**

The should be carried out by competent operatives (preferably by 3rd Party Certified Installers – in complex situations in particular)

4.0 RESPONSIBILITY FOR COMPLIANCE (Regulation 7: Building Regulations) – It remains at all times that responsibility for carrying out building work that is compliant, and carried out in accordance with compliant professionally prepared plans is an obligation placed upon the building contractor, project managers, any owner appointed professional agent (Architects, Surveyors etc), and ultimately the building owner.

This document only provides a very general overview of your responsibility to carry out compliant work, you should seek advice from your professional designers.

TECHNICAL MEMORANDUM 013 PART 2

(Edition 1)

LAYING UNDERGROUND PIPEWORK TO SPECIFIC FALLS

QUICK REFERENCE GUIDE TABLES EXTRACTED FROM THE APPROVED DOCUMENTS PART H DRAINAGE

- The following tables have been extracted from the Approved Document Part H (Drainage). The extracts can be used as a quick reference to find the falls (gradients) required when laying underground pipes carrying foul water or surface rainwater.
- Please note that you should always seek guidance from your professional advisors if you have unusual circumstances on your site, such as very un-even terrain, or requirements to remove water from basement levels etc.

Materials for pipes and jointing

Table 7 Materials for below ground gravity drainage

Material	British Standard
Rigid pipes	
Vitrified clay	BS 65, BS EN 295
Concrete	BS 5911
Grey iron	BS 437
Ductile iron	BS EN 598
Flexible pipes	
UPVC	BS EN 1401+
PP	BS EN 1852+
Structure walled plastic pipes	BS EN 13476

+ Application area code UD should normally be specified

Note: Some of these materials may not be suitable for conveying trade effluent

Paragraph and table extracted from the Approved Document Part H – Drainage
Any of the above materials shown are suitable for below ground gravity drains.

Table 6 Recommended minimum gradients for foul drains

Peak flow (litres/sec)	Pipe size (mm)	Minimum gradient (1 in ...)	Maximum capacity (litres/sec)
< 1	75	1:40	4.1
	100	1:40	9.2
> 1	75	1:80	2.8
	100	1:80*	6.3
	150	1:150†	15.0

Notes:

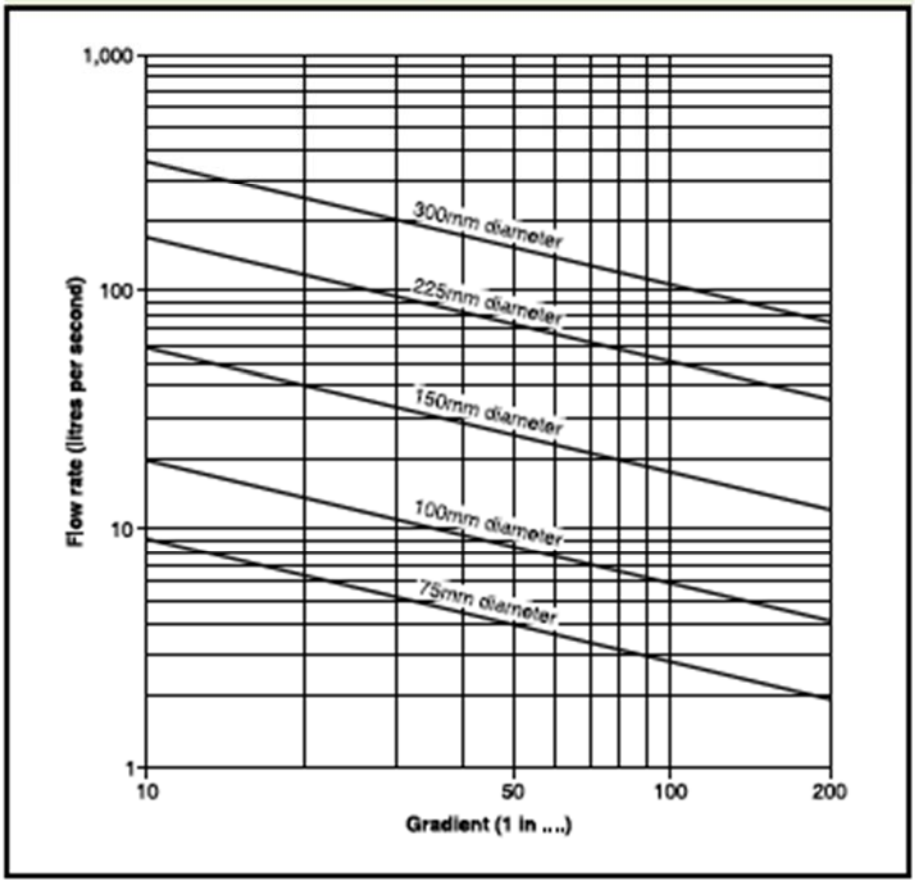
* Minimum of 1 WC

† Minimum of 5 WCs

Paragraph and table extracted from the Approved Document Part H - Drainage

3.15 75mm and 100mm rainwater drains should be laid at not less than 1:100. 150mm drains and sewers should be laid at gradients not less than 1:150 and 225mm drains should be laid at gradients not less than 1:225. For minimum gradients for larger pipes see BS EN 752-4 (see paragraph 3.36).

Diagram 3 **Discharge capacities of rainwater drains running full**



Paragraph and table extracted from the Approved Document Part H - Drainage

Table 11 Minimum dimensions for access fittings and inspection chambers

Type		Depth to invert from cover level (m)	Internal sizes: Length x width (mm x mm)	Internal sizes: Circular (mm)	Cover sizes: Length x width (mm x mm)	Cover sizes: Circular (mm)
Rodding eye			As drain but min. 100			Same size as pipework [1]
Access fitting						
small	150 diam.	0.6 or less,				
	150 x 100	except where	150 x 100	150	150 x 100 [1]	Same size as
large	225 x 100	situated in a chamber	225 x 100	225	225 x 100 [1]	access fitting
Inspection chamber						
shallow		0.6 or less	225 x 100	190 [2]	–	190 [1]
		1.2 or less	450 x 450	450	Min. 430 x 430	430
deep		> 1.2	450 x 450	450	Max. 300 x 300 [3]	Access restricted to max. 350 [3]

Notes:

1. The clear opening may be reduced by 20mm in order to provide proper support for the cover and frame.
2. Drains up to 150mm.
3. A larger clear opening cover may be used in conjunction with a restricted access. The size is restricted for health and safety reasons to deter entry.

Responsibility for compliance

People who are responsible for building work (e.g. agent, designer, builder or installer) must ensure that the work complies with all applicable requirements of the Building Regulations. The building owner may also be responsible for ensuring that work complies with the Building Regulations. If building work does not comply with the Building Regulations, the building owner may be served with an enforcement notice.

TECHNICAL MEMORANDUM 013 (Part 1)

(Edition 1)

NEW MANHOLES / INSPECTION CHAMBERS USING BRICKWORK FOR FOUL WATER REMOVAL IN SMALL DOMESTIC PROJECTS

Whilst building regulations does not control the aspect relating to the quality and look of your final building project. There are certainly many aspects of your build that you should pay attention to. The construction of new brickwork manholes is one particular component that should be built robustly.

You should note that manholes (or inspection chambers) can be built using proprietary pre-formed concrete rings (or rectangular sets) or pre-formed molded plastic chambers.

Regulation 7 within The Building Regulations 2010 – Materials and Workmanship states :

Regulation

Materials and workmanship

7. (1) Building work shall be carried out—

(a) with adequate and proper materials which—

(i) are appropriate for the circumstances in which they are used,

(ii) are adequately mixed or prepared, and

(iii) are applied, used or fixed so as adequately to perform the functions for which they are designed; and

(b) in a workmanlike manner.

Regulation 7 within The Building Regulations 2010 furthermore states that :

Responsibility for compliance

People who are responsible for building work (e.g. agent, designer, builder or installer) must ensure that the work complies with all applicable requirements of the Building Regulations. The building owner may also be responsible for ensuring that work complies with the Building Regulations. If building work does not comply with the Building Regulations, the building owner may be served with an enforcement notice.

Approved Document Part H – Drainage provides other more detailed guidance relating to the size, positioning, bedding and other materials that may be used for the construction of manholes or inspection chambers.

Photo 1

The above photo 1 is an example of a very poorly constructed brick drainage inspection chamber.

