

## Requirement B1: Means of warning and escape

These sections deal with the following requirement from Part B of Schedule 1 to the Building Regulations 2010.

Requirement	
<i>Requirement</i>	<i>Limits on application</i>
<b>Means of warning and escape</b>	
<b>B1.</b> The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times.	Requirement B1 does not apply to any prison provided under section 33 of the Prison Act 1952 <sup>(a)</sup> (power to provide prisons, etc.).
	(a) 1952 c. 52; section 33 was amended by section 100 of the Criminal Justice and Public Order Act 1994 (c. 33) and by S.I. 1963/597.

### Intention

In the Secretary of State's view, requirement B1 is met by achieving all of the following.

- There are sufficient means for giving early warning of fire to people in the **building**.
- All people can escape to a place of safety without external assistance.
- Escape routes** are suitably located, sufficient in number and of adequate capacity.
- Where necessary, **escape routes** are sufficiently protected from the effects of fire and smoke.
- Escape routes** are adequately lit and exits are suitably signed.
- There are appropriate provisions to limit the ingress of smoke to the **escape routes**, or to restrict the spread of fire and remove smoke.
- For buildings containing **flats**, there are appropriate provisions to support a stay put evacuation strategy.

The extent to which any of these measures are necessary is dependent on the use of the **building**, its size and its **height**.

Building work and material changes of use subject to requirement B1 include both new and existing **buildings**.

# Section 1: Fire detection and alarm systems

## General provisions

- 1.1 All **dwelling**s should have a fire detection and alarm system, minimum Grade D2 Category LD3 standard, in accordance with the relevant recommendations of **BS 5839-6**.

A higher standard of protection should be considered where occupants of a proposed **dwelling** would be at special risk from fire. Further advice on this is also given in **BS 5839-6**.

- 1.2 Smoke alarms should be mains operated and conform to **BS EN 14604**.

- 1.3 Heat alarms should be mains operated and conform to **BS 5446-2**.

- 1.4 Smoke and heat alarms should have a standby power supply, such as a battery (rechargeable or non-rechargeable) or capacitor. More information on power supplies is given in clause 15 of **BS 5839-6**.

**NOTE:** The term 'fire alarm system' describes the combination of components for giving an audible and/or other perceptible warning of fire.

**NOTE:** In this document, the term 'fire detection system' describes any type of automatic sensor network and associated control and indicating equipment. Sensors may be sensitive to smoke, heat, gaseous combustion products or radiation. Automatic sprinkler systems can also be used to operate a fire alarm system.

## Large dwellinghouses

- 1.5 A large **dwellinghouse** has more than one **storey**, and at least one **storey** exceeds 200m<sup>2</sup>.

- 1.6 A large **dwellinghouse** of two **storeys** (excluding **basement storeys**) should be fitted with a Grade A Category LD3 fire detection and alarm system, as described in **BS 5839-6**.

- 1.7 A large **dwellinghouse** of three or more **storeys** (excluding **basement storeys**) should be fitted with a Grade A Category LD2 fire detection and alarm system as described in **BS 5839-6**.

## Extensions and material alterations

- 1.8 A fire detection and alarm system should be installed where either of the following applies.

- A new **habitable room** is provided above or below the ground **storey**.
- A new **habitable room** is provided at the ground **storey**, without a **final exit**.

- 1.9 Smoke alarms should be provided in the **circulation spaces** of the **dwelling** in accordance with paragraphs 1.1 to 1.4.

## Blocks of flats

**1.10** Each flat in a block should have alarms as set out in paragraphs 1.1 to 1.4. With effective compartmentation, a communal fire alarm system is not normally needed. In some buildings, detectors in common parts of the building may need to operate smoke control or other fire protection systems but do not usually sound an audible warning.

## Student accommodation

**1.11** In student residences that are designed and occupied as a block of flats, separate automatic detection should be provided in each self-contained flat where all of the following apply.

- a. A group of up to six students shares the flat.
- b. Each flat has its own entrance door.
- c. The compartmentation principles for flats in Section 7 have been followed.

