

Active Fire Precautions

When and Where are they needed?

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- Automatic Fire Detection
- Emergency lighting
- Water Suppression systems
- Fire Curtains

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Automatic Fire Detection

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- General requirements of a system
- Main types of Detector
- The different grades of system available
- The appropriate system for different types of building



The main Automatic Detection methods

Optical - infrared light to detect smoke particles
Good for circulation spaces and smouldering fire - ie furniture /bedding. Also less sensitive to quick burning kitchen fires

Ionisation - tiny source of radiation to detect smoke
Good for fast burning fires ie living rooms dining rooms

**Heat
Aspirating
Flame**

10.1.2 Smoke Detectors

Two classes of smoke detector are commonly used:

- a) ionization chambers smoke detectors, which operate on the principle that the electrical current flowing between electrodes in an ionization chamber is reduced when smoke particles enter the chamber;
- b) optical smoke detectors, which operate by detecting the scattering or absorption of light by smoke particles.





10 Types of fire detector and their selection

10.1 Commentary

10.1.1 General

Fire detectors are designed to detect one or more of four characteristics of a fire, namely smoke, heat, combustion gas (normally carbon monoxide) and flame. These characteristics can be detected in various ways. No single type of detector is the most suitable for all applications and the final choice on individual circumstances. Particularly in the case of Category LD2 and LD1 systems, it can be appropriate to use a mixture of types of detector.

All fire detectors will respond to some extent to phenomena other than fire. Recommendations for reducing the incidence of such false alarms are given in Clause 12.



Domestic guidance

BS9991, ADB vol. 1 and BS5839 part 6

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BS 5839-6:2019



BSI Standards Publication

Fire detection and fire alarm systems for buildings

Part 6: Code of practice for the design, installation,
commissioning and maintenance of fire detection and fire
alarm systems in domestic premises

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Domestic system grades and level of coverage

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The grades are defined as follows.

- *Grade A: A fire detection and fire alarm system, which incorporates CIE conforming to BS EN 54-2 and power supply equipment conforming to BS EN 54-4, and which is designed and installed in accordance with all the recommendations of BS 5839-1:2017, Section 1 to Section 4 inclusive, except those in the following clauses, for which the corresponding clauses of this part of BS 5839 need to be substituted.*

<i>Clause/subclause of BS 5839-1:2017</i>	<i>Corresponding clause/subclause of BS 5839-6</i>
16 (Audible alarm signals)	13 (Audible fire alarm devices and audibility)
18 (Fire alarm warnings for people who are Deaf and hard of hearing)	14 (Fire alarm warnings for people who are Deaf and hard of hearing)
20 (Manual call points)	18 (Manual call points)
25.4e (Capacity of standby batteries)	15.2c (Capacity of standby batteries)
27 (Radio-linked systems)	21 (Radio-linked systems)



- *Grade B: Not currently defined.*
- *Grade C: A system of fire detectors and alarm sounders (which may be combined in the form of smoke alarms) connected to a common power supply, comprising the normal mains and a standby supply, with central control equipment.*
- *Grade D1: A system of one or more mains-powered detectors (see [3.12](#)), each with a tamper-proof standby supply consisting of a battery or batteries (see [3.62](#)).*
- *Grade D2: A system of one or more mains-powered detectors (see [3.12](#)), each with an integral standby supply consisting of a user-replaceable battery or batteries.*
- *Grade E: Not currently defined.*
- *Grade F1: A system of one or more battery-powered detectors (see [3.12](#)) powered by a tamper-proof primary battery or batteries (see [3.62](#)).*
- *Grade F2: A system of one or more battery-powered detectors (see [3.12](#)) powered by a user-replaceable primary battery or batteries.*



8.1.2 Systems for the protection of life (Category LD)

All domestic premises need to be provided with an appropriate fire detection and fire alarm system. The greatest benefit to life safety is given by a full-coverage system (Category LD1). Such a system will give the earliest practicable warning of fire to occupants, wherever ignition occurs.

However, a good level of protection can normally be obtained from a Category LD2 system, in which detection is only provided at points where the fire risk is high or where combustion products would present a significant hazard to life. A Category LD2 system might, for instance, have detectors only in the circulation areas of premises, the living room and the kitchen; other areas might be left without detector coverage. The areas protected by a Category LD2 system include escape routes, i.e. those areas that would be protected by a Category LD3 system.



A Category LD3 system is intended only to protect circulation areas that would be used as escape routes, by giving a warning if smoke is detected in these areas, so that occupants can escape before heat or smoke make this impossible. A Category LD3 system cannot be expected, with any degree of reliability, to protect people who might be involved with the fire at ignition or in its early stages. This Category of system might not therefore prevent the death or serious injury of occupants in the room where the fire originates; it is intended only to ensure escape for those not immediately involved. If no detector is installed in the room in which fire starts, the time available for evacuation of other areas once fire is detected in the circulation area might be quite short. In a large family house adapted to provide

What's the appropriate system for my building?



- Consider - Life Safety and Property Protection requirements?
- Consider Clients requirements, Insurers requirements and Building Regulation life safety provisions
- Refer to guidance (BS5839 part 6 domestic or BS5839 Part 1 commercial)
- Commercial also refer to BS9999 - Risk profile helps to refine choice of system



Generally which would be the most appropriate system for Building Regulations in the following scenarios. eg Residential LD1, LD2 or LD3. Commercial- Type M, L1, L2, L3, L4 or L5?

	System type
An office building multi storey with potential lone working on the upper floors	
A residential care home 10 bedroom	
A 2 storey medium sized shop/ retail unit	
An Assembly building ie Theatre or Events Venue operating near peak physical evacuation capacity.	
Flats above a shop where compartmentation is good	
A hotel multi storey	



Residential

Loft conversions
Within apartments Stay put policy?
Within duplexes
Common areas
HIMO's

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Automatic Fire Detection BS5839-6



Table 1 — Minimum grade and category of fire detection and fire alarm system for protection of life in typical premises

Class of premises	Minimum grade and category of system for installation in:			
	New or materially altered premises		Existing premises	
	Grade	Category	Grade	Category
Single-family dwellings ^{A)} and shared houses ^{B)} with no floor greater than 200 m² in area				
Owner-occupied ^{C)} bungalow, flat or other single-storey unit	D2	LD2 ^{D)}	F2 ^{E), F), G)}	LD3 ^{F), G), H)}
Rented bungalow, flat or other single-storey unit	D1	LD2 ^{D)}	D1	LD2 ^{D)}
Owner-occupied ^{C)} maisonette with no floor above 4.5 m from ground level or owner-occupied two-storey house	D2	LD2 ^{D)}	F2 ^{E), F), G)}	LD3 ^{F), G), H)}
Rented maisonette with no floor above 4.5 m from ground level or rented two-storey house	D1	LD2 ^{D)}	D1	LD2 ^{D)}
Rented maisonette with any floor above 4.5 m from ground level and with alternative means of escape	D1	LD2 ^{D)}	D1	LD2 ^{D)}
Any maisonette with any floor above 4.5 m from ground level and no alternative means of escape	D1	LD1	D1	LD1
Owner-occupied ^{C)} three-storey house	D2	LD2 ^{D)}	F2 ^{E), F), G)}	LD2 ^{D)}
Rented three-storey house	D1	LD2 ^{D)}	D1	LD2 ^{D)}
Owner-occupied ^{C)} four- (or more) storey house	A	LD2 ^{D)}	D2 ^{I)}	LD2 ^{D)}
Rented four- (or more) storey house	A	LD1 ^{I)}	D1	LD1 ^{I)}