It has not been constructed in accordance with current codes of practice and fails to meet the basic expectations contained with Regulation 7 of the Building Regulations 2010, relating to the materials and the workmanship used to construct the underground chamber for the purpose of foul water handling.

This standard of construction shown above would therefore not be approved by our technical staff.

In general, the following recommendations should be followed when constructing manholes or inspection chambers:

1. Use 229mm (9") Class B Engineering quality clay brickwork (BS EN 771-1) laid in English bond using 1:3 ratio sand cement minimum mix to form the chamber wall enclosure.

2. Internal channels must be formed using impervious materials fit for purpose (e.g. formed using plastic channels, or vitrified clay. Sand cement must not be used to form drainage channels.

3. Manhole brickwork must be built up from a 150mm concrete base

4. Vertical faces within the manhole chamber must not be internally rendered with cement etc. although the external faces of the chamber can be rendered if you choose. Only Internal benching can be formed using sand cement.

5. Manhole cover or concrete manhole "roofing" to be of adequate load resistance for your conditions (i.e. Heavy duty covers used if traffic passes over the manhole.

6. At least 2 flexible joints should be provided (as r"Rockers") within 0.9m of the manhole, one each side of the chamber on the pipe run.

7. Internal ladders to be used in manholes over 4.5m deep

8. Pipes over 0.15m dia in deep manholes should have brick-on-edge arch formed over them.

TECHNICAL MEMORANDUM 014
(Edition 1)

AIR LEAKAGE TESTING OF DOMESTIC BUILDINGS WITH A USEFUL FLOOR AREA OF LESS THAN 1000m2

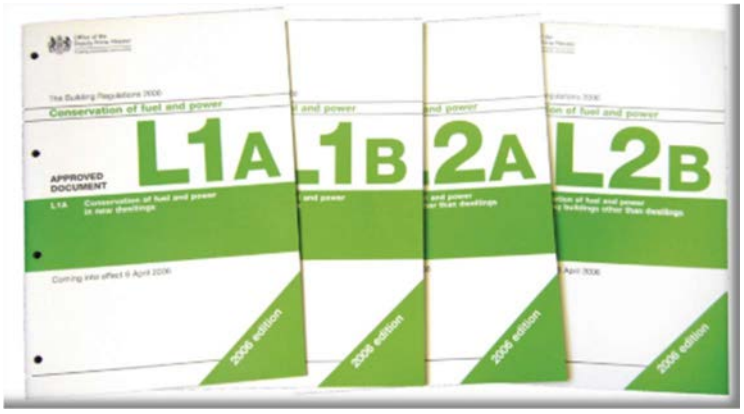
Material change of use

Regulation 5 defines a 'material change of use' in which a building or part of a building that was previously used for one purpose will be used for another.

The Building Regulations set out requirements that must be met before a building can be used for a new purpose. To meet the requirements, the building may need to be upgraded in some way, where perhaps existing thermal elements (roof, wall, floors etc) may have to be upgraded, and additionally other features may need to be addressed by upgrading (i.e. new space heating provisions, energy efficient lighting, thermally efficient glazing)

New dwellings and Material changes of use

Approved Document L1A applies to the conservation of fuel and power in newly erected dwellings.



The act of erecting a **new dwelling (i.e. a new dwelling being erected on perhaps totally new foundations, with new walls, floors, roof, drainage, fenestration, gas, electrics, etc)** - is not classified as a material change of use.

Where an existing building envelope is subjected to a "material change of use", *e.g. Was originally an Office building, and now will be converted and therefore changed into self-contained dwelling flats.*

Then Approved Document L1B will apply where a dwelling is being created within in an existing building as the result of a material change of use of **all** or **part** of the building, or as part of that building work process, the building is being extended.

Air leakage testing

NEW DWELLINGS :

If you are constructing **NEW dwellings** then Approved Document L1A states that, with few exceptions, you must perform an air leakage test. For developments of two or more dwellings an air leakage test should be carried out on the lower of:

- *Three units of each dwelling type; or*
- *50% of all instances of that dwelling type.*

For developments where no more than two dwellings are constructed, it may be possible to avoid the need for any pressure testing by using an assumed value of 15m3/h/m2 within the DER/TER calculations. Your SAP assessor will be able to confirm if this is the case for your dwelling, and also will offer further advice if your project involves mixed use developments.

DWELLINGS FORMED BY A MATERIAL CHANGE OF USE:

Where an existing building has been subjected to a material change of use, then an air leakage test will not be required subject to consideration of the next paragraph.

You should note that there maybe instances whereby building projects which become subject to Regulation 28 (Consequential Improvements) as a consequence of having a total useful floor area over 1,000m2, where building work consists of or includes —

(a) an extension;
(b) the initial provision of any fixed building services; or
(c) an increase to the installed capacity of any fixed building services

may give rise none-the-less to a need for air tightness testing, you should consult your professional advisors accordingly for advice.

SUBMISSION OF STANDARD ASSESSMENT PROCEDURE DOCUMENTS (SAP/EPC)

You are none-the-less required to submit energy performance certificates appropriate for your project development which demonstrates compliance with the Building Regulations.

A SAP EPC refers to an Energy Performance Certificate issued by an On Construction Domestic Energy Assessor using SAP methodology and software [New dwelling] or dwellings created by conversion or change of use, are required to have SAP Calculations carried out.

- **SAP 2012** (Software) is used to produce Energy Performance Certificates for NEWLY CREATED DWELLINGS.
- **RdSAP 2012** (Software) is only used to produce Energy Performance Certificates for EXISTING DWELLINGS. Note : RdSAP 2012 v9.94 (third link below) should be used from 22nd September 2019.

TECHNICAL MEMORANDUM 015
(PART1 - Edition 1)

BASIC INTERMITTENT EXTRACT FAN PROVISIONS
PART 1 – SOME BASIC KEY TERMS !

General guidance Approved Document Part F Ventilation

The following technical guidance sheet provides basic general information in respect to extract fan ventilation. The Approved Document Part F makes clear that intermittent extract by use of powered fans must extract to the outside air particularly when fitted within areas that generate high levels of moisture, stale air or where smells occur. Extract fans assist in quickly maintaining comfortable and healthier internal environments within dwellings.

This sheet only addresses very basic intermittent extract fan provisions in your home. It makes no comments with respect to the provision of any other vents or windows.

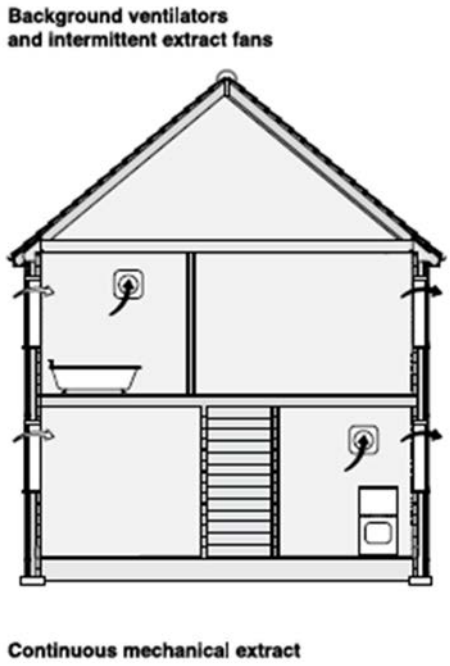


Image 1

The image above is found within the Approved Document Part F. It shows that when basic provisions regarding specifically intermittent extract fans – the following key terms should be understood.

Kitchens, bathrooms, shower rooms, some utility rooms (with white goods and washing utilities) and water-closets may require basic intermittent extract fans.

Typically cooker hood extractors are fitted to extract to the external air in order to quickly control and reduce the build up of moisture that could cause mold growth within dwellings.

Re-circulating cooker hood fans using only carbon filtration for odour removal are likely to return moisture ladened air back into the kitchen, and are therefore unacceptable unless other provisions for the removal of moist air has been provided elsewhere in compliance with the Approved Document Part F or the Domestic Services Compliance Guide.