Where a total evacuation strategy is adopted, the alarm system should follow the guidance for buildings other than dwellings in Volume 2 of Approved Document B.

## Sheltered housing

**1.12** The fire detection and alarm systems in flats should connect to a central monitoring point or alarm receiving centre. The systems should alert the warden or supervisor and identify the individual flat where a fire has been detected.

**1.13** These provisions do not apply to the following.

- a. The common parts of a sheltered housing development, such as communal lounges.
- b. Sheltered accommodation in the 'residential (institutional)' or 'residential (other)' purpose groups (purpose group 2(a) or 2(b)).

In these parts, means of warning should follow the guidance for buildings other than dwellings in Volume 2 of Approved Document B.

## Design and installation of systems

**1.14** Fire detection and alarm systems must be properly designed, installed and maintained. A design, installation and commissioning certificate should be provided for fire detection and alarm systems. Third party certification schemes for fire protection products and related services are an effective means of providing assurances of quality, reliability and safety.

## Interface between fire detection and alarm systems and other systems

**1.15** Fire detection and alarm systems sometimes trigger other systems. The interface between systems must be reliable. Particular care should be taken if the interface is facilitated via another system. Where any part of **BS 7273** applies to the triggering of other systems, the recommendations of that part of **BS 7273** should be followed.

## Section 2: Means of escape – dwellinghouses

### Escape from the ground storey

- 2.1 See Diagram 2.1a. All **habitable rooms** (excluding kitchens) should have either of the following.
- An opening directly onto a hall leading to a **final exit**.
  - An emergency escape window or door, as described in paragraph 2.10.

### Escape from upper storeys a maximum of 4.5m above ground level

- 2.2 See Diagram 2.1b. Where served by only one stair, all **habitable rooms** (excluding kitchens) should have either of the following.
- An emergency escape window or external door, as described in paragraph 2.10.
  - Direct access to a **protected stairway**, as described in paragraph 2.5a.
- 2.3 Two **rooms** may be served by a single window. A door between the **rooms** should provide access to the window without passing through the stair enclosure. Both **rooms** should have their own access to the internal stair.

### Escape from upper storeys more than 4.5m above ground level

- 2.4 **Dwellinghouses** with one internal stair should comply with paragraphs 2.5 and 2.6. In **dwellinghouses** with more than one stair, the stairs should provide effective alternative **means of escape**. The stairs should be physically separated by either of the following.
- Fire resisting** construction (minimum REI 30).
  - More than one **room**.

### Dwellinghouses with one storey more than 4.5m above ground level

- 2.5 See Diagram 2.1c. The **dwellinghouse** should have either of the following.
- Protected stairway** – a stair separated by **fire resisting** construction (minimum REI 30) at all **storeys**, that complies with one of the following.
    - Extends to a **final exit** (Diagram 2.2a).
    - Gives access to a minimum of two ground level **final exits** that are separated from each other by **fire resisting** construction (minimum REI 30) and **fire doorsets** (minimum E 20) (Diagram 2.2b).

**Cavity barriers** or a **fire resisting ceiling** (minimum EI 30) should be provided above a **protected stairway** enclosure (Diagram 2.3).

- b. **Alternative escape route** – a top storey separated from lower storeys by fire resisting construction (minimum REI 30) and with an alternative escape route leading to its own final exit.

