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## **Safety rules for the construction and installation of lifts — Part 72: Firefighters lifts**

*Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen — Teil 72: Feuerwehraufzüge*

*Règles de sécurité pour la construction et l'installation des ascenseurs — Partie 72 : Ascenseurs*

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## Foreword

This document has been prepared by CEN/TC 10, "Passenger, goods and service lifts".

This document is currently submitted to the Formal Vote.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

This is the first edition of the standard.

This standard is part of the EN 81 series of standards: "Safety rules for the construction and installation of lifts" and is complementary to the introduction of EN 81Part 1 and Part 2 and prEN81 Part 5, Part 6 and Part 7.

**NOTE** Regulations concerned with safety in the event of fire in buildings vary from country to country and have not to-date been standardised at either an international or European level.

## **Introduction**

This European Standard is a Type C-type Standard as stated in EN 1070.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered is indicated in the scope of this document.

When provisions of this C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for lifts that have been designed and built according to the provisions of this type C standard.

The following assumptions were made whilst writing this standard:

- 0.1** The protected lobby and lift well are designed to restrict the ingress of smoke;
- 0.2** The building design limits the flow of water into the lift well;
- 0.3** Firefighters lifts are not escape routes, such as staircases etc.;
- 0.4** A firefighters lift is located within a fire protected environment. This Standard covers only those requirements which relate to the lift installation. It does not prescribe requirements for the fire resisting structure of the building essential to provide the fire protected environment;
- 0.5** Negotiations have been made between the owner/customer and installer concerning:
  - a) the intended use of the lift;
  - b) environmental conditions;
  - c) civil engineering problems; and
  - d) other aspects related to the place of the installation and the rescue of persons from within the car.

**NOTE** Developers and Architects will need to take account of National Building Regulations in providing a suitable fire resistant structure of the building, protected lobbies, fire detection and extinguisher systems. Examples are shown in annex B (informative) and annex E (informative).

## 1 Scope

1.1 This standard applies to Firefighters lifts as defined in clause 3.5.

1.2 This standard is not applicable to:

- double-deck lifts;
- lifts installed in existing buildings;
- important modification to existing lift installed before the publication of this standard;
- dual entry lifts, where the protected firefighters lift lobbies are not located on the same side as that of the fire service access level.

However, this standard may usefully be used as a basis.

1.3 This standard deals with the significant hazards, hazardous situations and events relevant to Firefighters lifts (as listed in clause 4) when they are used as intended and under the conditions as foreseen by the installer.

1.4 This document is applicable to new firefighters lifts in new buildings which are installed after the date of publication of this document by CEN.

1.5 This Standard gives the additional or deviating requirements to EN 81 Part 1 and Part 2 and prEN81 Part 5, Part 6 and Part 7 which shall be available for lifts which may be used for firefighting and evacuation purposes under firefighters control. Such lifts can only operate within a protected environment as described in the annex B (informative) of this Standard. In all other respects such lifts are designed in accordance with the Lifts Directive 95/16/EC and EN 81 Part 1 and Part 2 and prEN81 Part 5, Part 6 and Part 7 where applicable.

1.6 This standard does not consider the use of lifts with partially enclosed wells for use as firefighters lifts.

1.7 This standard ceases to apply if the fire eventually breaks into a protected lobby (see annex A, Figure A.2 informative).

NOTE A firefighting concept is given in annex A (informative).

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 81-1:1998, *Safety rules for the construction and installation of lifts and service lifts - Part 1: Electric lifts.*

EN81-2:1998, *Safety rules for the construction and installation of lift - Part 2: Hydraulic lifts.*

prEN81-5:1999, *Safety rules for the construction and installation of lifts – Part 5: Screw lifts.*

prEN81-6:1999, *Safety rules for the construction and installation of lifts – Part 6: Guided chain lifts.*

prEN81-7:1999, *Safety rules for the construction and installation of lifts – Part 7: Rack and pinion lifts.*

prEN81-70:1999, *Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger – Part 70: Lifts for access and use by the disabled.*

prEN81-71, *Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts – Part 71: Vandal resistant lifts.*

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prEN81-73, *Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts – Part 73: Behaviour of lifts in the event of fire.*

EN131-1:1993, *Ladders - Specification for terms, types, functional sizes - Basic terminology, methodology.*

EN 1050:1996, *Safety of machinery – Principles for risk assessment.*

EN 1070:1998, *Safety of machinery - Terminology.*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code).*

ISO 4190-1:1999, *Lifts of Classes I, II, III & VI.*

### 3 Terms and definitions - Symbols and abbreviated terms

For the purposes of this European Standard the definitions stated in EN 1070 and EN81 Parts 1, 2 apply.

