



BS 5588 : Part 5 : 1986

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British Standard

Fire precautions in the design and construction of buildings

Part 5. Code of practice for firefighting stairways and lifts

Règles de prévention des incendies dans la conception et la construction des bâtiments
Partie 5. Escaliers et ascenseurs de secours contre l'incendie — Code de bonne pratique

Brandschutzmaßnahmen bei Planung und Errichtung von Gebäuden
Teil 5. Leitfaden für zur Brandbekämpfung vorgesehene Treppenaufgänge und Aufzüge

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Foreword

This new code of practice was prepared under the direction of the Fire Standards Committee. This code is published as a Part of BS 5588; other Parts already published are as follows:

- Part 1. Residential buildings
 - Section 1.1 Code of practice for single-family dwelling houses
- Part 2. Code of practice for shops
- Part 3. Code of practice for office buildings
- Part 4. Smoke control in protected escape routes using pressurization.

Other Parts will include the revision of CP 3 : Chapter IV : Part 1, which will appear as BS 5588 : Section 1.2, and new codes for the precautions to be taken in places of assembly, for means of escape for disabled people, for ventilation and air conditioning ducts and for enclosed shopping complexes. Other Parts may also be added to BS 5588.

This code provides recommendations for the design, construction and siting of firefighting stairways and lifts in order to assist the fire service in firefighting operations in high or large buildings or buildings with deep basements.

The design and planning of a firefighting stairway or lift will of necessity have regard to the potential risks of fire in the firefighting shaft itself (i.e. the firefighting lobbies and stairway and, if provided, the firefighting lift), as well as to those elsewhere in the building. This code includes recommendations for the necessary combination of structural fire safety arrangements and ventilation for the firefighting shaft, as well as recommendations for the firefighting lift and its engineering and communication systems.

Unlike a normal passenger lift, a firefighting lift is intended to transport firefighters and their equipment when there is a fire in the building. This code recommends design features necessary for a lift to be used with an acceptable measure of safety when there is a fire in a building. It is the product of a study of all aspects of the use of lifts during fires in buildings, including the history of failures of lifts and of casualties arising from their ill-considered use, and also of existing and earlier technical standards.

As far as possible this code makes reference to BS 5655 for the construction of the lift, and adds only the provisions necessary for a firefighting lift that are not normally provided on an ordinary passenger lift.

This code, whilst not excluding the use of hydraulic firefighting lifts, nevertheless considers electric firefighting lifts only. However, the principles behind the recommendations are equally applicable to hydraulic firefighting lifts.

In this code a commentary on the relevant principles is followed by any recommendations that are made. The commentary is intended to provide an explanatory background to recommendations, especially if the recommendations might otherwise appear to be arbitrary.

The figures are intended to clarify concepts and should not be taken as indicating the only acceptable forms of planning.

It has been assumed in the drafting of this code that the execution of its provisions will be entrusted to appropriately qualified and experienced people.

Compliance with a British Standard does not of itself confer immunity from legal obligations. In particular, attention is drawn to clause 3.

Contents

	Page
Foreword	Inside front cover
Committees responsible	Back cover
Code of practice	
Section one. General	
1 Scope	2
2 Definitions	2
3 Relationship with statutory provisions	2
Section two. Planning and construction	
4 Firefighting shafts	5
5 Firefighting stairways	7
6 Firefighting lobbies	7
7 Fire mains and landing valves	7
8 Smoke control	7
9 Construction of the firefighting shaft	12
Section three. The firefighting lift installation	
10 General	15
11 Firefighting lift cars	15
12 Firefighting lift wells	15
13 Firefighting lift machine rooms	16
14 Firefighting lift switch	16
15 Fire service communications system	18
16 Electrical supplies and installations	18
Appendix	
A Operational tests for firefighting lifts	20
Figures	
1 Typical firefighting shaft layouts	6
2 Smoke control for a typical firefighting stairway, lobby and lift next to an exterior wall	8
3 Smoke control for a typical firefighting stairway, lobby and lift not situated next to an exterior wall	9
4 Smoke control for a typical firefighting stairway, lobby and lift with access from an external open balcony	10
5 Passenger lifts adjacent to a firefighting lift	17

Section one. General

1 Scope

This code of practice provides guidance for designers and the building construction team in providing firefighting stairways and lifts to assist the fire service in firefighting operations.