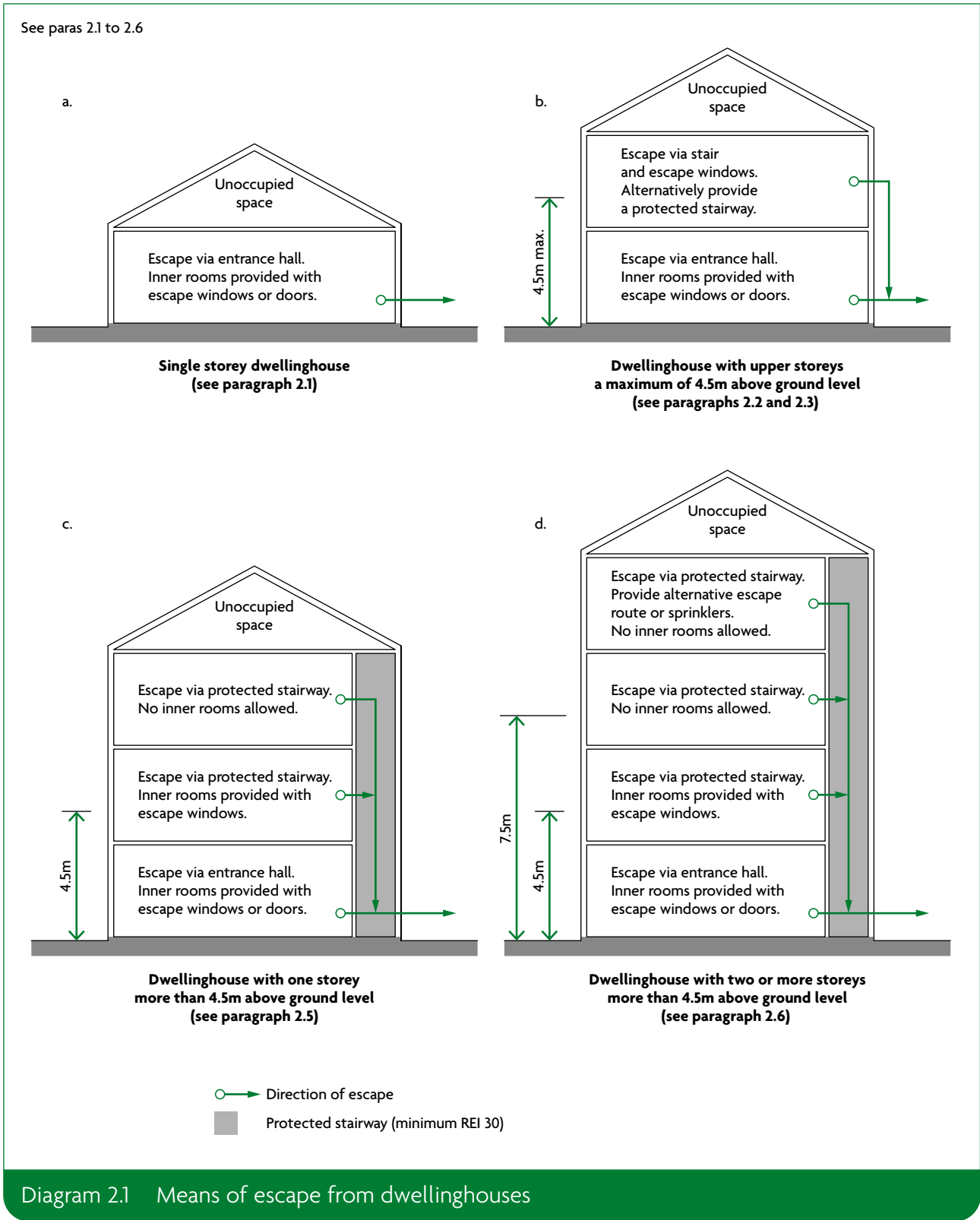
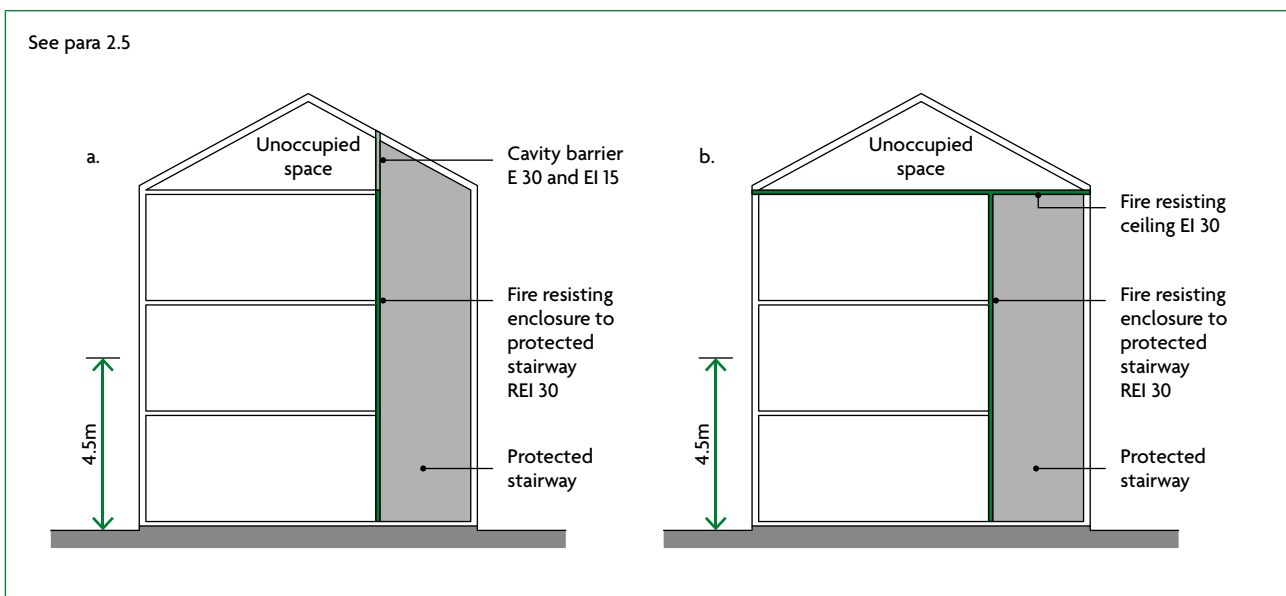
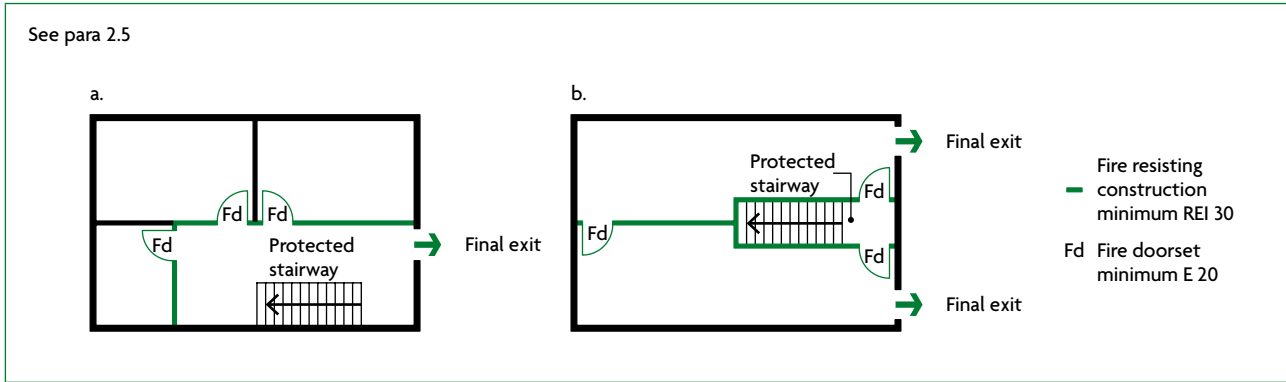