Automatic Fire Detection BS5839-6



Single-family dwellings ^{A)} and shared houses ^{B)} with one or more floors greater than 200 m ² in area				
Owner-occupied ^{C)} bungalow, flat or other single-storey unit	D2	LD2 ^{D)}	D2 ^{I)}	LD3 ^{F), G), H)}
Rented bungalow, flat or other single-storey unit	D1	LD2 ^{D)}	D1	LD2 ^{D)}
Owner-occupied ^{C)} maisonette with no floor above 4.5 m from ground level or owner-occupied two-storey house	A	LD2 ^{D)}	D2 ^{I)}	LD3 ^{F), G), H)}
Rented maisonette with no floor above 4.5 m from ground level or rented two-storey house	A	LD2 ^{D)}	D1	LD2 ^{D)}
Rented maisonette with any floor above 4.5 m from ground level and with alternative means of escape	A	LD2 ^{D)}	D1	LD2 ^{D)}
Any maisonette with any floor above 4.5 m from ground level and no alternative means of escape	A	LD1	D1	LD1
Owner-occupied ^{C)} three-storey house	A	LD2 ^{D)}	D2 ^{I)}	LD2 ^{D)}
Rented three-storey house	A	LD2 ^{D)}	D1	LD2 ^{D)}
Owner-occupied ^{C)} four- (or more) storey house	A	LD2 ^{D)}	A	LD2 ^{D)}
Rented four- (or more) storey house	A	LD1 ^{I)}	A	LD1 ^{I)}

Automatic Fire Detection BS5839-6



Table 1 (continued)

Class of premises	Minimum grade and category of system for installation in:			
	New or materially altered premises		Existing premises	
	Grade	Category	Grade	Category
Houses in multiple occupation ^{K), L)} (HMOs)				
HMOs of one or two storeys with no floor greater than 200 m ² in area	D1	LD1 ^{J)}	D1	LD2 ^{D)}
Other HMOs:				
Individual dwelling units, within the HMO, comprising a single room, which include cooking facilities (bedsits)	D1 ^{M)}	LD1 ^{J), N)}	D1 ^{M)}	LD1 ^{J), N)}
Individual dwelling units, within the HMO, comprising a single room, which do not include cooking facilities (bedsits)	D1 ^{M)}	LD1 ^{J)}	D1 ^{M)}	LD1 ^{J)}
Individual dwelling units, within the HMO, comprising two or more rooms	D1 ^{M)}	LD2 ^{D)}	D1 ^{M)}	LD2 ^{D)}
Communal areas of the HMO	Grade A, Category LD2, with detectors sited in accordance with the recommendations of BS 5839-1:2017 for a Category L2 system ^{O)}			
Sheltered housing ^{P)}				
Individual dwelling units	D2	LD1 ^{J)}	D2	LD2 ^{Q)}
Communal areas	Grade A in accordance with the recommendations of BS 5839-1:2017 for a Category L4 or L5 system ^{R)}			

Automatic Fire Detection BS5839-6



Self-catering premises or premises with short-term paying guests	D1	LD1 ^{D)}	D1	LD1 ^{D)}
Supported housing				
Single-storey	D1	LD1 ^{D)}	D1	LD1 ^{D)}
Two or more storeys and not more than four bedrooms	D1	LD1 ^{D)}	D1	LD1 ^{D)}
Two or more storeys and more than four bedrooms	A	LD1 ^{D)}	A	LD1 ^{D)}

^{A)} Including premises with long-term lodgers, but not boarding houses, the latter of which are outside the scope of this part of BS 5839.

^{B)} Houses shared by no more than six persons, generally living in a similar manner to a single family (e.g. houses rented by a number of students).

^{C)} Including premises in which lodgers live as their principal home.

^{D)} Heat detectors should be installed in every kitchen. A smoke detector should be installed in the principal habitable room (see [3.47](#)). Where more than one room might be used as the principal habitable room, a smoke detector should be installed in each of these rooms. The detector in the principal habitable room (but not the kitchen) may alternatively be a carbon monoxide fire detector. However, consideration needs to be given to the potential for false alarms from a smoke detector in the lounge if a kitchen opens directly into, or is combined with, the lounge.

^{E)} A Grade F1 system should be installed if there is any doubt regarding the long-term suitability or reliability of a battery-powered system, i.e. the ability to replace batteries.

^{F)} Where electrical work such as a rewire is undertaken, a Grade D (D1 or D2), Category LD2 system should be installed.

Automatic Fire Detection – Mixed grade example



figure D8: bedsit-type HMO, three or four storeys

AFD mixed system Grade A, LD2 and grade D – see 22

Simple multi-purpose fire extinguisher in common parts on each floor

Emergency escape lighting in escape route if complex/dark

Fire exit sign indicates way out

Fire alarm panel on inside wall adjacent to exit door



Sound, traditional construction between units

Additional grade D non-interlinked smoke detector in bedsits with cooking facilities

30 minute fire resisting construction throughout escape route

Fire blanket in rooms with cooking facilities

30 minute FD30S fire doors to all risk rooms



Commercial system grades and level of coverage

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Commercial

Phased Evacuation?
Total Evacuation?
Mixed use buildings

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BS 5839-1:2017
Incorporating Corrigendum No.1



BSI Standards Publication

Fire detection and fire alarm systems for buildings

Part 1: Code of practice for design, installation, commissioning
and maintenance of systems in non-domestic premises

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Table A.1 — *Choice of appropriate category of a fire detection and fire alarm system*

Type of premises	Typical category of system	Comments
Common places of work, such as offices, shops, factories, warehouses and restaurants	M or P2/M A or P1/M	Category M system normally satisfies the requirements of legislation. It is, however, often combined with a Category P system to satisfy the requirements of insurers, as company policy for protection of assets, or to protect against business interruption.
Hotels, hostels, student accommodation, houses in multiple occupation and similar premises with sleeping accommodation	L1 or L2	In bedroom areas, the design requirements are usually based on the recommendations for a Category L3 system. Detectors are, however, typically installed in most other rooms and areas, as a fire in almost any area of the building could pose a threat to sleeping occupants; the system category is, therefore, at least L2. In practice, few, if any, areas are left unprotected and the system category is effectively L1, except that a variation from the recommendations applicable to a Category L1 system might apply to the siting of heat, smoke or carbon monoxide detectors in bedrooms; this often follows the recommendations of 22.3e) for detectors in a Category L3 system.



Large public houses (No residential accommodation)	M	–
Public houses with residential accommodation	L2	–
Schools, other than small single-storey schools with less than 160 pupils	M or M/P2 or M/P2/L4 or M/P2/L5	System category is normally based on a fire risk assessment. In many schools, a Category P system is installed to combat the hazard of arson. In schools that are partly occupied at certain times (e.g. during evening classes or community use), a Category L4 or L5 system is sometimes considered appropriate.
Hospitals	L1 (with possible minor variations)	Detailed guidance on areas to be protected and possible variations is given in HTM 05-03 Part B [N1] (in England and Wales) or SHTM 82 [N26] (in Scotland).