Some recommendations are also made with respect to passenger, goods and service lifts adjacent to a firefighting lift where they affect the use and safety of the firefighting lift.

No recommendations are made for the use of any lift for the purpose of escape in the event of fire.

NOTE. The titles of the publications referred to in this code are listed on the inside back cover.

2 Definitions

For the purposes of this code the following definitions apply.

2.1 call. The operation of pressing a landing call button to call the lift, or, in the lift car, of pressing the appropriate button to take the lift to the desired level.

NOTE. See also 2.22.

2.2 car control station. The control panel in the lift car for the use of passengers.

2.3 control equipment. Electrical switches, door interlocks and apparatus associated with the operation and programming of the lift service.

2.4 depth (of a building). The level of the surface of the lowest point of the floor of the lowest storey, measured from the level of the surface of the highest fire service access roadway adjacent to the entrance to the firefighting shaft where the measurement is greatest.

2.5 evacuation level(s). The storey or storeys at which final exits suitable for the evacuation of persons are available.

NOTE. This is not necessarily fire service access level (2.13).

2.6 fire door. A door or shutter provided for the passage of persons, air or things which, together with its frame and furniture as installed in a building, is intended, when closed, to resist the passage of fire and/or gaseous products of combustion and is capable of meeting specified performance criteria to those ends.

2.7 firefighting lift. A lift designated to have additional protection, with controls that enable it to be used under the direct control of the fire brigade in fighting a fire.

2.8 firefighting lobby. A protected lobby for providing access from a firefighting stairway to the accommodation area, and to any associated firefighting lift.

2.9 firefighting shaft. A protected shaft containing a firefighting stairway, firefighting lobbies and, if provided, a firefighting lift.

2.10 firefighting stairway. A protected stairway communicating with the accommodation area only through a firefighting lobby.

2.11 fire main. A water supply pipe, fitted with landing valves at specified points, installed in a building for firefighting purposes.

2.12 fire resistance. The ability of a component or construction of a building to satisfy for a stated period of time some or all of the criteria specified in the appropriate Part of BS 476, currently Part 8, namely stability, integrity and insulation.

2.13 fire service access level. A level at which there is suitable entry to the building and to a firefighting shaft from an area to which fire service appliances have access.

2.14 height (of a building). The level of the surface of the highest point of the floor of the highest storey (excluding any such storey consisting exclusively of plant rooms), measured from the level of the surface of the lowest fire service access roadway adjacent to the entrance to the firefighting shaft where the measurement is greatest.

2.15 lift landing. The lobby floor space from which the lift car is normally entered at each level.

2.16 lift landing door. Hinged or sliding portion of a lift well enclosure at each landing that gives access to a lift car when open.

NOTE. This is not the lift car door.

2.17 lift machine. The unit, including the motor, that drives and stops the lift.

2.18 lift well. Space in which the lift car and the counterweight (if any) move. This space is materially enclosed by the bottom of the pit, the approximately vertical walls and the ceiling.

2.19 non-combustible. Capable of satisfying the performance requirements specified in BS 476 : Part 4.

2.20 pressurization. A method of protecting the firefighting shaft against the ingress of smoke by maintaining the air within it at pressures higher than those in adjacent parts of the building.

2.21 protected. Enclosed (other than any part which is an external wall of a building) with fire-resisting construction.

2.22 registered call. A call made on a car control station or from a landing call button that is accepted by the control equipment.

2.23 smoke shaft. An enclosed space in a building provided for venting smoke from a firefighting stairway or one or more firefighting lobbies.

3 Relationship with statutory provisions

3.1 General

It is important to appreciate the relationships between this code and the various statutory provisions relevant to the design and construction of new buildings and to the fire precautions to be provided in existing buildings. The relevant legislation indicated in general terms in 3.2 has to be complied with in the event of a conflict with this code.