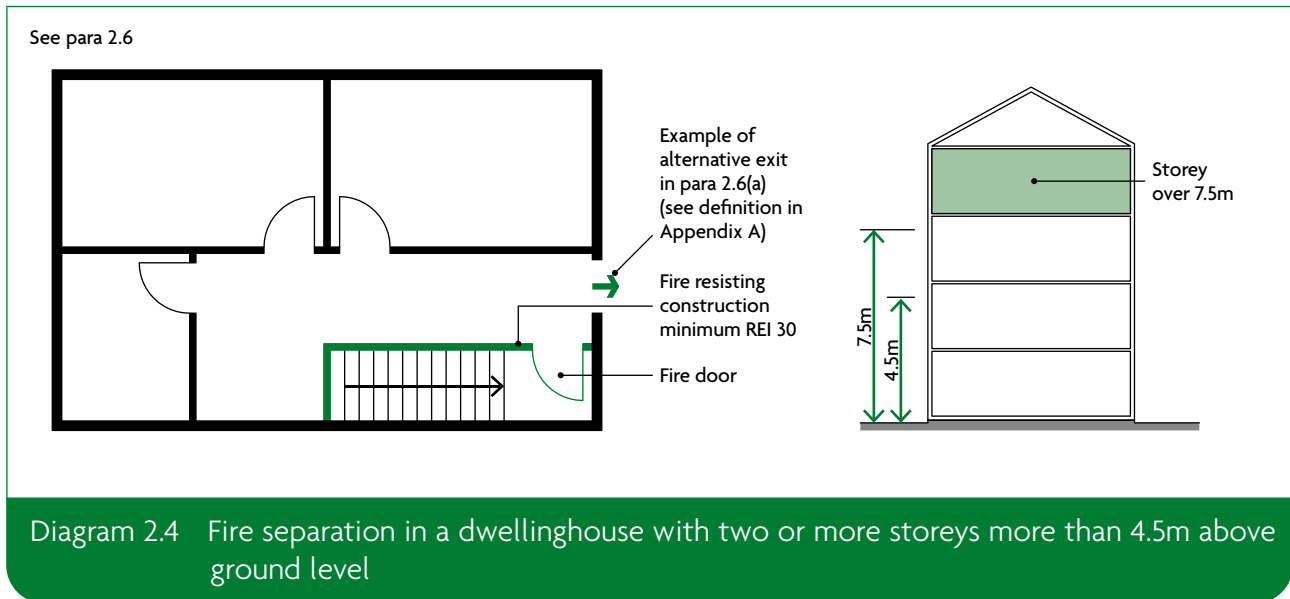
Diagram 2.1 Means of escape from dwellings