Table A.1 (continued)

Type of premises	Typical category of system	Comments
Places of assembly, (e.g. cinemas, theatres, nightclubs, exhibition halls, museums and galleries, leisure centres and casinos):		
Small premises (e.g. accommodating less than 300 persons)	M	–
Other premises	L1 to L4	L1 systems are often provided in large or complex buildings.
Transportation terminals	M/L5	–
Covered shopping centres	L1 to L3	The exact design needs to be “tailor made” and often forms part of a fire engineering solution.
Residential care premises	L1 to L3	L1 is regarded as appropriate for large premises.
Prisons	M/L5	–
Phased evacuation buildings	L3	–
Buildings in which other fire precautions, such as means of escape, depart from recognized guidance	M/L5	Automatic fire detectors are sited in such a way as to compensate for the lower standard in other fire precautions.



Buildings with “inner rooms”, from which escape is possible only by passing through another (“access”) room, where there is inadequate vision between the inner room and the access room	M/L5	Smoke detectors are sited in the access room.
Buildings in which automatic fire detection is required to operate other fire protection systems (e.g. magnetic door holders)	M/L5	Care is necessary to ensure that automatic fire detectors are sited such that cool smoke cannot pass below the level of the detectors that cause release of the magnetic door holders, and through the (still open) doors.
Situations in which fire could readily spread from an unoccupied area and prejudice means of escape from occupied areas	M/L4 or M/L5	Custom and practice does not involve siting automatic fire detectors in all unoccupied areas, such as plant rooms and storage areas.
Any building in which automatic fire detection is provided as a requirement of a property insurer or to attract an insurance premium discount	M/P1 or M/P2	–

Risk Profiles – BS9999



Table 4 Risk profiles

Occupancy characteristic (from Table 2)	Fire growth rate (from Table 3)	Risk profile
A (Occupants who are awake and familiar with the building)	1 Slow	A1
	2 Medium	A2
	3 Fast	A3
	4 Ultra-fast	A4 ^{A)}
B (Occupants who are awake and unfamiliar with the building)	1 Slow	B1
	2 Medium	B2
	3 Fast	B3
	4 Ultra-fast	B4 ^{A)}
C (Occupants who are likely to be asleep)	1 Slow	C1 ^{B)}
	2 Medium	C2 ^{B)}
	3 Fast	C3 ^{B), C)}
	4 Ultra-fast	C4 ^{A), B)}

Automatic Fire Detection – BS9999



Table 7 Minimum level of fire detection and fire alarm system for premises

Risk profile	Minimum acceptable detection and alarm system
A1	M
A2	M
A3	L2
A4 ^{A)}	Not applicable ^{A)}
B1 ^{B)}	M
B2 ^{B)}	M
B3 ^{B)}	L2
B4 ^{A)}	Not applicable ^{A)}
Ci1	Automatic fire detection in individual units
Ci2	Automatic fire detection in individual units
Ci3 ^{A)}	L3
Cii1	L2
Cii2	L2
Cii3 ^{A)}	L1
Ciii1	L1
Ciii2	L1
Ciii3 ^{A)}	L1
C4 ^{A)}	Not applicable ^{A)}

NOTE Type M, L3, L2 and L1 systems are defined in BS 5839-1:2013.

^{A)} See Table 4.

^{B)} In some circumstances where people are in an unfamiliar building the provision of a voice and/or visual alarm system can help reduce evacuation time (see 18.2).

Automatic Fire Detection selection



Table E.2 — Example fire risks

Fire phenomenon	Example fire(s)	Ionization detection	Optical (scatter) detection	CO detection	Heat detection	Flame detection	Typical multi-sensor detection e.g. optical-heat ^A	Typical multi-sensor detection e.g. optical-heat-CO ^A
Smouldering white smoke	Smouldering electrical fire	**	*****	*	*	*	*****	*****
	Smouldering wood	***	*****	****	*	*	*****	*****
Smouldering dark smoke	Smouldering furnishings	**	****	*****	*	*	****	*****
Smouldering changing to flaming	Waste paper bin fire	****	****	**	**	***	****	****
Flaming (clean burn)	Burning solvents	*	*	*	***	*****	***	****
Flaming (dirty)	Burning oils	**	***	**	***	*****	****	****

Key to fire hazard detection: very good = ***** good = **** moderate = *** poor = ** very poor = *

^A Multi-sensor detector responses could be a combination of the single-sensor responses, but the behaviour of a multi-sensor is dependent on the manner in which the sensors are combined within the detector. The combination of sensors within a multi-sensor detector could provide an enhancement to performance overall and cannot be considered to be the linear sum of the individual sensor responses. The response of multi-sensors is not common across all detector manufacturers due to differences in construction and internal algorithms. The response of a chosen multi-sensor, including its mode and settings, should be properly understood to ensure that the risks are adequately covered. This table shows some typical examples of multi-sensor responses and does not represent an exhaustive list of all possible sensor combinations and algorithms.