3.2 Building regulations

The design and construction of new buildings, and of alterations of existing buildings, are controlled by the

following statutory provisions which are collectively referred to as building regulations in this code.

England and Wales: The Building Regulations;

Scotland: The Building Standards (Scotland) Regulations;

Northern Ireland: The Building Regulations (Northern Ireland).

It should be noted that some county and other authorities in England and Wales have local powers in respect of fire precautions, which may include the provision of firefighting stairways and/or lifts.

Section two. Planning and construction

4 Firefighting shafts

4.1 Criteria for the provision of firefighting shafts

4.1.1 Commentary. In high buildings or buildings with a number of basements it is necessary to provide firefighters with a firefighting lift to take them and their equipment to the fire, so as to avoid the delays and fatigue that would occur in walking up or down stairs with heavy equipment. Associated with a firefighting lift is a firefighting stairway for access and escape in emergency, with protected lobbies at each landing, containing a landing valve on a dry or wet rising or falling fire main. In large buildings used for trade, warehousing or manufacturing purposes which, although not high or deep enough to warrant a firefighting lift, are sufficiently large to make firefighting from outside the building difficult, a firefighting stairway without a firefighting lift may be required.

When buildings are designed the level(s) of the fire service access roadway(s) may not be known. Whilst in these circumstances the measurements of depth and height (see 2.4 and 2.14) may be made from ground level for initial design purposes, the building, when constructed, will still have to satisfy the criteria for the provision of firefighting shafts detailed in 4.1.2.

NOTE. Where fire service access is required it should be agreed with the fire authority.

4.1.2 Recommendations. The following recommendations are applicable.

(a) Buildings or parts of buildings of height (see 2.14) exceeding 18 m or depth (see 2.4) exceeding 9 m should be provided with firefighting shafts each containing:

- (1) a firefighting stairway (see clause 5);
- (2) firefighting lobbies provided with a fire main (see clause 6);
- (3) a firefighting lift installation (see section three).

NOTE. The reference to parts of buildings covers situations such as a tower block rising above a podium.

(b) Buildings of height (see 2.14) exceeding 7.5 m, with the area of any storey above the ground storey not less than 600 m², that are used for trade, warehousing or manufacturing purposes, should be provided with firefighting shafts each containing:

- (1) a firefighting stairway (see clause 5);
- (2) firefighting lobbies (see clause 6).

4.2 Number of firefighting shafts

4.2.1 Commentary. More than one firefighting shaft may be needed, depending on the distance from a firefighting lobby at which it is practical to run out a hose and fight a fire. If there are towers rising from a podium, even though each tower may be of limited floor area, a firefighting shaft is required to serve each individual tower.

4.2.2 Recommendation. Sufficient firefighting shafts should be provided such that on every storey

- (a) with a height (see 2.14) exceeding 18 m; or
- (b) with a depth (see 2.4) exceeding 9 m; or

(c) above the ground storey in buildings as described in 4.1.2(b):

the area on that storey served by any firefighting shaft does not exceed 900 m² and the distance along which hose can be laid from the doorway between the firefighting shaft and the accommodation to any point on that storey does not exceed 60 m.

4.3 Extent of firefighting stairways or lifts

4.3.1 Commentary. Whilst it is preferable for a firefighting stairway or lift to serve all storeys in a building, this does not invariably mean every floor, for example in buildings containing maisonettes accessed at one level only.

4.3.2 Recommendations. The following recommendations are applicable.

- (a) Every storey in the building should be served by a firefighting stairway (see also 5.2(c)).
- (b) If a firefighting shaft contains a firefighting lift, the firefighting stairway in that shaft should serve every storey served by the firefighting lift.
- (c) With the exception of any storey on which there is no entrance to any accommodation, for example, as in the case of some designs of flats or maisonettes, and of the topmost storey of the building if it consists exclusively of plant rooms:

- (1) in a building of depth (see 2.4) exceeding 9 m the firefighting lift should serve all storeys below the fire service access level;
- (2) in a building of height (see 2.14) exceeding 18 m, the firefighting lift should serve all storeys above the fire service access level;
- (3) in a building of depth (see 2.4) exceeding 9 m and of height (see 2.14) exceeding 18 m, all storeys should be served by a firefighting lift (although not necessarily by the same lift).