Additional definitions specifically needed for this document are added below:

#### 3.1

##### **control system**

a system which responds to input signals and generates output signals causing the equipment under control to operate in the desired manner

#### 3.2

##### **evacuation**

evacuation is the organised and controlled movement of persons in a building from a dangerous area to a safe area. Evacuation can be from floor to floor and not necessarily to outside the building

#### 3.3

##### **evacuation level(s)**

the level(s) at which final exits for the evacuation of people are located. This is not necessarily the fire service access level

#### 3.4

##### **fire compartment**

a fire compartment is a sub-division of a building by walls and/or floors for the purpose of limiting the spread of fire and hot gases within the premises

#### 3.5

##### **firefighters lift**

a lift installed primarily intended for passengers use which has additional protection, controls and signals which enable it to be used under the direct control of the fire service

#### 3.6

##### **fire protection**

fire protection covers measures to prevent the outbreak of fire and fire spread in all cases to safeguard escape routes and create the assumption of effective firefighting. including the determination of the fire resistance, fire load and behaviour of building materials and structures during a fire

#### 3.7

##### **firefighters lift switch**

a switch located at the fire service access level, outside of the well, that is intended to be used to give priority service for firefighters

#### 3.8

##### **fire service access level**

the entry level in the building intended to be used by firefighters to gain access to the firefighters lift

**3.9****protected environment**

compartments within a building which provide protection against a fire hazard

**3.10****protected lobby**

fire protected environment providing protected access from the usage area of the building to the firefighters lift

**4 List of significant hazards**

**4.1** This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this Standard, identified by risk assessment as significant for this type of lift and which require action to eliminate or reduce risk.

**4.2** Significant Hazards dealt with in this Standard are shown in the Tables 1 and 2 below:

**Table 1 — List of significant hazards and hazardous situations - Environment**

Significant Hazards and Hazardous situations - Environment		Information in this standard
1	Fire / heat / hot gazes may spread in to a lift well / machinery space	0.1 / 0.4 / 5.1
2	Exposed or obstructed lift equipment	0.1 / 0.4 / 5.1
3	Lift not useable long enough for fire fighter's	0.1 / 0.3 / 0.4 / 5.1 / 5.7
4	Firefighters > 2 minutes delay	0.1 / 0.3 / 0.5 / 5.1 / 5.7
5	Flow of water into the lift well	0.2
6	Entrapment on protected lobby due to a lift failure	0.3 / 0.4
7	Unsafe Environment for fire fighter's /people waiting to be rescued	0.3 / 0.4
8	Structure collapse before the firefighters have finished with the lift	0.4
9	Not having enough or correct located firefighters lift to move the firefighters through the building.	0.5

**Table 2 — List of significant hazards and hazardous situations – firefighters lift**

Significant Hazards and Hazardous situations according to EN1050 for the Fire fighters Lift, including the hazardous situation 1 of Table 1		Requirements and clauses in this standard
<b>EN 1050</b>		
	General hazards for lifts	5.1 / 5.2.1 / 5.8.3 / 5.8.4
1.5	— trapping hazard	5.2.2 / 5.4 / 5.6 / 5.7 / 5.8 / 5.9 / 5.10 / 5.11 / 5.12
5.8.6	Firefighters > 2 minutes delay	5.2.3 / 5.2.4 / 5.6 / 5.8 / 5.10 / 5.11 / 5.12.3 / 6 / 7
9	Combination of hazards	5.8.7 / 5.8.8 / 5.8.9
10.1	Failure or malfunction of the controller	5.3 / 5.4 / 5.7 / 5.8.5 / 5.11.1 / 5.11.2 / 5.12.3
8.6	Human error, human behaviour	5.12
8.7	Inadequate design, location or identification of manual controls,	5.8.1 / 5.8.2 / 5.11.3
	Inadequate marking	5.11.4
13	Failure of the power supply	5.10

## 5 Safety requirements and/or protective measures

### 5.1 Environment/Building requirements

**5.1.1** The firefighters lift shall be located in a well with a protected lobby in front of every lift landing door. The area of each protected lobby is given by the requirements for the transportation of stretchers and the location of the doors in each single case. See annex B (informative) and annex E (informative).