Voice Alarms to BS5839-8

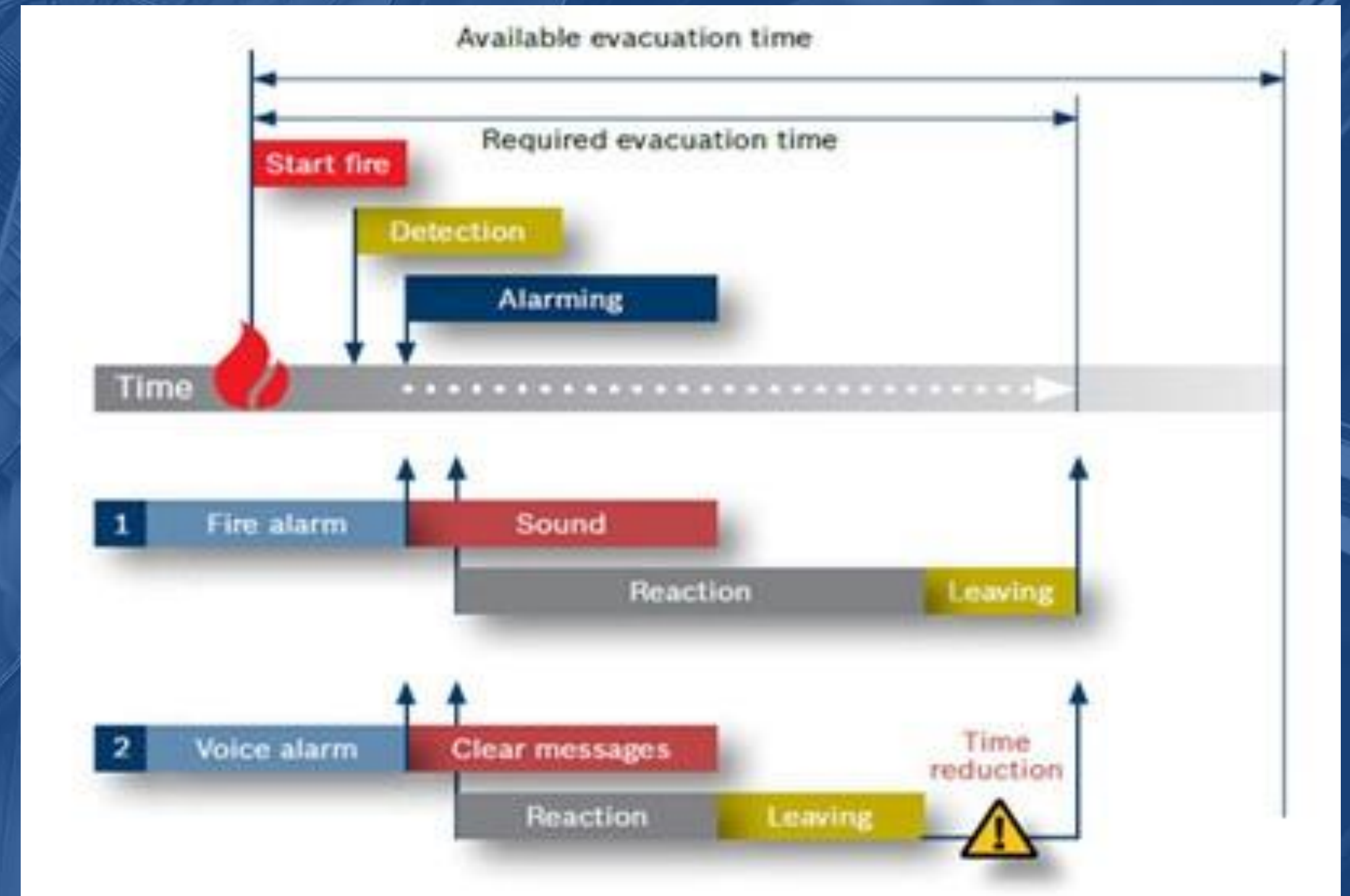
What are the benefits

- They provide occupants clearer certainty of why there is an alarm and what needs to be done. Shortened pre movement time results in higher occupancy capacities being possible
- Under BS9999 they can be used as an enhancement to allow less exit width provisions and extended travel distances.

Where to consider installing them

- Entertainment areas
- Assembly buildings and larger retail premises







Generally which would be the most appropriate system for Building Regulations purposes in the following scenarios. eg Residential LD1, LD2 or LD3. Commercial- Type M, L1, L2, L3, L4 or L5?

	System type
An office building multi storey with potential lone working on the upper floors	Type M and some automatic detection to cover lone working areas L5
A residential care home 10 bedroom	L2 with False alarm measures but as size increases L1/L2 and PHE zone requirements
A 2 storey medium sized shop/ retail unit	Type M
An Assembly building ie Theatre or Events Venue operating near peak physical evacuation capacity.	L2 with false alarm measures and voice alarm L5
Flats above a shop where compartmentation is good	Grade D2 LD3 in each unit. Common areas detection linked to AOV L5
A hotel multi storey	L1 with False alarm measures



Emergency Lighting

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BS 5266-1:2016



BSI Standards Publication

Emergency lighting – Part 1: Code of practice for the emergency lighting of premises

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General requirements of a system

- Uniform light distribution
- No debilitating glare
- Lux requirements - Defined Escape routes - 1lux and
>60m² open plan - 0.5lux
- Locations
- Duration periods



Annex E
(informative)
E.1

Typical illuminance for specific locations

General

A number of locations require higher light levels, and in some cases the emergency illumination is required in specific positions to enable normal activities to be terminated safely.

The applications in E.2 to E.10 are normal activities and less arduous than those requiring high risk task illumination. This is not an exhaustive list, but examples are given of the methodology that can be applied for specific hazard areas.

Guidance on illuminance measurements and calculations for these applications is given in Annex G.

Illuminances for high risk task areas are given in BS EN 1838:2013.

E.2 Kitchens

The illumination in areas where people are preparing or transporting hot food needs to be sufficient for them to be able to leave equipment in a safe condition, e.g.:

- a) gas powered equipment needs to be turned off to ensure that a fully safe condition exists whilst the area is evacuated;
- b) electric appliances need to be isolated to ensure that they do not turn on once the supply is reinstated and cause a possible unsafe condition.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in kitchens.



E.3 First aid rooms

The illumination needs to be sufficient to enable simple medical procedures to be completed, e.g. applying a bandage.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in first aid rooms. The specific level to be used depends on the nature of the task(s) being undertaken.

E.4 Examination and treatment rooms

The illumination needs to be sufficient to enable complex procedures to be completed, e.g. minor operations.

NOTE Operating theatres are outside the scope of this standard.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in examination and treatment rooms. The specific level to be used depends on the nature of the task(s) being undertaken.

E.5 Refuge areas for people with mobility impairments

Designated people within the premises have a responsibility to check and collect people with mobility impairments from designated refuge areas. At any refuge emergency voice communication system, and in the area for transfer of people from wheelchairs to evacuation sleds as applicable, a higher level of illumination than for escape route lighting is likely to be needed.

Table E.1 shows the typical minimum illumination for communication devices and relevant instruction signs within designated refuge areas.



E.6 Plant rooms, switch rooms and means of emergency operation for lifts

In the event of a power supply failure, maintenance or duty engineers are likely to be required to enter plant rooms and switch rooms, and to access means of emergency operation for lifts.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in plant rooms, switch rooms and means of emergency operation for lifts.

In certain circumstances it might be more appropriate to use a portable self-contained emergency lighting unit.

E.7 Inspection of the condition of fire alarm control and indicating equipment

To carry out inspection of the condition of fire alarm panels and repeaters, and fire alarm zone diagrams and instructions, the illumination needs to be sufficient to:

- a) enable displays to be read accurately;
- b) enable staff to locate the source of the fire;
- c) operate controls.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in the vicinity of fire alarm control and indicating equipment. This also applies to any repeater panels or building plans that might be used.



E.8 Reception areas

The reception area used to contact the fire and rescue service needs to have sufficient illumination for the telephone number to be dialled correctly.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in reception areas.

E.9 Panic bars and pads or security devices at exit doors

Panic bars and pads or security devices at exit doors, e.g. a break glass manual release control, need to be sufficiently illuminated to enable them to be easily seen and operated. Exit signs above them need to have downward light panels or a normal emergency luminaire is needed to provide additional illumination. Any operational instructions also need to be readily visible.

NOTE Recommendations for manual release controls, provided to release electronically locked doors, are given in BS 7273-4.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in the vicinity of panic bars, pads and security devices.

E.10 Surrounds of swimming pools, swimming areas and diving platforms or flumes

The surrounds of pools, and the access routes to diving boards or flumes, are areas that need to be cleared safely in the event of a supply failure; the high likelihood of the surfaces being wet increases the slipping hazard.

Table E.1 shows the typical minimum emergency lighting level to be used on sudden failure of the normal lighting in the vicinity of swimming pools, swimming areas and diving platforms or flumes.

Changes from earlier editions



L.2 Design

The location of escape routes has to conform to guidance given in the relevant risk assessment guide.