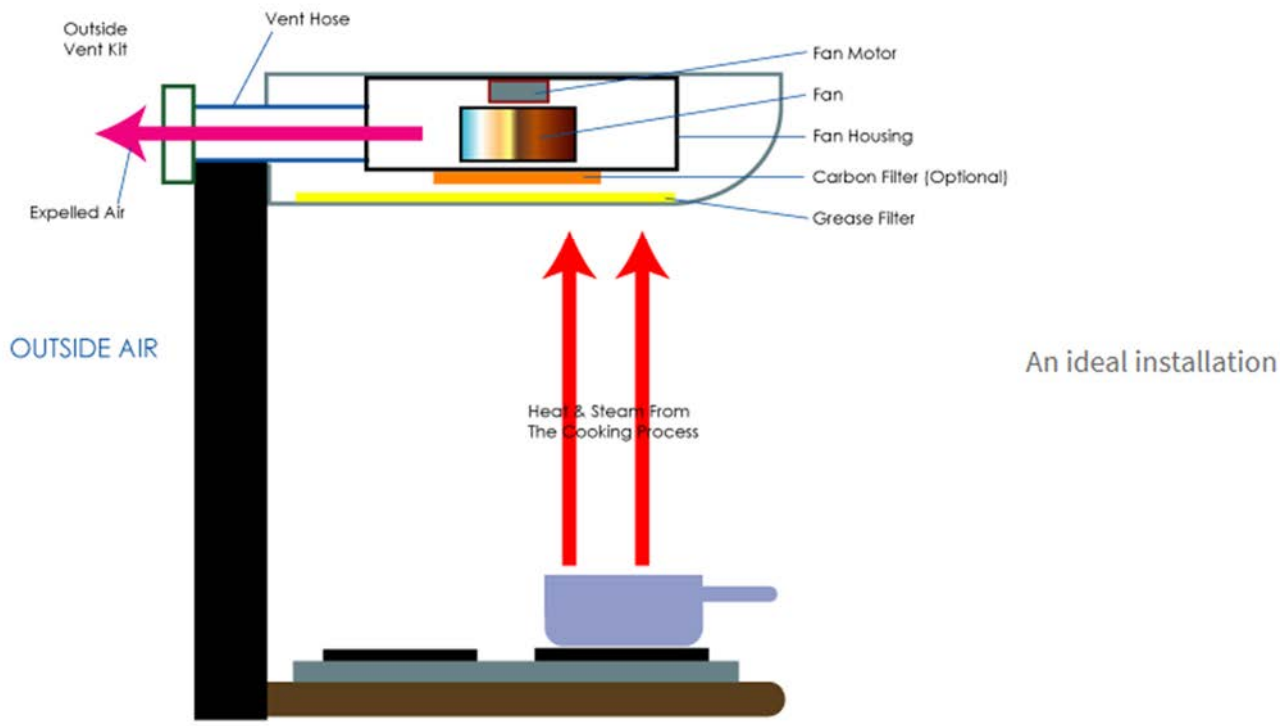


Image 2. Typical Cooker hood extractors- installation diagrams :

Image 3. Typical result of a kitchen not fitted with intermittent extract fans which removes moist air to the outside air.

SECTION 3 [GENERAL GUIDANCE] APPROVED DOCUMENT PART F

The following "Key Terms" are noted within the Approved Documents PtF that clarifies what is particular expected :

- ***Extract ventilation*** is the removal of air directly from a space or spaces **to outside**. Extract ventilation may be by natural means (e.g. by ***passive stack ventilation***) or by mechanical means (e.g. by an extract fan or central system).
- ***Intermittent operation*** is where a mechanical ventilator does not run all the time, usually running only when there is a particular need to remove pollutants or water vapour (e.g. during cooking or bathing). Intermittent operation may be under either ***manual control*** or ***automatic control***.
- ***Purge ventilation*** is manually controlled ventilation of rooms or spaces at a relatively high rate to rapidly dilute pollutants and/or water vapour. Purge ventilation may be provided by natural means (e.g. an openable window) or by mechanical means (e.g. a fan).

Table 5.1a **Extract ventilation rates**

Room	Intermittent extract	Continuous extract	
	Minimum rate	Minimum high rate	Minimum low rate
Kitchen	30 l/s adjacent to hob; or 60 l/s elsewhere	13 l/s	Total extract rate should be at least the ***whole dwelling ventilation*** rate given in Table 5.1b
Utility room	30 l/s	8 l/s	
Bathroom	15 l/s	8 l/s	
Sanitary accommodation	6 l/s	6 l/s	

Image 4: Showing extract from the Approved Document Part F – typical expected extract fan rates.
EXATRACT FANS IN SANITARY CONVENIENCES : The run times required to remove excess moisture must be set and commissioned by your installer, this is usually carried out by adjusting manufacturer fitted internal timers.

Image 5. Showing extract fan positions (2) extracting stale or moist air to the outside air.

For further information you are advised to consult:

- The Approved Document Part F
- The Domestic Services Compliance Guide DCLG

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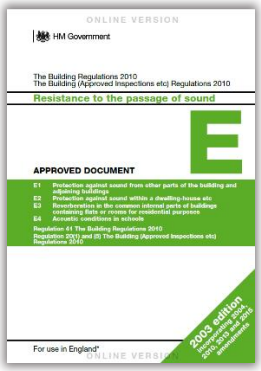
TECHNICAL MEMORANDUM 016

PRE-COMPLETION SOUND TESTING GENERAL INFORMATION UNDER PART E BUILDING REGULATIONS


ONLINE VERSION

HM Government

The Building Regulations 2010
The Building (Approved Inspections etc) Regulations 2010

Resistance to the passage of sound

E

APPROVED DOCUMENT

E1 Protection against sound from other parts of the building and adjoining buildings
E2 Protection against sound within a dwelling-house etc
E3 Reverberation in the common internal parts of buildings containing flats or rooms for residential purposes
E4 Acoustic conditions in schools

Regulation 41 The Building Regulations 2010
Regulation 20(1) and (6) The Building (Approved Inspections etc) Regulations 2010

2003 edition
incorporating amendments 2004, 2010 and 2013

For use in England*

ONLINE VERSION

Our initial contract documents issued to all clients makes clear what our expectations are with respect to documents submitted to us relating to pre-completion testing UNDER Part E of the Building Regulations 2010.

We expressly list this requirement within our Acknowledgement Packs issued to all of our clients.

We clearly establish the following, in that :

The person carrying out the building work should arrange for sound insulation testing to be carried out by a test body with appropriate third party accreditation.

Test bodies conducting testing should preferably have UKAS accreditation (or a European equivalent) for field measurements.

The Department of Communities and Local Government also regards members of the Association of Noise Consultants (ANC) Registration Scheme as suitably qualified to carry out pre-completion testing.

We therefore only accept pre-completion test reports from ANC Registered bodies.

- Sound insulation testing to demonstrate compliance with Requirement E1 should be carried out on site as part of the construction process, and in the Approved Document Part E it is referred to as pre-completion testing.

- Under Regulation 41 and Regulation 20(1) and (5), the duty of ensuring that appropriate sound insulation testing is carried out falls on the person carrying out the building work, who is also responsible for the cost of the testing.

- Therefore, the guidance in this section is addressed in the first place to persons carrying out the work (and to testing bodies employed by them).

- The Secretary of State expects that as a building control body we must determine, for each relevant development, the properties selected for testing.

Testing should be carried out for :

a. purpose built dwelling-houses and flats;
b. dwelling-houses and flats formed by material change of use;
c. purpose built rooms for residential purposes;
d. rooms for residential purposes formed by material change of use.

The Approved Document Part E - Sound

The sound insulation testing should be carried out in accordance with the procedure described in Annex B of this Approved Document Part E, which is the procedure formally approved by the Secretary of State for the purpose of paragraph (2)(a) of Regulation 41 and paragraph (2)(a) of Regulation 20(1) and (5) – Building Regulations 2010.

The results of the testing must be recorded in the manner described in paragraph 1.41 of Section 1 of the Approved Document Part E, which is the manner approved by the Secretary of State for the purposes of paragraph (3)(a) of Regulation 41 and paragraph (3)(a) of Regulation 20(1) and (5)) – Building Regulations 2010.

The test results must be given to our office as a building control body in accordance with the time limits set down in Regulation 20(1) and (5) (in cases where it is being done by us as an Approved Inspector).

TECHNICAL MEMORANDUM 017

BUILDING FOUNDATIONS

Trees local to any proposed new building can create issues with your proposed building.