### Dwellinghouses with two or more storeys more than 4.5m above ground level

2.6 See Diagram 2.1d. In addition to meeting the provisions in paragraph 2.5, the dwellinghouse should comply with either of the following.

- a. Provide an alternative escape route from each storey more than 7.5m above ground level. At the first storey above 7.5m, the protected stairway should be separated from the lower storeys by fire resisting construction (minimum REI 30) if the alternative escape route is accessed via either of the following.
  - i. The protected stairway to an upper storey.
  - ii. A landing within the protected stairway enclosure to an alternative escape route on the same storey. The protected stairway at or about 7.5m above ground level should be separated from the lower storeys or levels by fire resisting construction (see Diagram 2.4).
- b. Provide a sprinkler system throughout, designed and installed in accordance with BS 9251.



## Passenger lifts

**2.7** A passenger lift serving any **storey** more than 4.5m above ground level should be in either of the following.

- The enclosure to the **protected stairway**, as described in paragraph 2.5.
- A **fire resisting** lift shaft (minimum REI 30).

## Air circulation systems

**2.8** Air circulation systems which circulate air within an individual **dwellinghouse** with a floor more than 4.5m above ground level should meet the guidance given in paragraph 2.9.

**2.9** All of the following precautions should be taken to avoid the spread of smoke and fire to the **protected stairway**.

- Transfer grilles should not be fitted in any wall, door, floor or **ceiling** of the stair enclosure.
- Any duct passing through the stair enclosure should be rigid steel. Joints between the ductwork and stair enclosure should be **fire-stopped**.
- Ventilation ducts supplying or extracting air directly to or from a **protected stairway** should not serve other areas as well.
- Any system of mechanical ventilation which recirculates air and which serves both the stair and other areas should be designed to shut down on the detection of smoke within the system.
- For ducted warm air heating systems, a room thermostat should be sited in the living **room**. It should be mounted at a height between 1370mm and 1830mm above the floor. The maximum setting should be 27°C.