In earlier editions of BS 5266-1, a reduced light level of a minimum of 0.2 lx on the centreline of escape routes was allowable for routes that were permanently unobstructed. They now need to be reported to the responsible person to assess if they are acceptable or if they need to be upgraded to the current value of 1 lx.

Prior to 1988, open areas were not classified as needing coverage. However, since then BS 5266-1 has recommended that rooms should have emergency lighting if:

- a) they are larger than 60 m²;
- b) they have an escape route passing through them; or
- c) they have a hazard that is identified by the site risk assessment.

If these routes and areas are not provided with adequate emergency lighting, the report needs to recommend that this omission be defined in the risk assessment.

Safety signs have to be adequately illuminated, either as an internally illuminated sign or by having an emergency luminaire produce a vertical illuminance of at least 5 lx at the face of the safety sign (see 5.2.9).

Emergency luminaires have to be located at specific hazard and safety locations, i.e. "points of emphasis".

Emergency Lighting locations



B1 GENERAL PROVISIONS

Table 9 Provisions for escape lighting

Purpose group of the building or part of the building	Areas requiring escape lighting
1. Residential	All common escape routes ⁽¹⁾ , except in 2-storey flats
2. Office, Industrial, Storage and Other non-residential	a. Underground or windowless accommodation b. Stairways in a central core or serving storey(s) more than 18m above ground level c. Internal corridors more than 30m long d. Open-plan areas of more than 60m ²
3. Shop and Commercial and car parks	a. Underground or windowless accommodation b. Stairways in a central core or serving storey(s) more than 18m above ground level c. Internal corridors more than 30m long d. Open-plan areas of more than 60m ² e. All escape routes to which the public are admitted ⁽¹⁾ (except in shops of three or fewer storeys with no sales floor more than 280m ² , provided that the shop is not a restaurant or bar)
4. Assembly and Recreation	All escape routes ⁽¹⁾ , and accommodation except for: a. accommodation open on one side to view sport or entertainment during normal daylight hours
5. Any Purpose Group	a. All toilet accommodation with a floor area over 8m ² b. Electricity and generator rooms c. Switch room/battery room for emergency lighting system d. Emergency control room

Notes:

1. Including external escape routes.

Emergency Lighting BS9999



Table 8 Provisions for emergency escape lighting

Occupancy characteristic	Areas needing emergency escape lighting
A	Underground or windowless accommodation Stairways in a central core or serving storey(s) more than 18 m above ground level Internal corridors more than 30 m long Open-plan areas of more than 60 m ²
B ^{A)}	All escape routes ^{B)} (except in shops of three or fewer storeys with no sales floor more than 280 m ² provided that the shop is not a restaurant or bar)
C	All common escape routes ^{B)} , except in two-storey blocks of flats
Any use	All sanitary accommodation with a floor area over 8 m ² Windowless sanitary accommodation with a floor area not more than 8 m ² Electricity and generator rooms Switch room/battery room for emergency lighting system Emergency control room

^{A)} In areas of shops where the public are not admitted use occupancy characteristic A.

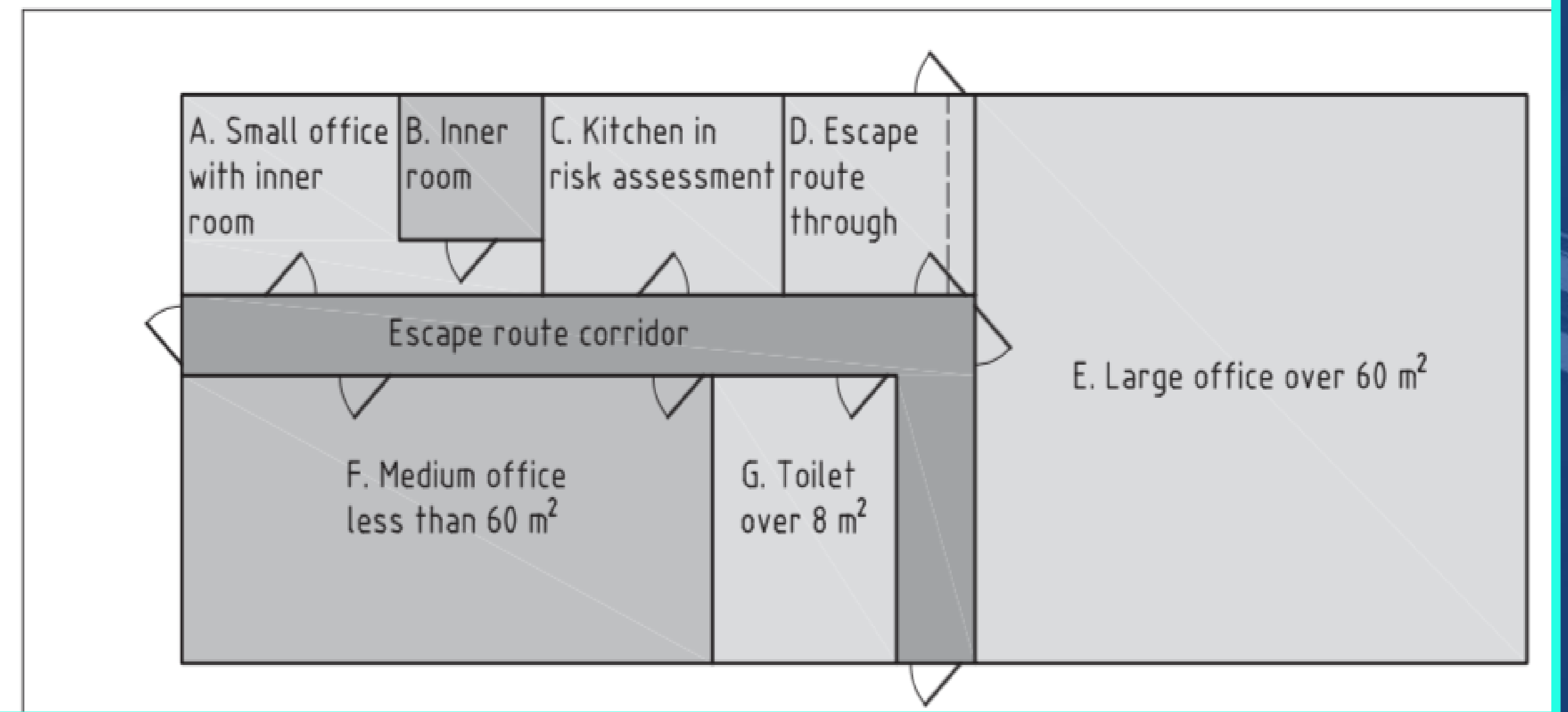
^{B)} Including external escape routes.

Emergency Lighting Locations – Offices

Which rooms require Emergency lighting?