Your designers should always in the first instance and <u>before any building work commences</u>:

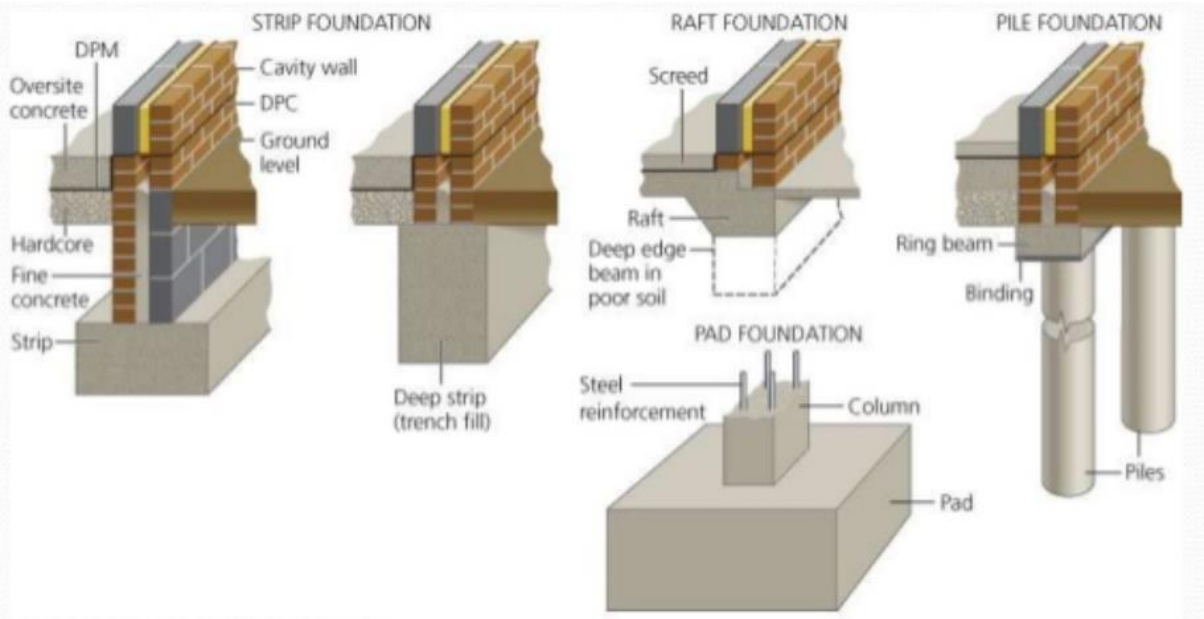
1. Produce and supply you with structural plans which identify any local trees

2. Produce a foundation design suitable for the soil condition and which takes into account any tree root activity.

3. Produce a foundation design that addresses any localised drains running through, under or local to your proposed building foundations.

   The following foundation types are commonly adopted :

   a) Traditional Strip foundation
   b) Deep Strip - Trench fill foundation
   c) Raft foundation
   d) Piled foundations
   e) Pad foundation



4. Design plans that show all relevant floor levels and site boundaries, including any existing below ground drains.

Please be aware that if insufficiently designed plans have been submitted to our building control offices, and upon carrying out our first site inspections, trees, below ground drainage, or other sub-structural issues are identified, our surveyors will most likely NOT APPROVE foundation excavations which appear to us as not having taken into account, existing tree root activity, local below ground drains or other existing sub-structures e.g cellars, or wells etc

Approved Document Part A STRUCTURE provides ample guidance relating to the structural aspects of your proposals.

Trees and other vegetation can affect moisture content considerably, leading to soil shrinkage or swelling (commonly known as heave) where clay subsoils are present.

This can cause cracking and movement of foundations and damage to whole structures.

And it is not just trees in close proximity to your site that pose danger. Trees up to 30m away have been known to draw moisture from the soil at a proposed building site.

The worst trees to be aware of are:

- oak (all varieties)
- willow (all varieties)
- hawthorn
- elm
- cypress (Leyland, Monterey, Lawson's)
- poplar (all varieties)

But all trees need to be considered.

Different trees have different water demands, so it is important to also consider and identify trees on your site and adjacent sites.

Please also be aware that your neighbours may be reluctant to trim or to pollard their trees. Their trees may continue to grow and mature quickly over the forthcoming years, and so may eventually have an effect upon your building's foundation.

Once you have identified your trees, you may wish to use the **NHBC Chapter 4.2 Building near Trees** Tables to give you an idea how deep your foundation trenches will need to be. It is advisable that an appropriately qualified designer produces foundation designs.

The depth of foundation is determined by the:

- plasticity index of soil
- water demand of the tree
- mature height of the tree
- distance of relevant trees to nearest part of foundations and distances elsewhere if stepping foundations
- allowance for climatic conditions

Because the **NHBC Chapter 4.2 Building near Trees** calculator allows you to select the actual plasticity index of the soil (if known from testing), it gives more accurate results for foundation depths, which can save you having to dig deeper than actually necessary.

The **NHBC Chapter 4.2 Building near Trees** covers the vast majority of trees found in the UK.

If a tree is not listed you should consult a structural engineer and an arborist for advice.

Site assessment

A desk study and initial walk over of your site and surrounding area should be carried out by a suitable person to identify any potential hazards and problems at an early stage.

Items to be taken into account should include;

- Geology of the area including any protection measures required for Radon ground gas.
- Landfill and tipping including any protection measures required for methane and carbon monoxide ground gases and foundation design requirements.
- Surface and ground water including flooding.
- Soils and previous industrial, commercial or agricultural uses including any protection measures required for ground contaminates.
- Mining and quarrying including any special foundation design requirements.

Further guidance on site preparation and the resistance to contaminants and moisture is provided in Approved Document Part C. Typical construction details in Part A of this guidance contains details on how to achieve basic and full radon protection in sub structures.

Sources of information include: Local Authority (building control, planning departments, environmental health departments), Environment Agency, Coal Authority, Utility Companies, Health Protection Agency, British Geological Survey, Ordinance Survey Maps, etc. Where hazards are suspected, a detailed site investigation should be carried out by a specialist.

TECHNICAL MEMORANDUM 018

Design and installation of fire safety provisions in dwelling houses with intended open plan arrangements

(Sprinklers, Water Mist, Fire Curtains, etc)

This guidance note only addresses basic provisions to safeguard life safety within dwelling houses. It does not address the provision of any passenger lifts or staircase design issues. Useful definitions have been footnoted at the end of this document.

Where open plan arrangements are intended within your dwelling house designs which may or may not have access rooms or inner rooms, which results in no protected means of escape routes, or any suitable alternative means of escape being provided which leads to a final place of safety, then you must provide compensatory measures that safeguards life-safety of all building occupiers.

Below we have attached an extract from the 2019 Approved Document Vol.1 – Fire safety, that gives the basic fire safety provisions that you should aim to achieve if you need to escape from a residential dwelling house in this case.