If there are other lifts in the same well, then the entire common well shall fulfill the fire resistance requirements of firefighters lift wells. This level of fire resistance shall also apply to the protected lobby doors and machine room. See annex B (informative). Where there is no intermediate fire wall to separate the firefighters lift from other lifts in a common well then all lifts and their electrical equipment must have the same fire protection as the firefighters lift, to ensure the correct functioning of the firefighters lift.

**5.1.2** The lift shall be designed to operate correctly according to the following conditions:

- a) 65 °C in the protected lobbies and machinery spaces;
- b) where the electrical cabinets and cabinets containing electronic components are installed outside of the well or machine room if provided, the installer shall ensure that they are located in a protected environment. This protected environment shall have the same fire protection as the protected lobbies;
- c) all other electrical/electronic components of the firefighters lift, not in the protected lobby or machinery space, shall be designed to function correctly in an ambient temperature range of 0 °C to 40 °C;
- d) electrical/electronic landing control devices and indicators shall enable the firefighters lift to continue to function as required, when operating in an ambient temperature range of 0 °C to 65 °C, for at least 2 hours;
- e) the correct functioning of the lift control shall be ensured in smoke filled wells and/or machine rooms for at least 2 hours.

**5.1.3** Where a firefighters lift has more than one car entrance each entrance shall have a protected lobby.

**5.1.4** Where the firefighters lift has a dual entrance car, any lift landing door(s) which are not intended to be used by firefighters shall be protected in such a way that they do not become exposed to a temperature exceeding 65 °C.

**5.1.5** It is a prerequisite that the source of the secondary power supply shall be located in a fire protected area.

**5.1.6** The firefighters lift primary and secondary electrical power supply cables shall be fire protected and separated from each other and other power supplies.

**5.1.7** The following significant hazards are not dealt with in this standard:

- a) not having enough or correctly located firefighters lifts to move the firefighters up the building;
- b) entrapment in lobby due to absence of lift service;
- c) a fire in the firefighters lift well, protected lobby, machinery space or lift car;
- d) structure collapse before the firefighters have finished with the lifts;
- e) The absence of identification sign at any floor.

### 5.2 Fundamental firefighters lift requirements

**5.2.1** The firefighters lift shall be designed in conformity with EN 81 Part 1 and Part 2 and prEN 81 Part 5, Part 6 and Part 7 and provided with additional protection, controls and signals.

NOTE The firefighters lift is to be used under the direct control of the fire service, in the event of fire.

**5.2.2** A firefighters lift shall serve every floor of the building.



**5.2.3** The size of the firefighters lift shall preferably be selected from ISO 4190-1. At no time shall the size be less than 1100 mm wide by 1400 mm deep with a rated load of 630 kg as described in ISO 4190-1, see also 0.5.

The minimum clear entrance width to the car shall be 800 mm.

Where the intended use is to include evacuation, to accommodate such items as a stretcher or bed or designed as a dual entry firefighters lift, then the minimum rated load shall be 1000 kg and the dimensions of the car 1100 mm wide by 2100 mm deep as defined in ISO 4190-1, see also 0.5.

**5.2.4** The firefighters lift shall reach the furthest floor from the fire service access level within 60 seconds, see also 0.5 from after the closing of the lift doors.

### **5.3 Protection of electrical equipment against water**

**5.3.1** Electrical equipment within the firefighters lift well and on the car, located within 1,0 m of any wall containing a landing door, shall be protected from dripping and splashing water or provided with enclosures classified to at least IPX3 according to EN 60529 (annex D normative).

**5.3.2** Any electrical equipment which is located less than 1.0m above the lift pit floor shall be protected to IP67. Deviating from the requirements of 5.7.3.4 and 5.9 of EN 81 Part 1 and EN 81 Part 2, the socket outlet and lowest lamp shall also be located at least 0.5m above the highest permissible water level in the pit.

**5.3.3** Equipment in machinery spaces outside of the well and in the lift pit shall be protected from malfunction caused by water.

**5.3.4** Suitable means shall be provided in the lift pit to ensure that water will not rise above the level of the fully compressed car buffer.

**5.3.5** Means shall be provided to prevent the water level in the pit from reaching equipment which could create a malfunction of the firefighters lift.

### **5.4 Rescue of trapped firefighters in the lift car**

See annex G (informative) for examples of Rescue Concept, see also 0.5.