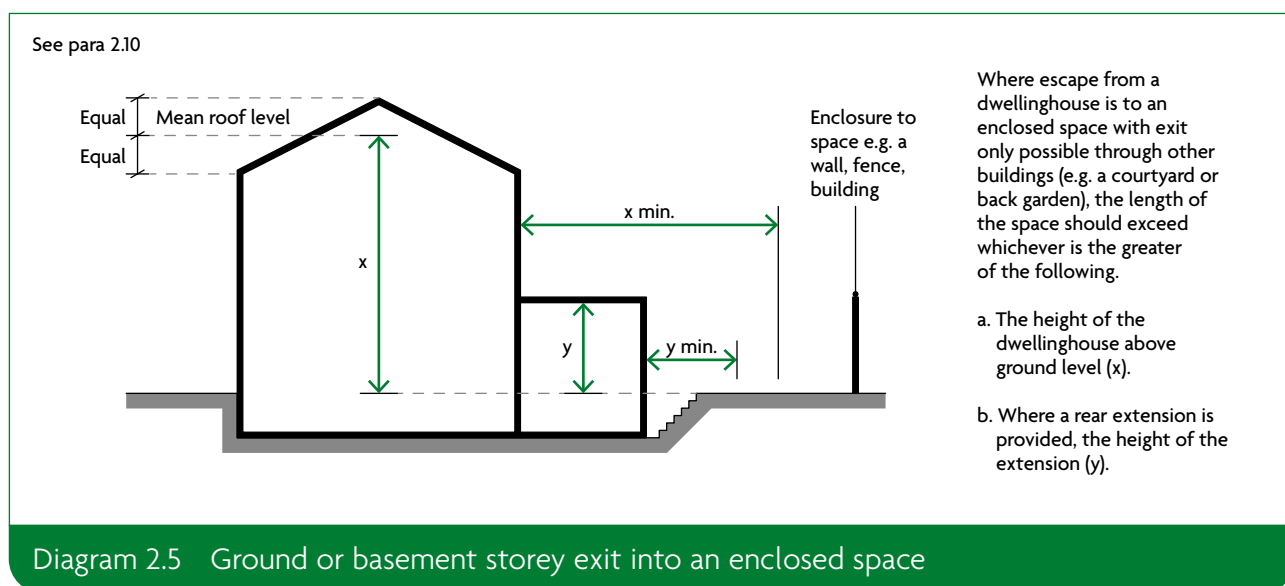
**NOTE:** Ventilation ducts passing through **compartment walls** should comply with the guidance in Section 9.

## General provisions

### Emergency escape windows and external doors

**2.10** Windows or external doors providing emergency escape should comply with all of the following.

- a. Windows should have an unobstructed openable area that complies with all of the following.
  - i. A minimum area of 0.33m<sup>2</sup>.
  - ii. A minimum height of 450mm and a minimum width of 450mm (the route through the window may be at an angle rather than straight through).
  - iii. The bottom of the openable area is a maximum of 1100mm above the floor.
- b. People escaping should be able to reach a place free from danger from fire. Courtyards or inaccessible back gardens should comply with Diagram 2.5.
- c. Locks (with or without removable keys) and opening stays (with child-resistant release catches) may be fitted to escape windows.
- d. Windows should be capable of remaining open without being held.



### Inner rooms

**2.11** An inner room is permitted when it is one of the following.

- a. A kitchen.
- b. A laundry or utility room.
- c. A dressing room.
- d. A bathroom, WC or shower room.
- e. Any room on a storey that is a maximum of 4.5m above ground level which is provided with an emergency escape window as described in paragraph 2.10.
- f. A gallery that complies with paragraph 2.15.