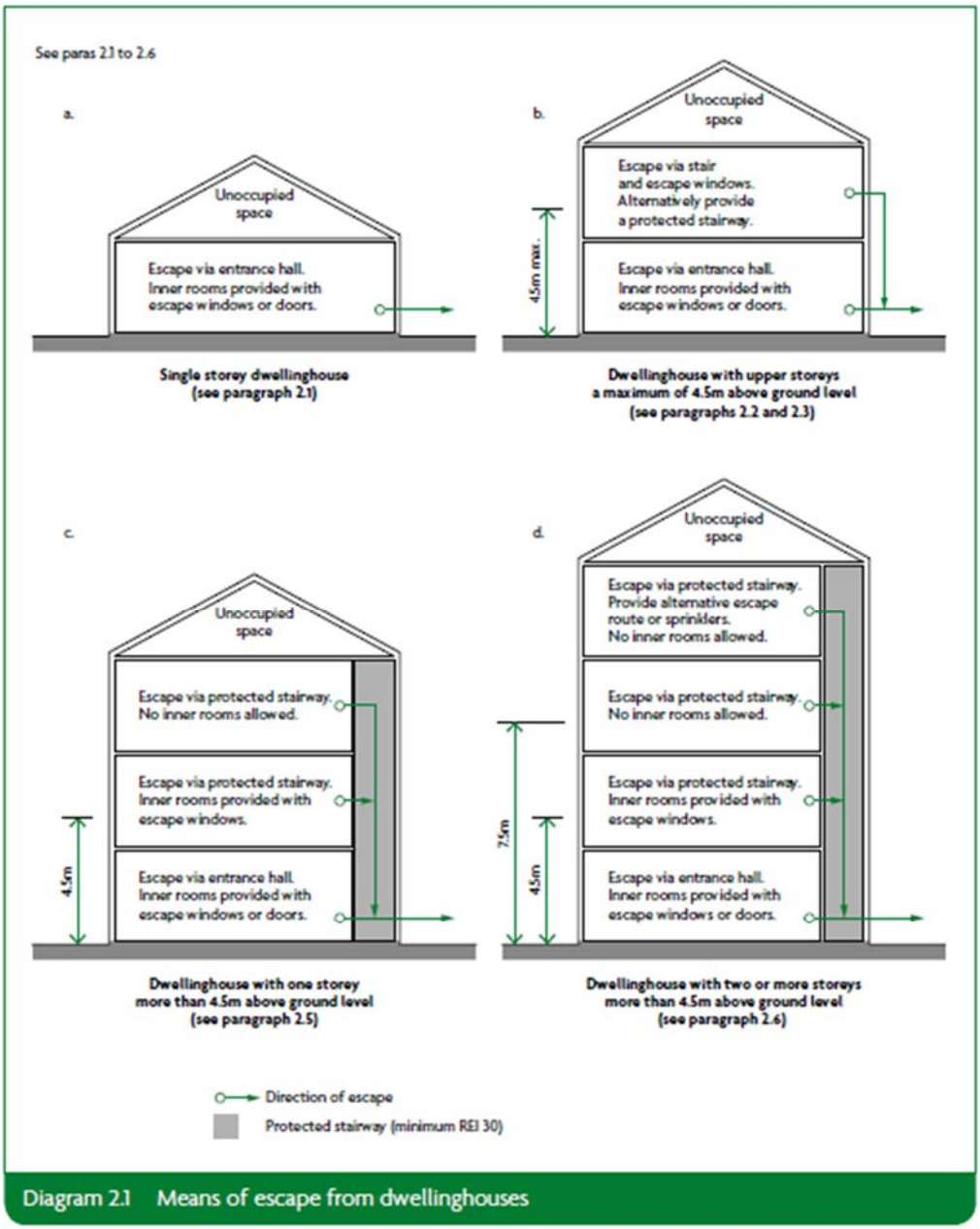


Diagram 2.1 Means of escape from dwellinghouses

Extracted from the Approved Document Vol1, Fire safety Dwellings

You may need to appoint a Fire Safety Engineer to assess your proposals and to develop a fire strategy and design package for submission to building control and the fire authority to consider, especially where dwelling houses with floors above 7.5m are being altered.

The Institute of Fire Engineers or **The Chartered Association of Building Engineers** could be contacted to find a suitable designer who can assist you.

We would initially recommend that you install suitable fire doorsets and partitions that re-introduce physical fire resisting walls and doors that helps to achieve a protected escape route leading to a final place of safety for all building occupiers, as well as provides an easy way to both contain and to reduce the spread of smoke and fire within the building.

To create a life safe internal building layout for escape in case of fire, the provision of various passive or active installations can incorporated within your designs. Your professional designer should always be consulted so that compliant plans can be produced and submitted to our offices.

To be clear a **"passive"** installation relates to provisions that provide inherent fire safe construction characteristics by virtue of its composition safeguarding building occupiers e.g **non-combustible** (or limited combustibility) fire resisting walls, ceilings, linings, doors, glass components, or other fire resisting separating construction.

An **"active"** installation measure relates to equipment and facilities that primarily react to a life threatening event following its detection, such smoke or fire, providing a reaction that assists in either suppressing or extinguishing a fire, or even ventilating smoke build up, and re-establishing protective routes leading to a place of safety.

1. **Passive measures – you can easily carry out :**

You can merely re-introduce fire resisting corridors, and passageways, with associated fire rated doors that create a protected fire escape route leading to a final place of safety externally.

2. **Active measures – where you must demonstrate compliance by using professional competent persons** *(Table 1)* **:**

Installation type	Designs must meet these relevant British Standards
Residential water sprinklers	**BS 9251 or BS EN 12845**
Residential water mist systems	**BS 8458**
Automated fire curtains	**BS 8524**
Smoke ventilation provisions to	**BS EN 12101**
Enhanced early warning installations associated to the above active measures (Heat / smoke detectors	**BS 5839**

Design of Sprinkler Installations :

Where required, sprinkler systems should be provided **throughout the building** or **separated part**, unless acting as a compensatory feature to address a specific risk. They should be designed and installed in accordance with the following. For residential buildings, the requirements of **BS 9251**, as indicated in the above table.

For non-residential buildings, or residential buildings outside the scope of **BS 9251**, the requirements of **BS EN 12845**, including the relevant hazard classification together with additional measures to improve system reliability and availability as described in Annex F of the standard.

Any sprinkler system installed to satisfy the requirements of Part B of the Building Regulations should be provided with additional measures to improve system reliability and availability and is therefore to be regarded as a life safety system.

However, there may be some circumstances in which additional measures to improve system reliability and availability specified in Annex F of **BS EN 12845** are inappropriate or unnecessary.

If the provisions in a building vary from those in the Approved Document Part B, sprinkler protection can also sometimes be used as a compensatory feature.

BS 9251 makes additional recommendations when sprinklers are proposed as compensatory features.

All designs relating to systems contained in standards mentioned in table 1 above must be carried out by appropriately qualified competent persons. Your designs must be submitted to our offices prior to installation.

Useful Definitions:

1. **Access room -** A room that the only escape route from an inner room passes through.

2. **Inner room -** Room from which escape is possible only by passing through another room (the access room).

3. **Means of escape -** Structural means that provide one or more safe routes for people to go, during a fire, from any point in the building to a place of safety.

4. **Protected entrance hall/landing -** A circulation area, consisting of a hall or space in a flat, that is enclosed with fire resisting construction other than an external wall of a building.

5. **Fire doorset -** A door or shutter which, together with its frame and furniture as installed in a building, is intended (when closed) to resist the spread of fire and/or gaseous products of combustion and meets specified performance criteria to those ends.

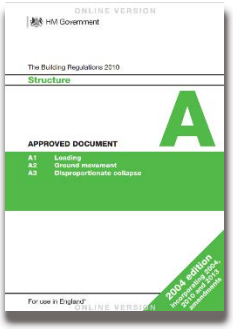
6. **Alternative escape routes -** Escape routes that are sufficiently separated by direction and space or by fire resisting construction to ensure that one is still available if the other is affected by fire.

   NOTE: A second stair, balcony or flat roof which enables a person to reach a place free from danger from fire is considered an alternative escape route for the purposes of a dwellinghouse.

   ***Dwellinghouse** Does not include a flat or a building containing a flat.

TECHNICAL MEMORANDUM 021

Structural engineering information submitted to building control



Introduction

This guidance note is intended to give guidance to structural engineers in England and Wales on the information that needs to be submitted in support of a Building Regulations application in order to demonstrate compliance with the Building Act 1984 and the Building Regulations 2010.

This is to enable the Building Control body to assess your submissions more effectively, and to give a targeted and efficient response.

When to submit?

This information does not necessarily have to be submitted at the time of the application. This is because structural information is often required in response to conditions that are attached to an approval.

Therefore, structural calculations and drawings can be submitted when the design is sufficiently developed. However, you should ensure that this is submitted in advance of the works commencing to reduce the potential risk of abortive work. This is particularly relevant to foundation design and innovative design solutions.

For minor projects, it would be expected that all information was submitted with the application.

What to submit?

Design summary

You should submit a design summary with every submission which contains the following, if relevant:

- a list of the structural design codes with which it complies
- an explanation of the basis of design. This requires sufficient detail to allow others to understand the structural principles used

• the class of the building for purposes of disproportionate collapse design (Table 11 of Approved Document A). If the building is in a number of classes, describe the division • a description of the measures taken to guard against progressive collapse

• a description of the load path to the foundations and how lateral stability is achieved (with illustrations as required to give sufficient clarity)

• the name of the organisation, or individual, who has overall responsibility for the stability of the structure as required by the design codes

• a schedule of the software used, and for what purpose; confirming that its application and limitations are understood and that the results have been verified

• a statement of the qualifications of the person undertaking the design, whether the design has been subject to any in-house or third party checking, and the name and qualifications of the person doing that checking

All of these items should be applicable to most projects. If they are not, there is no need to submit unnecessary information.