#### **5.4.1 Rescue from outside the car**

Means of rescue such as:

- a) fixed ladders in accordance with 6.2.2 b), c) and e) of EN 81-1 and EN 81-2, located within 0.75m from the sill of the landing entrance above;
- b) portable ladders;
- c) rope ladders;
- d) safety rope systems;

can be used.

NOTE However, all such means come under the responsibility of the Local Authorities and not the lift manufacturer.

Safe fixing points for the rescue means must be provided in the vicinity of each landing.

The means must allow the car roof to be safely reached whatever the distance of the car roof is from the landing sill.

#### **5.4.2 Self rescue from inside the car**

Access shall be provided to enable full opening the trap door from inside the lift car, for example by the provision of adequate stepping points within the car, with a maximum step rise of 0,4m. Any stepping point shall be capable of supporting a load of 1200N.

Where ladders are used they shall be in accordance with EN 131 and located such that they can be safely deployed.

The free distance between any stepping points and the verticle wall shall be at least 0,1m.

The combination of the ladder together with the size and location of the trap door shall allow a firefighter to pass through.

A simple diagram or symbol shall be provided inside the well at each landing entrance, close to the lock, clearly showing how to unlock the landing door.

**5.4.3** An emergency trap door shall be provided in the roof of the car measuring a minimum of 0,5 m x 0,7m with the exception of a 630 kg lift where the trap door shall be at least 0,4m x 0,5m.

**5.4.4** The emergency trap door shall conform to 8.12 of EN 81 Part 1 and EN 81 Part 2.

Access to the inside of the car through the trap door shall not be obstructed by a permanent fixture or lighting. Where a suspended ceiling is fitted, it shall be easily openable or removable without the use of special tools. The release point(s) shall be clearly identified from inside the car.

**5.4.5** Where a rigid ladder is provided, it shall be attached to the outside of the car for rescue purposes. An electrical safety device in conformity with 14.1.2 of EN 81 Part 1 and EN 81 Part 2 shall be provided to ensure that the lift does not move if the ladder is removed from its storage place.

**5.4.6** Where ladder is provided, its storage location shall be chosen to avoid creating a tripping hazard during normal maintenance operations.

**5.4.7** Where a ladder is provided, its minimum length shall be such that when the lift car stays flush with the landing, the landing door lock of the next upper landing level can be reached. Where it is not possible for such a ladder to be installed on the car then a permanently installed ladder fixed to the well shall be used.

### **5.5 Kept free**

### **5.6 Car doors and landing doors**

Automatically operated horizontal sliding, (coupled) car and landing doors shall be used.

### **5.7 Lift machine and associated equipment**

**5.7.1** Any compartment containing the lift machine and its associated equipment shall be provided with at least the same degree of fire protection as is given to the lift well.

**5.7.2** Wherever any machinery space is located outside of the well and outside of a fire compartment, it shall be protected with at least the same fire resistance as the fire compartment(s). Any connection between fire compartments shall be likewise protected.

### **5.8 Control Systems**

**5.8.1** A firefighters lift switch shall be located in the lobby intended to be used as the firefighters service access level. The switch shall be located within 2 m horizontally from the firefighters lift, at a height between 1,8 m and 2,1 m above floor level. It shall be marked with a firefighters lift pictogram in accordance with annex F (normative).

**5.8.2** Operation of the firefighters lift switch shall be by means of a triangular key, as in annex B of EN 81 Part 1 and Part 2. The operating positions of the switch shall be bi-stable and clearly marked '1' and '0'. In position '1' Firefighters service is initiated.

This service has two phases; for the function of Phase 1 see 5.8.7 and for Phase 2 see 5.8.8.

An additional external input may be used only to automatically return the firefighters lift to the fire service access level (see clause 0.5) and keep the firefighters lift at that level with open doors. The firefighters lift switch must still be operated to the '1' position to complete the Phase 1 operation.

**5.8.3** On operation of the firefighters lift switch, all lift safety devices (electrical and mechanical) shall remain operative apart from the door reversal devices mentioned under Phases 1 and 2 5.8.7c) and 5.8.8 f).

**5.8.4** The firefighters lift switch shall not override the inspection control (EN.81: Part 1 and EN 81 Part 2 - clause 14.2.1.3), the stop switches (EN 81: Parts 1 and 2 - clause 14.2.2) or emergency electrical operation (EN 81: Part 1 - clause 14.2.1.4).

**5.8.5** When on firefighters service the function of the lift shall not be affected by an electrical malfunction of the landing call control or other parts of the lift control system located outside of the lift well.