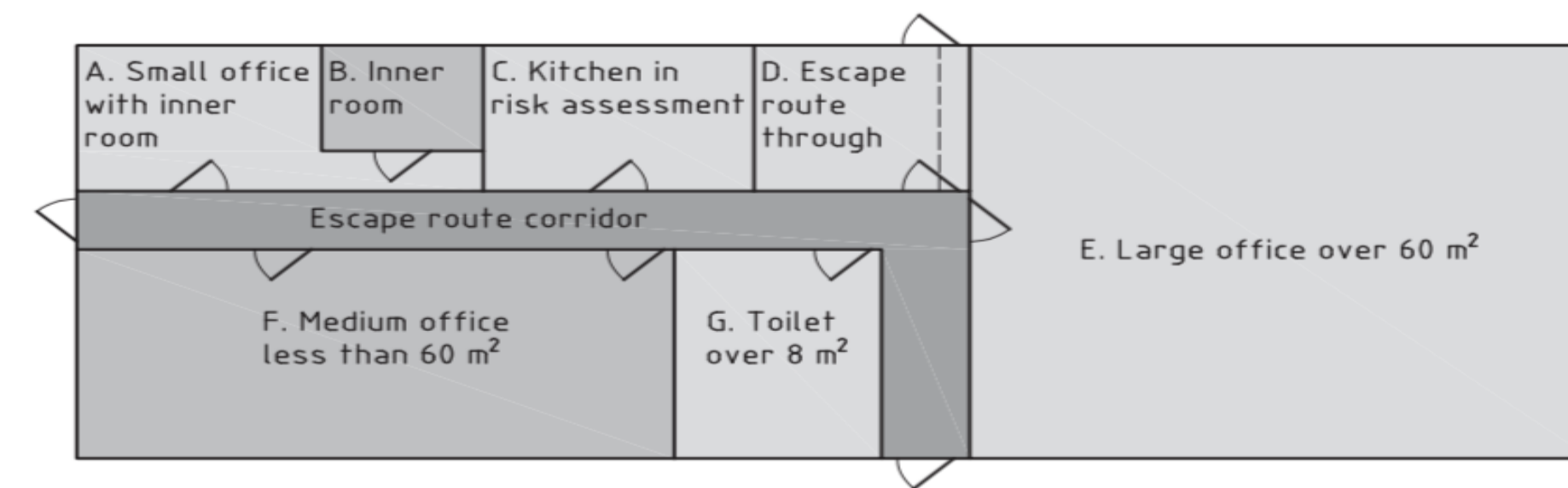
Figure 2 Example of rooms requiring emergency lighting



Emergency Lighting Locations - Offices



Figure 2 Example of rooms requiring emergency lighting



Key

Area	Dimensions	Function and relevant considerations	Emergency lighting needed
Escape route	(2 × 17) m	Corridor leading to exits; luminaires required at change of direction, exits and outside building to place of safety	Yes
Room A with inner room	(3 × 9) m = 27 m ²	Small office in which the office becomes the escape route of the inner room and needs emergency lighting	Yes
Room B	(2 × 4) m = 8 m ²	Inner room with no risks	No
Room C	(3 × 4) m = 12 m ²	Kitchen needing emergency lighting in the risk assessment for the premises	Yes
Room D	(3 × 4) m = 12 m ²	Small office, escape route passes through this open area	Yes
Room E	(10 × 8) m = 80 m ²	Main office larger than 60 m ² floor area	Yes
Room F	(5 × 11) m = 55 m ²	Medium office smaller than 60 m ² floor area	No
Room G	(5 × 6) m = 30 m ²	Toilet larger than 8 m ² floor area	Yes

Emergency Lighting locations



5.2.8.1 General

Siting and illuminance levels of emergency escape lighting luminaires should be in accordance with BS EN 1838.

Emergency escape lighting should be provided in escape routes, open areas, high risk task areas, and points of emphasis including:

- a) near (see Note 1) each exit door intended to be used in an emergency;
- b) near (see Note 1) stairs so that each flight of stairs receives direct light;
- c) near (see Note 1) any other change in level;
- d) externally illuminated escape route signs, escape route direction signs and other safety signs needing to be illuminated under emergency lighting conditions;
- e) at each change of direction (see Note 2);
- f) at each intersection of corridors (see Note 2);

Emergency Lighting



- g) near (see Note 1) to each final exit and outside the building to a place of safety;
- h) near (see Note 1) each first aid post;
- i) near (see Note 1) each piece of fire-fighting equipment and call point;
- j) near (see Note 1) escape equipment provided for disabled people;
- k) near (see Note 1) refuges and call points, including two-way communication systems and disabled toilet alarm call position;
- l) near (see Note 1) manual release controls provided to release electronically locked doors as recommended in BS 7273-4.

NOTE 1 For the purpose of this subclause, "near" is normally considered to be within 2 m measured horizontally.

NOTE 2 For the purpose of this subclause, "at" means that the emergency luminaire would illuminate in both directions at the change of direction or intersection.



6.7.3 Duration

COMMENTARY ON 6.7.3

The time required to evacuate premises depends upon their size and complexity. The duration is dependent not only on the time to evacuate the premises but also on whether they are evacuated immediately on a supply failure and whether they will be reoccupied immediately that the supply is restored.

BS EN 1838:2013, 4.2.5 and 4.3.5 specify a minimum duration of the emergency escape lighting of 1 h.

A minimum duration of 3 h should be used for emergency lighting if premises are not expected to be evacuated immediately in the event of a supply failure, such as sleeping accommodation or places of entertainment, or if the premises are expected to be reoccupied when the supply is restored without waiting for batteries to recharge.

A minimum duration of 1 h should be used only if the premises are expected to be evacuated immediately on supply failure and not reoccupied until full capacity has been restored to the batteries.



Suppression

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- General requirements of a system
- Types of system available
- Where is suppression required
- What type of suppression is permitted?
- Where can this be used as a compensatory feature?



Sprinklers (Property or Life?) Watermist

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BS 9991:2015

Incorporating Corrigendum No. 1



BSI Standards Publication

**Fire safety in the design,
management and use of
residential buildings –
Code of practice**

BS 9999:2017

Incorporating Corrigendum No. 1



BSI Standards Publication

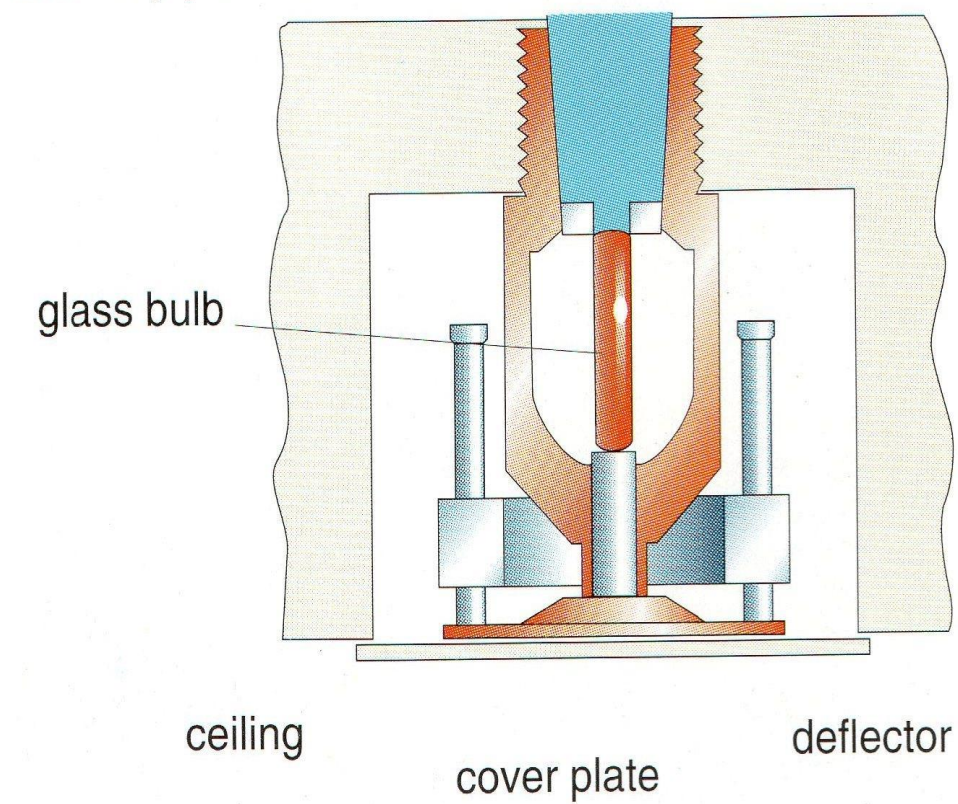
**Fire safety in the design,
management and use of
buildings – Code of practice**