Design

The design should then be submitted, in a clear and readable format, with clearly referenced pages. Elements should be consistently referenced and highlighted on plans.

Design submissions are not necessarily required for all elements, but you should include the design for typical elements, all transfer structures, unusual and safety-critical elements. Foundation design and assessment of any effects on existing structure should also be submitted.

Supporting documentation, such as results of any site investigation or tests, should also be included. If unsure, it is best to discuss with your Building Control body first.

What codes of practice can be used?

Building Regulations do not preclude any method of design, provided you can justify its acceptability.

Approved Document A refers to the **Eurocodes as an acceptable method of design**, and as the most up to-date code it would be deemed to be acceptable to use them. Following Brexit we await the Governments advice and update with regard to any updated codes of practice acceptable within the UK.

Older codes which are not maintained are less likely to reflect current design practices, and issues which have **subsequently been found to be a problem** will not have been incorporated.

Therefore**, if you wish to use any design standard other than the Eurocodes**, you should justify its application.

You should not mix codes, without appropriate justification.

This guidance note has been prepared by the Institution of Structural Engineers' Business Practice and Regulatory Control Committee - February 2015, and has been accepted as prudent guidance by Building Control Surveyors Corporate Approved Inspectors for users of its services.

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TECHNICAL MEMORANDUM 022
(5 page document)

Houses in Multiple Occupation
General guidance relating to proposed fire alarm installations

Introduction

The installation of automatic fire detectors is required in new houses, flats and maisonettes in order to satisfy building regulations .

In existing houses in multiple occupation, the installation of an automatic fire detection and fire alarm system is normally required by the relevant enforcing authorities as part of an overall fire safety package.

This basic guidance gives information of the basic fire detection and alarm systems together with the system gradings and typical configurations relating to houses in multiple occupation only. This document does not amount to a design specification.

You are advised to always consult your professional designers and installers relating to compliant installations appropriate for your project circumstances, as well as consulting the relevant British Standards and Approved Documents.

Design considerations/grades of system

BS 5839: part 6 grades fire detection and alarm systems for residential premises according to the complexity of the system. For the purpose of specifying fire detection and alarm systems and the associated engineering design parameters, **there are six grades**.

For houses used in multiple occupation **grade A and grade D are most relevant**, but all six grades are described in table 1 as a general overview of systems listed.

Table 1: Grades of automatic fire detection and warning systems as specified in BS 5839: part 6 (2004)

System Grade	Description
GRADE A	A fire detection and alarm system that is designed and installed in accordance with the recommendations of BS 5839: part 1 (2002), except clauses relating to alarm audibility, alarm warnings for the hearing-impaired, standby supplies, manual call points and radio-linked systems, which are replaced by part 6. This comprises a system of electrically operated smoke and/or heat detectors which are linked to a control panel. The control panel must conform to current BS 5839: part 4 (or equivalent). In general the system must incorporate manual call points which should be located next to final exits, and, in larger multi-storey properties, on each landing. The alarm signal must achieve sound levels of not less than 65dB (A) in all accessible parts of the building and not less than 75dB(A) at all bed-heads when all doors are shut, to arouse sleeping persons.

GRADE B	A fire detection and alarm system including detectors (other than smoke or heat alarms), alarm sounders and control and indicating equipment which either conforms to BS EN 54-2 (power supply to BS EN 54-4) or to a simpler type laid out in annexe C of BS 5839: part 6.
GRADE C	A system of fire detectors and sounders (which may be combined in the form of smoke or heat alarms) connected to a common power supply with both mains and a standby supply, with an element of central control – for example a small dedicated fire control panel.
GRADE D	A system of one or more mains-powered smoke (or heat) alarms each with integral battery standby supply. These are designed to operate in the event of mains failure and therefore could be connected to the local lighting circuit rather than an independent circuit at the dwelling's main distribution board. There is no control panel.
GRADE E	A system of one or more mains-powered smoke (or heat) alarms with no standby power supply. This grade of system will not function if mains power is disconnected or interrupted. It must therefore be wired to a dedicated circuit at the dwelling's main distribution board.
GRADE F	A system of one or more battery-powered smoke alarms. These are not recommended in HMOs. *note: in grades D, E, and F, where more than one alarm is installed they must be interlinked.*
PLEASE NOTE THAT THIS GUIDANCE DOES NOT ADDRESS ESCAPE LIGHTING PROVISIONS	

Mixed grade systems

Is an arrangement whereby two different grades of fire detection and fire alarm system are provided within the same premises for the purpose of satisfying two different fire safety objectives.

These systems are installed to meet differing life safety objectives and may be to differing grades, having regard for the need to avoid false alarms from one dwelling unit affecting all occupiers, and any pertaining exceptions or circumstances relating to the subject premises. An example of such an exception is a House in Multiple Occupation (HMO) that has three or more storeys.

Table 1 of BS 5839: part 6 recommends a mixed system for HMOs of three storeys and above (grade A for communal areas and grade D within individual dwelling units). However, for shared house HMOs of normal risk on the basis of risk assessment, this guidance does not recommend a mixed system as detection is not normally recommended within bedrooms in this type of accommodation.

A "mixed grade system" results in a mixture of fire detection and alarm system grades, that meets both life safety objectives. You should although be aware that the objectives could be met by a single system which has detectors sited in accordance with BS 5839-1 and that incorporates smoke detectors in communal escape routes and in the circulation areas within dwellings (and detectors in any rooms in which protection is necessary within dwellings).

Level of protection:

Types of system BS 5839: part 6 (2019) recommends various levels of coverage for detection within premises, based on risk.

These are outlined below in table 2.

Table 2: Levels of coverage of automatic fire detection and warning systems as specified in BS 5839: part 6 (2019)

SYSTEM COVERAGE	DESCRIPTION
LD1	*A system installed throughout the premises, incorporating detectors in all circulation areas that form part of the escape routes from the premises, and in all rooms and areas, other than those with negligible sources of ignition, such as toilets, bathrooms and shower rooms;*
LD2	*A system incorporating detectors in all circulation areas that form part of the escape routes from the premises, and in all specified rooms or areas that present a high fire risk to occupants, including any kitchen and the principal habitable room*
LD3	*A system incorporating detectors in all circulation areas that form part of the escape routes from the premises.*

Guidance on grade and coverage of fire detection and warning systems within various types of existing residential premises

As outlined above, when specifying a system it is necessary to follow the principles of fire risk assessment. The design and complexity of the system should reflect the risk presented by the subject property and the type of occupier.

The recommendations for system design outlined in **table 3** below are based on a broad risk assessment using data sourced from BS 5839: part 6 (2019).

The recommendations constitute an acceptable benchmark and will, in the majority of cases, provide a reasonable level of protection. However, individual characteristics of the subject property must always be considered before specifying a particular system.

The recommendations below are based on properties considered to present a normal risk for their type.

They will have a suitable level of protection to the escape route and adequate other fire precautions as recommended in this guidance.

Their occupiers will not be from high-risk groups. If this is not the case in the property under consideration then the risk can be considered as higher, and it may therefore be considered appropriate to recommend a higher standard of fire detection and warning or provide additional fire safety measures as appropriate to the case.

DETERMINING STOREY HEIGHTS :

For the purposes of fire safety, when counting the number of storeys you should count all floors from the level of the final exit to the topmost floor (include mezzanines as storeys). Where the final exit is located on the ground floor (or raised ground floor) any lower ground floor/basement/cellar should not be counted.

Therefore, a house with a basement, ground and two upper floors with its entrance/final exit at ground floor level should be counted as a three-storey house.
Note: this is a different convention to that in the HMO licensing definition (which counts cellars/basements) as this guidance is considering the distance of travel to the final exit as a factor in determining fire risk.