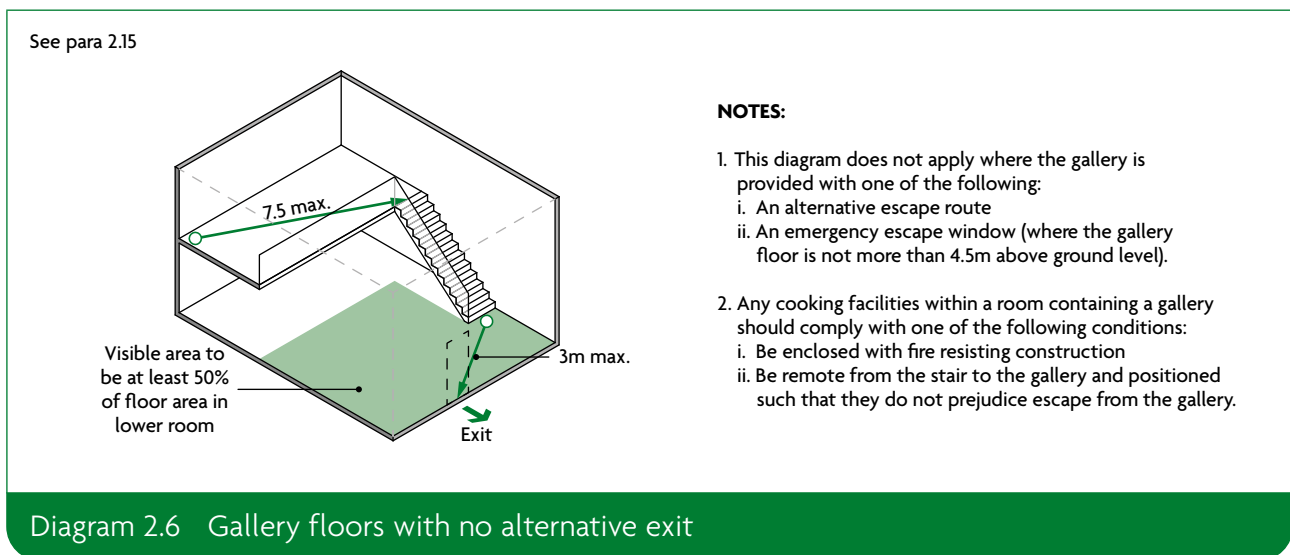
- 2.12** A room accessed only via an inner room (an inner inner room) is acceptable when all of the following apply.
- It complies with paragraph 2.11.
  - The access rooms each have a smoke alarm (see Section 1).
  - None of the access rooms is a kitchen.

## Balconies and flat roofs

- 2.13** Where a flat roof forms part of a means of escape, it should comply with all of the following.
- It should be part of the same building from which escape is being made.
  - The route across the roof should lead to a storey exit or external escape route.
  - The part of the roof (including its supporting structure) forming the escape route, and any opening within 3m of the escape route, should be of fire resisting construction (minimum REI 30).
- 2.14** A balcony or flat roof intended to form part of an escape route should be provided with guarding etc. in accordance with Approved Document K.

## Galleries

- 2.15** A gallery should comply with one of the following.
- It should be provided with an alternative exit.
  - It should be provided with an emergency escape window, as described in paragraph 2.10, where the gallery floor is a maximum of 4.5m above ground level.
  - It should meet all the conditions shown in Diagram 2.6.