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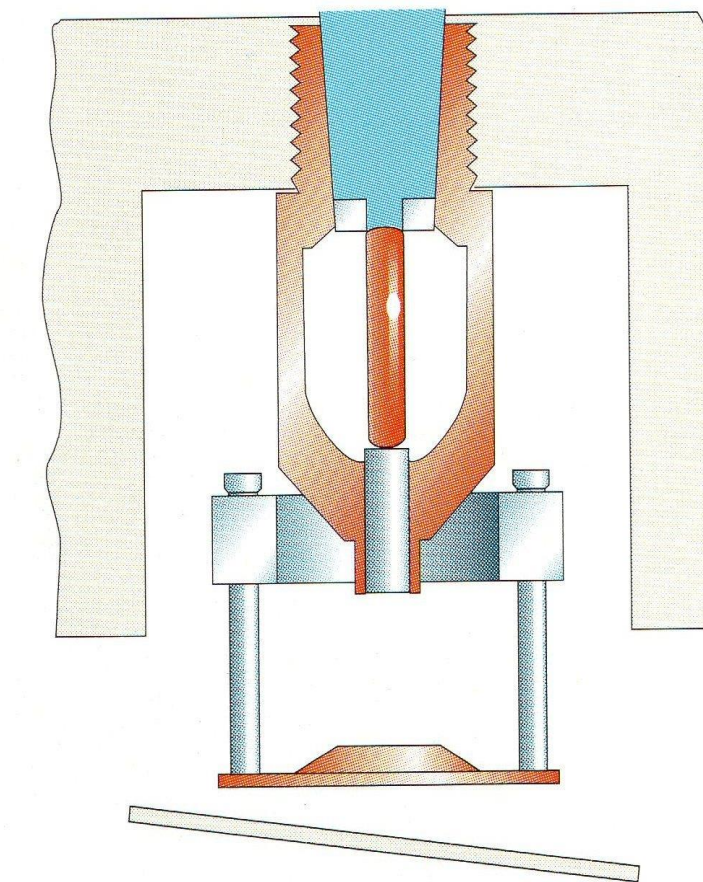