No electrical fault on any other lift in the same group as the firefighters lift shall affect the operation of the firefighters lift.

**5.8.6** To ensure that the firefighters are not unduly delayed from obtaining control of the lift, it shall be provided with an audible signal which sounds in the car, when the actual door dwell time exceeds 2 minutes. After this time the doors will attempt to close under reduced power and the audible signal cancelled when the doors are fully closed. The sound level of the audible warning shall be adjustable between 35 and 65 dB(A), set at 55 dB(A), and shall be distinguishable from other audible lift warnings.

### **5.8.7 Phase 1: Priority recall for the firefighters lift**

This phase can be manually or automatically initiated.

This initiation shall ensure the following:

- a) all landing controls and the controls in the firefighters lift car shall be rendered inoperative and all existing registered calls cancelled;
- b) the door open and emergency alarm buttons shall remain operative;
- c) car door reversal devices for all lift landing doors and all car doors of the firefighters lift that may be affected by smoke or heat, so as to prevent closure, shall be rendered inoperative;
- d) the firefighters lift must function independently from all other lifts in a common group;
- e) on arriving at the fire service access level the firefighters lift, shall be retained there with the car and landing doors kept in the open position;
- f) the fire service communication system as described in 5.12 shall be operative;
- g) the audible signal called for in 5.8.6 shall sound on initiation of Phase 1, when the lift is under inspection control. Where provided, the intercom system described in 14.2.3.4 of EN 81: Part 1 and EN 81 Part 2 shall be activated. The signal shall be cancelled when the firefighters lift is removed from 'Inspection Control';
- h) a firefighters lift travelling away from the fire service access level shall make a normal stop at the nearest possible floor, without opening its doors and return to the fire service access level;
- i) the well and machine room lighting shall be automatically illuminated upon initiation of the firefighters lift switch.

### **5.8.8 Phase 2: Use of the lift under firefighters control**

After the firefighters lift has parked at the fire service access level with the doors open, control will be entirely from the firefighters car control panel and the following shall be ensured:

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- a) where Phase 1 has been initiated by an external signal the firefighters lift shall not operate until the firefighters lift switch has been operated;
- b) it shall not be possible to register more than one car call simultaneously;
- c) whilst the car is in motion, it shall be possible to register a new call from within the car. The previous call will be cancelled. The car shall travel in the shortest time to the new registered floor;
- d) registration of a call shall cause the lift car to travel to, and stop with the doors remaining closed at, the selected floor;
- e) if the car is stationary at a landing, it shall be possible to control the opening of the doors only by the application of constant pressure on the 'door open' car button. If the 'door open' car button is released before the doors are fully open, the doors shall automatically re-close. When the doors are fully open, they shall remain open until a new call is registered on the car control panel;
- f) the car door reversal devices and the door open button, (except that defined in 5.8.7c) ,shall remain operative as in Phase 1;
- g) the firefighters lift shall be returned to the fire service access level by switching the firefighters lift switch from '1' to '0' (for a maximum of 5 seconds) and back to '1' to repeat Phase 1. This does not apply where a firefighters lift switch is provided in the car as described in h) below;
- h) where an additional firefighters car key switch is provided, it shall be marked with a pictogram and the '0' and '1' positions shall be clearly indicated. The key shall only be removable in the '0' position.

The operation of the key switch shall be as follows:

- 1) when the lift is under firefighting control from the switch at the fire service access level, the key switch in the car must be switched to the '1' position in order to initiate car movement;
  - 2) when the lift is at another floor and not at the fire service access level and the key switch in the car is turned to the '0' position, further car movement is prevented and the doors will remain open;
- i) the registered car call shall be visually displayed on the car control panel;
  - j) the position of the car shall always be shown, both in the car and at the fire service access level;
  - k) the lift shall remain at its destination landing until a further car call is registered;
  - l) the fire service communication system as defined in 5.12 shall remain operative during Phase 2;
  - m) when the firefighters switches are returned to the '0' position the firefighters lift control system shall only revert to normal service when the lift has been returned to the fire service access level.

**5.8.9** Where a firefighters lift has dual entry and the protected firefighters lift lobbies are all located on the same side as that of the fire service access level, the following additional requirements shall be followed:

- a) there shall be control panels in the car, adjacent to both the front and rear car doors. One of these control panels is for normal use by passengers. The firefighters control panel adjacent to a protected lobby (see annex B informative) is for firefighters use only and shall be marked with the Firefighters Lift pictogram (annex F normative).