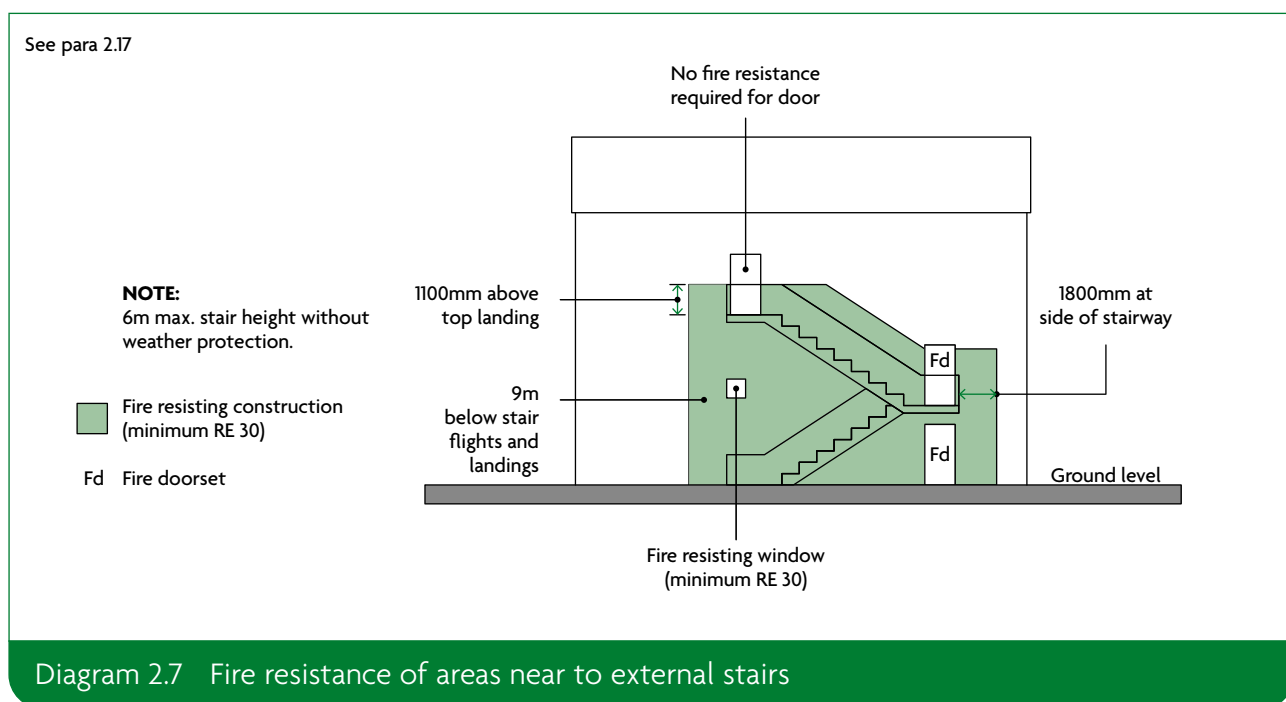
## Basements

- 2.16** Basement storeys containing habitable rooms should have one of the following.
- An emergency escape window or external door providing escape from the basement (paragraph 2.10).
  - A protected stairway (paragraph 2.5a) leading from the basement to a final exit.

## External escape stairs

2.17 Any external escape stair should meet all of the following conditions (Diagram 2.7).

- a. Doors to the stair should be **fire resisting** (minimum E 30), except for a single exit door from the **building** to the top landing of a downward-leading external stair.
- b. **Fire resisting** construction (minimum RE 30) is required for the **building** envelope within the following zones, measured from the flights and landings of the external stair.
  - i. 1800mm horizontally.
  - ii. 9m vertically below.
  - iii. 1100mm above the top landing of the stair (except where the stair leads from basement to ground level).
- c. **Fire resisting** construction (minimum RE 30) should be provided for any part of the **building** (including doors) within 1800mm of the **escape route** from the foot of the stair to a place of safety. This does not apply if there are **alternative escape routes** from the foot of the external escape stair.
- d. Stairs more than 6m in **height** should be protected from adverse weather. Protection should prevent the build-up of snow or ice but does not require full enclosure.
- e. Glazing in areas of **fire resisting** construction should be fixed shut and **fire resisting** (in terms of integrity, but not insulation) (minimum E 30).



## Work on existing dwellinghouses

### Replacement windows

- 2.18** Work should comply with Parts K and L of Schedule 1 to the Building Regulations. When complete, the **building** should comply with other applicable parts of Schedule 1 to at least the same level as before.
- 2.19** Where an existing window would be an escape window in a new **dwellinghouse**, and is big enough to be used for escape purposes, then the replacement should comply with one of the following.
- The replacement window should be sized to provide at least the same potential for escape.
  - If the existing window was larger than required for escape purposes, the opening can be reduced to the minimum described in paragraph 2.10.
- 2.20** If windows are replaced, it may be necessary to provide **cavity barriers** around the opening in accordance with Section 5.

### Loft conversions

- 2.21** 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.
- NOTE:** Where the layout is open plan, new partitions should be provided to enclose the **escape route** (Diagram 2.2).
- 2.22** 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.
- 2.23** An alternative approach to that described in paragraph 2.21 would be to comply with all of the following.
- Provide sprinkler protection to the open-plan areas.
  - 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 window.
  - Separate cooking facilities from the open-plan area with **fire resisting** construction (minimum REI 30).