1. Concealed domestic Sprinkler Head

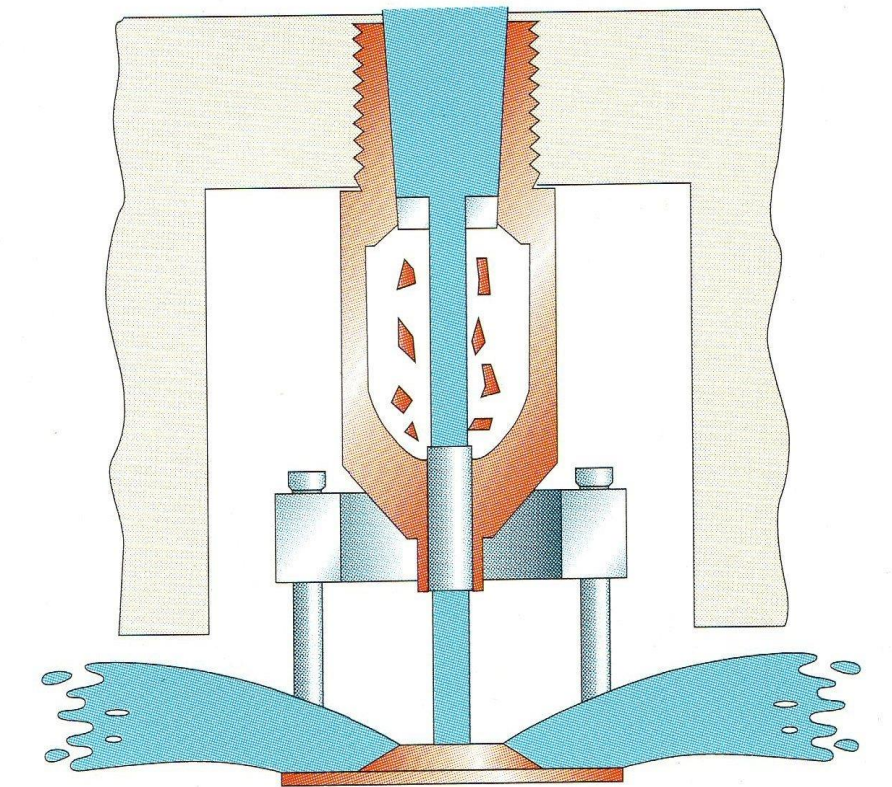
water in pipework



2. Cover plate falls as fire grows and deflector drops



3. Bulb shatters when exposed to heat and water is released



Watermist Suppression



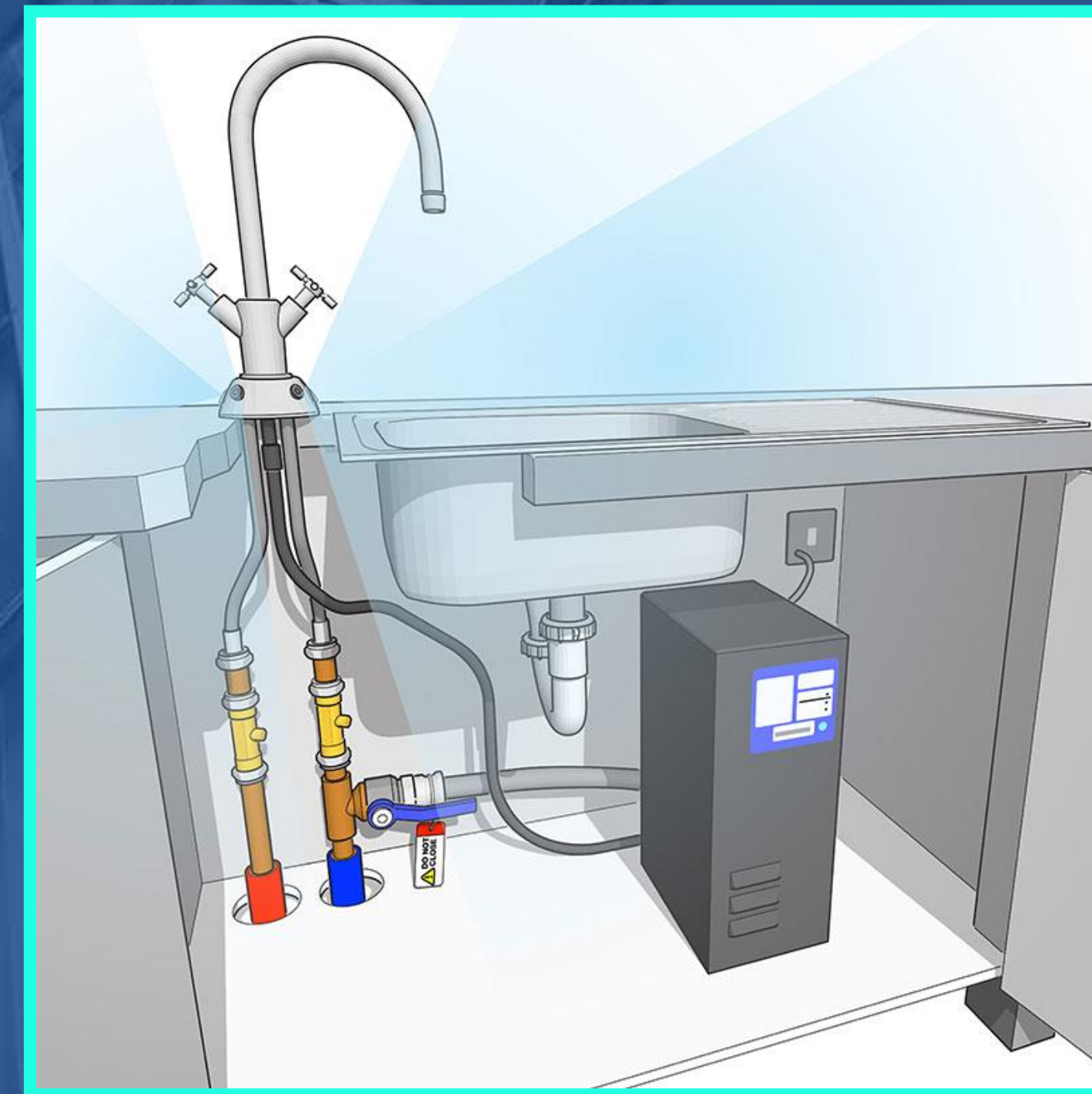
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Where is suppression required?

- Schools by Assessment
- Tall buildings
- Residential Care by Assessment

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What type of suppression is permitted?

- Within residential flats and houses
- Flats common areas
- Commercial property



As a recognised compensatory feature in Approved guidance BS9991 & BS9999

- B1 – Extend travel distances
- B1 – Allows inner rooms above first floor level
- B3 – Increases compartment sizes
- B3 – Reduce Structural Fire resistance
- B4 – Boundary space separation half the requirements
- B5 – Extend the distance and access from pump appliances to building

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Fire Curtains

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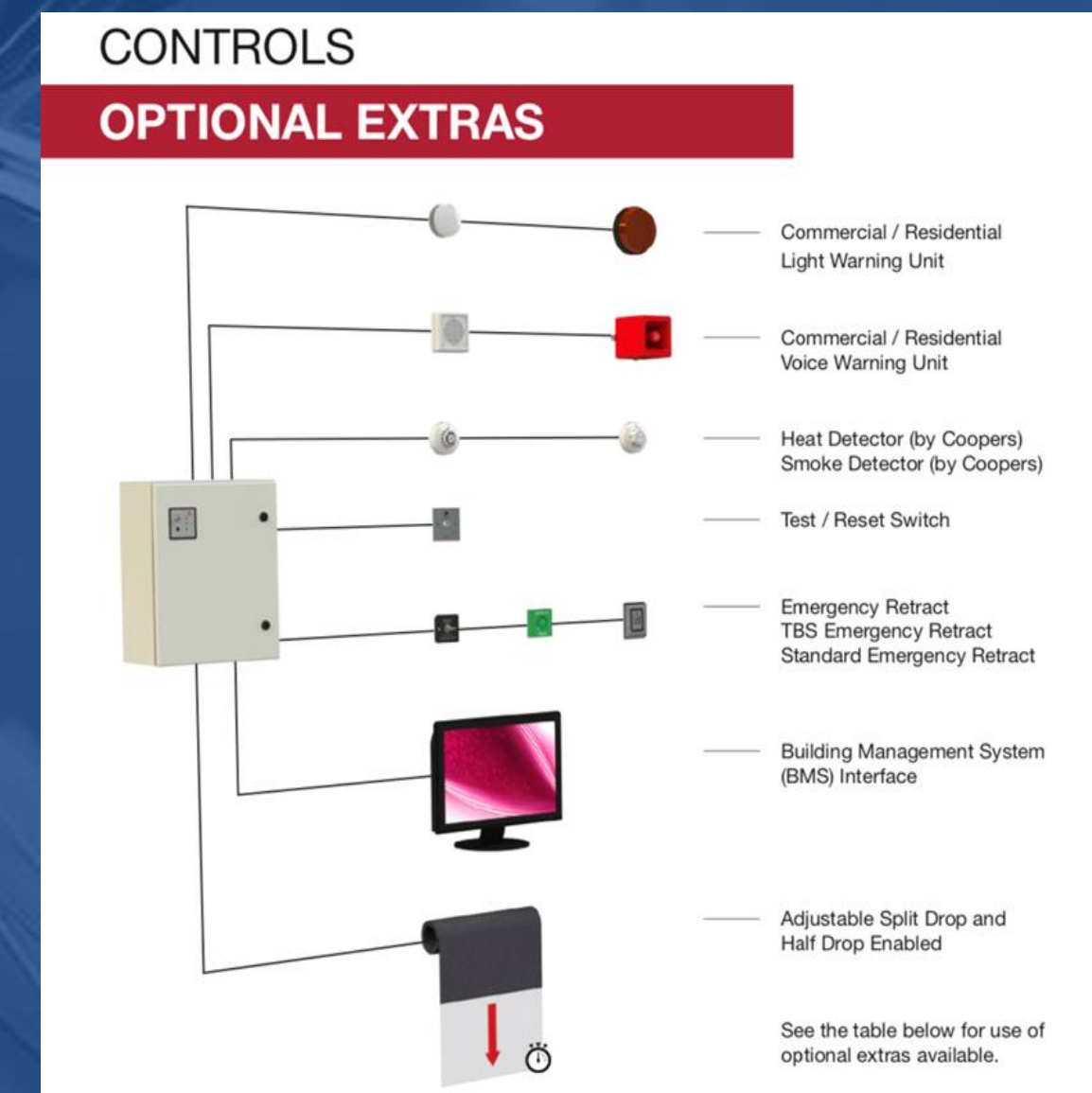




- Where do they have their uses
- In maintaining protected escape routes
- Compartmentation and fire containment
- Forming ceiling smoke reservoirs
- Allowing unobstructed free circulation but protection of escape routes when needed
- B4 Boundary condition situations



- Controls
- Linked to detection
- Obstruction alerts
- Operation alert
- Manual retract buttons
- Half drop facility
- Types
- Smoke or Fire resistance
- Radiant heat provision





Thank you for listening

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