(d) If a building contains separate units of accommodation with their own entrances from common circulation spaces, for example as is the case with some flats and maisonettes, there should be access from a firefighting lift, either directly or via a common circulation space, to each unit.

4.4 Location of firefighting shafts

4.4.1 Commentary. Firefighting shafts should preferably be sited against an exterior wall to facilitate permanent ventilation and smoke control. In factory, trade and warehouse buildings, and in the case of other occupancies with a similar high fire risk or high fire load, firefighting shafts should be sited against an exterior wall, even if a pressurization system or a smoke shaft is provided, to facilitate firefighting and for the safety of fire service personnel.

The separation of the accommodation from the firefighting shaft (see 4.6), together with the provision of means for smoke release in firefighting stairways and firefighting lobbies, is intended to provide a substantially smoke-free environment for firefighting operations.

4.4.2 Recommendations. The following recommendations are applicable.

- (a) Firefighting shafts in factory, trade and warehouse buildings and other occupancies with a similar or higher fire risk or fire load should be sited against an exterior wall.
- (b) Firefighting shafts in buildings other than described in (a) should preferably be sited against an exterior wall to facilitate smoke control (see clause 8).

4.5 Fire service access into firefighting shafts

4.5.1 Commentary. It is preferable for the fire service access to the firefighting shaft to be directly from the open air. For firefighting shafts containing a firefighting lift, if it is not possible to enter directly from the open air, then the route to the firefighting shaft needs to be protected by fire-resisting construction to ensure that a fire does not affect the route or cut off the means of escape for personnel fighting a fire within the building.

4.5.2 Recommendation. At fire service access level, entry to a firefighting shaft should be available from either

- (a) the open air; or
- (b) where the firefighting shaft includes a firefighting lift, from two separate directions, at least one being from the open air by way of a protected corridor giving access solely to the firefighting shaft.

4.6 Layout of firefighting shafts

4.6.1 Commentary. It is essential that firefighting personnel, having left the firefighting lift to enter the firefighting lobby, can enter the firefighting stairway in case of need without having to traverse an area of risk within any storey of the building. Therefore it is necessary that the firefighting lift, lobbies and stairway are within a protected enclosure and that the firefighting stairway is not remote from the firefighting lift and lobbies.

NOTE. This code recommends that fire service personnel have access from the firefighting lift to the firefighting stairway (via the firefighting lobby) without entering the accommodation, both for

their safety and to ease the movement of equipment. However, in blocks of flats or maisonettes there may be circumstances in which the firefighting lift may be separated from the firefighting stairway and fire main; such circumstances are detailed in CP 3 : Chapter IV : Part 1.*

Fire protection of a firefighting stairway or lift relies among other things upon the existence of two fire-resisting doorsets forming a lobby to protect the firefighting lift and stairway from a fire on the floor area.

Except where a fire service access level is also the lowest storey served by a firefighting lift, the firefighting stairway is always separated from the firefighting lift by a firefighting lobby (see figure 1). This is to minimize the risk of smoke entering the stairway via the lift well.

4.6.2 Recommendations. The following recommendations are applicable.

- (a) At all levels other than fire service access level, access to the accommodation from the firefighting lift or stairway should be provided.

NOTE 1. At fire service access level, access to the accommodation from the firefighting shaft is not essential.

NOTE 2. If the firefighting lift does not serve the topmost storey of a building (see 4.3.2(c)), the firefighting lobby on the topmost storey serves the firefighting stairway only. If the topmost storey consists only of the firefighting lift motor room, no lobby is necessary.

- (b) The firefighting stairway and any firefighting lift should be separated from the accommodation by at least two fire doors.

NOTE. One of the fire doors between the firefighting lift and the accommodation will be the firefighting lift landing door (see 9.3(a)(3) and 9.4).