Table 3: Recommended grade and coverage of automatic fire detection and warning system for various categories of existing residential premises (normal risk)

Project Arrangement	BS System configuration
1. **Single household occupancy up to four storeys**	**Grade D: LD3** coverage (interlinked)
2. **Single household occupancy up to four storeys**	**Grade D: LD3** coverage (interlinked)
3. **Single household occupancy five or six storeys**	**Grade A: LD3** coverage
4. **Shared house HMO of up to two storeys (shared cooking facilities)**	**Grade D: LD3** coverage + additional detection to the kitchen, lounge and any cellar containing a risk (interlinked)
5. **Shared house HMO of up to two storeys (shared cooking facilities)**	**Grade D: LD3** coverage + additional detection to the kitchen, lounge and any cellar containing a risk (interlinked)
6. **Shared house HMO of three or four storeys (shared cooking facilities)**	**Grade D: LD3** coverage + additional detection to the kitchen, lounge and any cellar containing a risk (interlinked)
7. **Shared house HMO of five or six storeys** (shared cooking facilities)	**Grade A: LD2** coverage (detection in all risk rooms i.e. bedrooms, kitchen and lounge) (interlinked)
8. **Bedsit HMO of one or two storeys** with individual cooking facilities within bedsits	A mixed system: • **Grade D: LD2** coverage in the common areas and heat detectors in bedsits (interlinked) • **Grade D** smoke alarm in each bedsit to protect the sleeping occupants (non-interlinked)
9. **Bedsit HMO of three to six storeys** with individual cooking facilities within bedsits	A mixed system: • **Grade A: LD2** coverage in the common areas and heat detectors in bedsits (interlinked) • **Grade D** smoke alarm in each bedsit to protect the sleeping occupants (non-interlinked)
10. **Two-storey house converted to self-contained flats** (prior to Building Regulations 1991, approved document B standard)	A mixed system: • **Grade D: LD2** coverage in the common areas and a heat detector in each flat in the room/lobby opening onto the escape route (interlinked) • **Grade D: LD3** coverage in each flat (non-interlinked smoke alarm in the room/lobby opening onto the escape route) to protect the sleeping occupants
11. **Three- to six-storey house converted to self-contained flats** (prior to Building Regulations 1991, approved document B standard)	• **Grade A: LD2** coverage in the common areas and a heat detector in each flat in the room/lobby opening 26 housing – fire safety onto the escape route (interlinked) • **Grade D: LD3** coverage in each flat (non-interlinked smoke alarm in the room/lobby opening onto the escape route) to protect the sleeping occupants
12. **Building converted partly into self-contained flats** and partly into bedsits or non-self-contained lets	**A mixed system:** • Apply the appropriate recommendation for each unit of accommodation from this table and the appropriate whole-house system based on the storey height
13. **Flat in multiple occupation** (FMO) (any storey height and regardless of date of construction/conversion)	**Grade D: LD3** coverage + additional heat detector in the kitchen (and shared living room depending on risk)

TECHNICAL MEMORANDUM 023

Suspended timber floor construction general guidance

(This document offers general guidance, based upon requirements contained within Part C Approved Document – You should seek the guidance of your professional designers for all related design and construction issues)

A suspended timber floor next to the ground may be built as follows (Figure 1 below). You should during the scope of your work remove any vegetable matter from beneath the proposed building location (treating the ground and or incorporating root control / vapour control membranes. Two of the most common scenarios is detailed below. You are expected to provide thermal insulation within the floor construction (which is not shown in our details) :

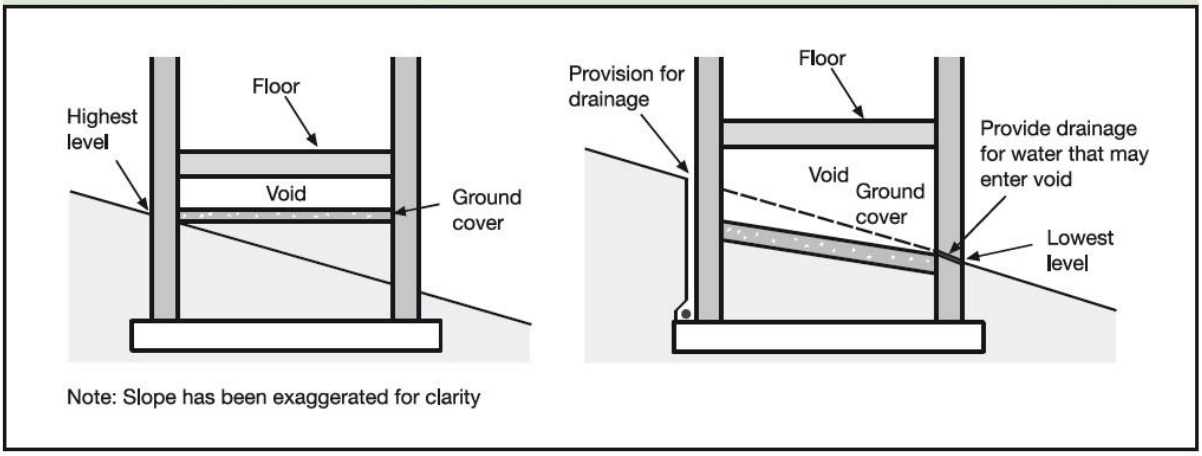
a. Ground covering either :

i. unreinforced concrete at least 100mm thick to mix ST 1 in BS 8500-1 :2002 Concrete. (Complementary British Standard to BS EN 206-1 Method of specifying and guidance for the specifier). The concrete should be laid on a compacted hardcore bed of clean, broken brick or any other inert material free from materials including water-soluble sulphates in quantities which could damage the concrete; **or**

ii. concrete, composed as described above, or inert fine aggregate, in either case at least 50mm thick laid on at least 300µm (1200 gauge) polyethylene sheet with sealed joints, and itself laid on a bed of material which will not damage the sheet.

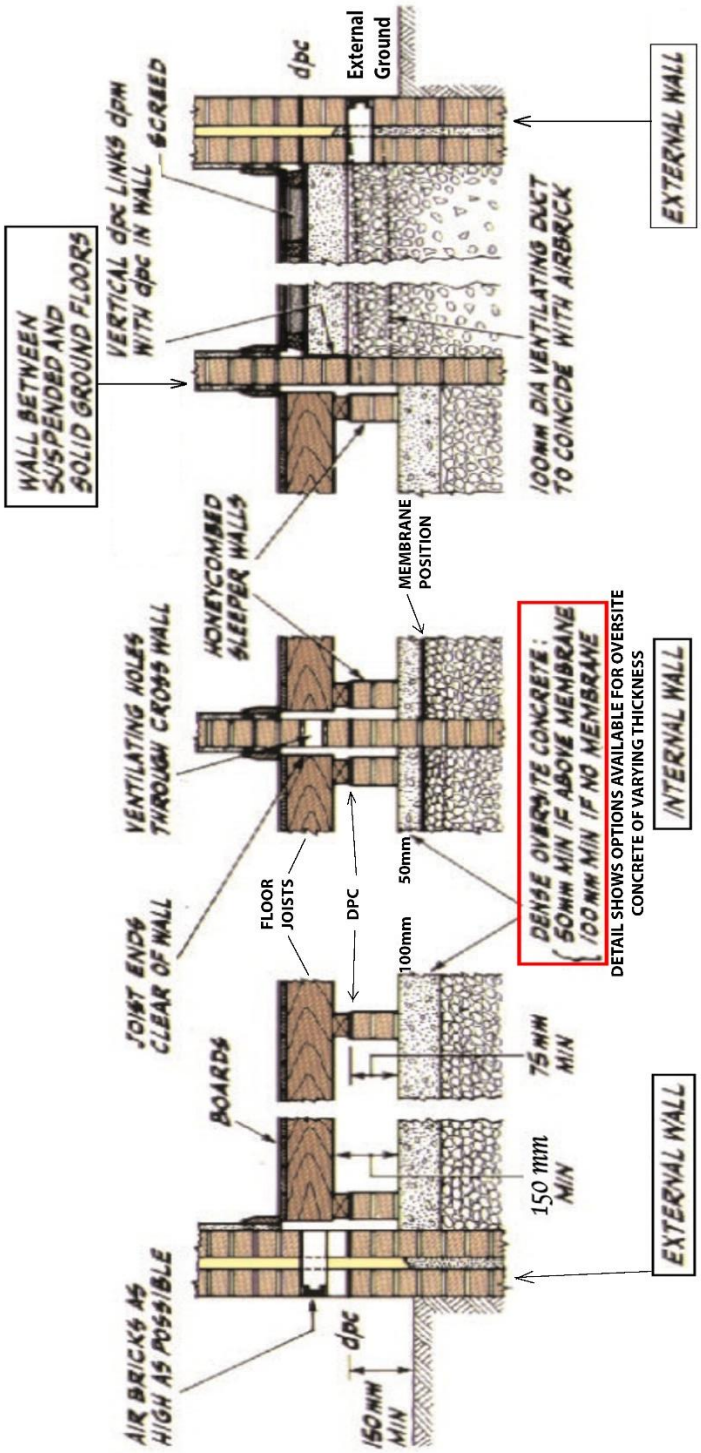
To prevent water collecting on the ground covering, either the top should be entirely above the highest level of the adjoining ground or, on sloping sites, consideration should be given to installing drainage on the outside of the up-slope side of the building (see Diagram 6).

Diagram 6 **Suspended floor – preventing water collection**



(extract image from Approved Document Part C)

b. Ventilated air space measuring at least 75mm from the ground covering to the underside of any wall-plates and at least 150mm to the underside of the suspended timber floor (or insulation if provided). Two opposing external walls should have ventilation openings placed
so that the ventilating air will have a free path between opposite sides and to all parts. The openings should be not less than either 1,500mm2/m run of external wall or 500mm2/m2 of floor area, whichever gives the greater



SECTIONAL VIEW THROUGH A TYPICAL GROUND FLOOR SUSPENDED FLOOR LAYOUT

Fig.1

TECHNICAL MEMORANDUM 024

IMPROVING YOUR ENERGY PERFORMANCE CERTIFICATE RATINGS

Consumers ready to purchase or to rent your newly built, converted or fully refurbished buildings have become more discernible and certainly more energy efficiency conscious.

Making early decisions during your building design stage to make your project more energy efficient should be undertaken in conjunction with your Architect and energy consultants.

ENERGY PERFORMANCE CERTIFICATES (EPC)

Typically shows ratings measured on a scale from A (**most efficient**) to G (**least efficient**) and is valid for 10 years.

To be clear, most EPC we see on developed properties achieve an EPC Rating of either C or D.

The EPC comprises of two main charts which I go into more detail below i.e.

a. Energy Efficiency Rating

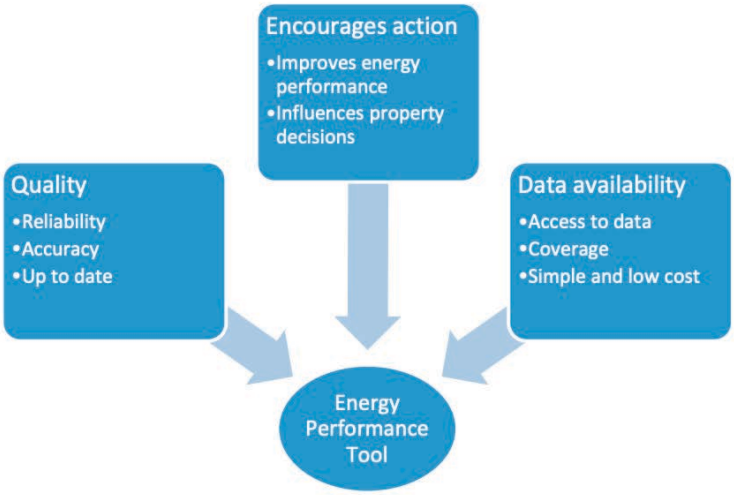
This is a rating of the overall efficiency of a home. A higher rating means the home is more efficient which in turn means lower energy bills.

b. Environmental Impact CO2 Rating

This is a measure of the properties impact on the environment in terms of carbon dioxide (CO2) emissions. The higher the rating, the less negative impact it has on the environment.

Take the time early on to carry out building work that helps to achieve a good rating.

Diagram1. Energy Performance Certificates



Keynotes

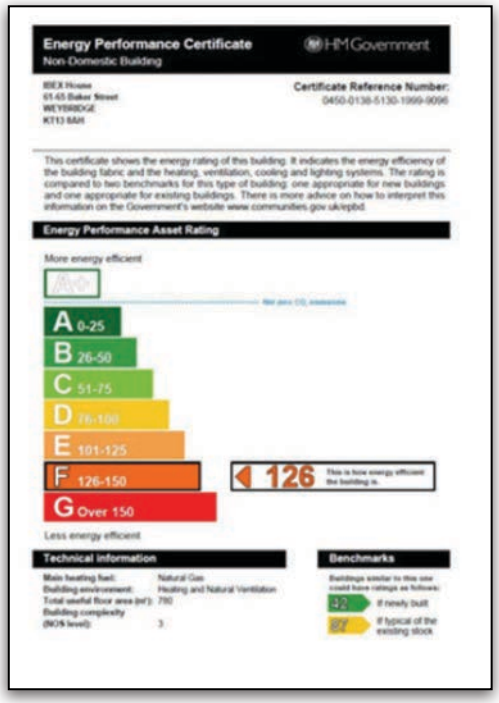
"18-20% of domestic consumers said the EPC influenced their choice of property to some extent and 6% used the information on the EPC when negotiating a purchase or rental price"[1]

"More efficient houses (rated A/B) sell for on average 14% more than equivalent properties with a G rating, and that the introduction of EPCs led to a value uplift for more efficient properties [2]

"GoCompare survey suggested that energy efficiency is becoming more important, with central heating, double glazing, a good energy efficiency rating and cavity wall insulation appearing in the top 20 desirable features of a new home" [3].

“Most surveys on what people value when deciding to buy or rent a house suggest that other factors are more important, such as location, price and condition of the building” [4]

A low rated Energy Performance Certificate (showing below E ratings) shows that you have produced a poorly performing non-energy efficient project - Not a good outcome if you are selling or renting your development !



IMPORTANT DATA THAT YOU MUST SEND TO YOUR ENERGY ASSESSOR EARLY ON DURING YOUR PROJECT

Make sure that you prepare and send to your energy assessor all specification information, the latest plans, and details of all fittings and services such as window / door information, ventilation details, space and water heating information, energy lighting information and sufficient details of the insulation fitted to roof, walls, floors.

NEW BUILD PROJECTS

The following information should be submitted to your energy assessor prior to the production of the final Energy Performance Certificate :

1. Make sure that you follow your designers recommendation to produce an air tight building. Seal holes around any pipes, hatches, and any openings through the external walls, roofs, or floors.
2. Install energy efficient services (boilers, lights, mechanical vents) and fittings (fenestration) in accordance with your specifications.
3. Install insulation which follows your designers specifications that meet building regulation minimum performance criteria.
4. Arrange for an air test of your building in consultation with your energy assessor recommendations.

CONVERTED BUILDINGS

The following information should be submitted to your energy assessor prior to the production of the final Energy Performance Certificate :

1. Evidence of any thermally upgraded walls, floors, roofs
2. Thermal performance data relating to your replacement doors and windows
3. Information of all energy efficient space or water heating installations including controls
4. Information of energy efficient lighting installed.

GENERAL EXCEPTIONAL CIRCUMSTANCES:

Please note there are circumstances where restrictions to the improvement of the thermal performance of your building development may become apparent i.e. Your building is “Listed” and its character is protected under Town and Country Planning (Conservation legislation), and or your building is in a Conservation Area. Please advise your Energy Assessor early on before your project starts to allow any recommendations to improve your Energy Rating.

1. Consumer Focus ‘Room for improvement: The impact of EPCs on consumer decision making’ 2011 page 9 and Department for Communities and Local Government ‘English Housing Survey: Homes 2011’ 2013 (viewed 31 May 2018) page 7 and Department for Communities and Local Government ‘English Housing Survey: Homes 2011’ 2013 (viewed 31 May 2018) page 104

2. Backhaus and others ‘Key findings & policy recommendations to improve effectiveness of Energy Performance Certificates & the Energy Performance of Buildings Directive’ 2011 (viewed 31 May 2018) page 23 and Consumer Focus ‘Room for improvement: The impact of EPCs on consumer decision making’ 2011 (viewed 31 May 2018) page 6

3. GoCompare ‘The 20 features that will sell your home’ 2017 (Viewed 13 June 2018)
4. Backhaus and others ‘Key findings & policy recommendations to improve effectiveness of Energy Performance Certificates & the Energy Performance of Buildings Directive’ 2011 (viewed 31 May 2018) page 23 and Consumer Focus ‘Room for improvement: The impact of EPCs on consumer decision making’ 2011 (viewed 31 May 2018) page 6