- (c) All communication between the firefighting stairway and firefighting lift and the accommodation should only be via the firefighting lobby.

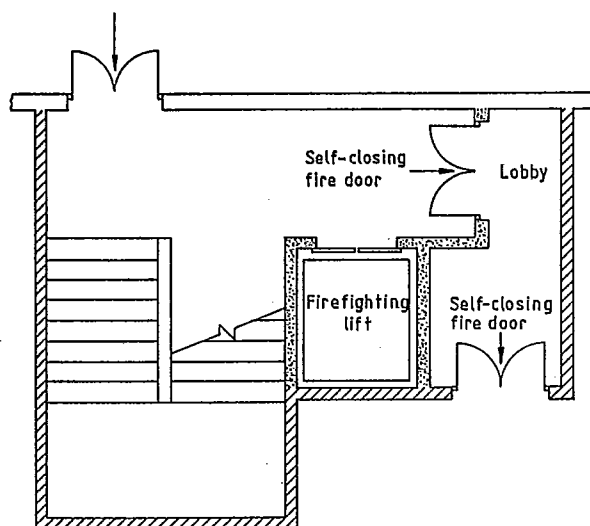
- (d) The firefighting stairway and firefighting lift should be separated by fire-resisting construction in accordance with 9.2 and 9.3(c) at all levels other than a fire service access level that is the lowest storey served by a firefighting lift.

* Under revision, to be published as BS 5588 : Section 1.2.

BS 5588 : Part 5 : 1986

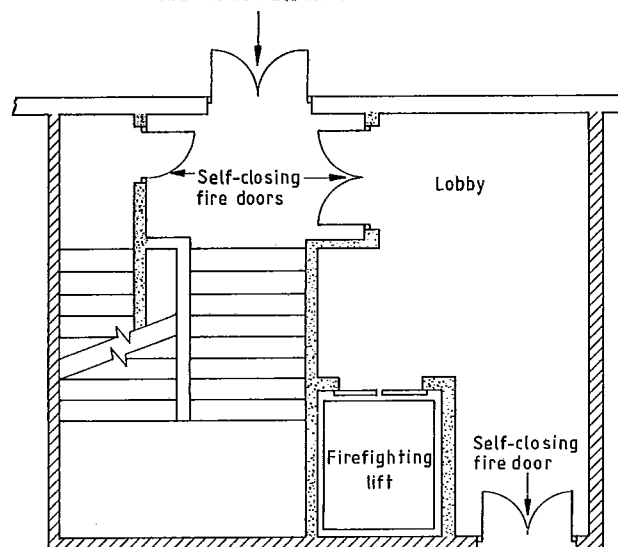
Section two

Fire service access at
fire service access level



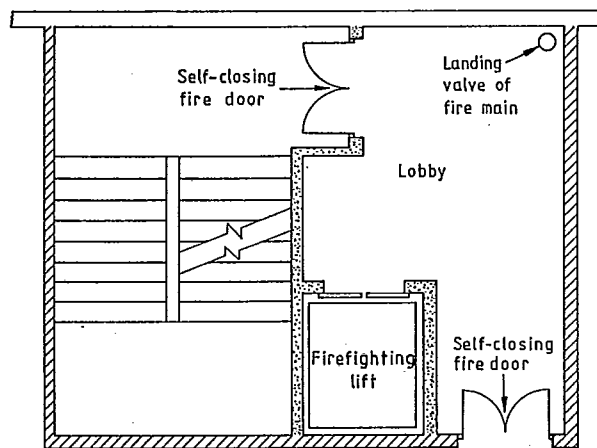
(a) Fire service access level (lowest storey of a building)

Fire service access at
fire service access level



(b) Fire service access level (lower storeys served by a firefighting lift)

NOTE. A stairway serving floors both above and ground level needs to be partitioned at or about ground level, which may not necessarily be fire service access level.



(c) Storeys other than fire service access level

Key

-  Minimum fire resistance of 2 h from outside the firefighting shaft and 1 h from inside the firefighting shaft
-  Minimum fire resistance of 1 h from both sides

Figure 1. Typical firefighting shaft layouts