NOTE prEN 81-70 does not apply to this firefighters lift control panel;

- b) the buttons of the panel for normal use by passengers are shall be made inoperative, except for the door open and alarm buttons, when operation of the firefighters lift switch activates Phase 1;
- c) the firefighters control panel adjacent to a protected firefighters lift lobby is activated on initiation of Phase 2;
- d) landing doors that are not intended to be used by firefighters shall remain closed at all levels until the lift is returned to normal operation;

- e) landing doors to the protected firefighters lift lobbies shall be brought into operation at all levels until the lift is returned to normal operation.

## 5.9 Power supplies for firefighters lifts

**5.9.1** The power supply system of the lift and lighting shall consist of primary and secondary (emergency, stand-by or alternative) supplies. The level of fire protection shall be at least equal to that given to the lift well (see annex C informative).

**5.9.2** The secondary power supply shall be sufficient to run the firefighters lift at the rated load and to satisfy the time requirement referred to in 5.2.4.

## 5.10 Changeover of electrical supplies

The following are applicable:

- a) a correction run shall not be necessary;
- b) when the power supply is re-established the lift shall become available for service. If the lift needs to move to establish its position, it shall not move more than two stories and towards the fire service access level and indicate its position.

## 5.11 Car and landing controls

**5.11.1** The car and landing controls and associated control system shall not register false signals from the effects of heat, smoke or moisture.

**5.11.2** The car and landing controls and landing indicator panels shall be protected to at least IP33 according to EN 60529.

**5.11.3** Whilst on Phase 2 control, operation of the firefighters lift shall be by means of a full set of push buttons in the car. Other operating systems shall be rendered inoperative.

**5.11.4** In addition to the normal floor level markings in the lift car, there shall be a clear indication of the fire service access level on or adjacent to the car button for the fire access level, using the pictogram shown in annex F (normative).

## 5.12 Fire service communication system

**5.12.1** A firefighters lift shall have an intercom system or similar device for two way speech communication, utilising a full duplex system, active whilst the firefighters lift is in Phases 1 and 2, between the firefighters lift car and:

- a) the fire service access level; and
- b) the firefighters lift machine room or in the case of machine roomless lifts at the emergency operation panel(s) as defined in Amendment 2 of EN 81Part 1 and EN 81Part 2. Where a machine room is provided the microphone is only made active by pressing a control button on its unit.

**5.12.2** The communication equipment within the lift car and at the fire service access level shall be a built-in microphone and speaker, and not a telephone handset.

**5.12.3** The wiring for the communication system shall be contained within the lift well.

## 5.13 Vandal prone areas

Where a firefighters lift is installed in a vandal prone area/building, then the requirements of prEN81:Part 71 shall also apply.

## 6 Verification of the safety requirements and/or protective measures

Safety requirements and measures of clauses 5 and 7 of this standard shall be verified according to the Table 3.

**Table 3 — Verification table**

Subclause	Visual inspection <sup>1</sup>	Compliance with the lift design <sup>2</sup>	Measurement <sup>3</sup>	Design document check <sup>4</sup>	Functional Test <sup>5</sup>
5.2.1	See EN 81-1, EN 81-2, prEN 81-5, prEN 81-6, prEN 81-7				
5.2.2					
5.2.3					
5.2.4					
5.3.1					
5.3.2					
5.3.3					
5.3.4					
5.3.5					
5.4					
5.6					
5.7					
5.8.1					
5.8.2					
5.8.3					
5.8.4					
5.8.5					
5.8.6					
5.8.7					
5.8.8 a,b,c,d,e,f					
5.8.8 g					
5.8.8 h					
5.8.8 i,j,k,l,m					
5.8.9					
5.10					
5.11.1					
5.11.2					
5.11.3					
5.11.4					
5.12					
7					

<sup>1</sup> The results of the visual inspections is only to show that something is present (e.g. a marking, a control panel, an instruction handbook) , that the marking required satisfies the requirement and that the content of the documents delivered to the owner is in accordance with the requirements.

<sup>2</sup> The results of the compliance with the lift design is to prove that the lift is built according to the design and that the components/devices comply with the design documents.

<sup>3</sup> The result of the measurement is to show that the stated measurable parameters have been met.

<sup>4</sup> The result of the design document check is to prove that the design requirements of the standard have been matched “ on paper” in the design documentation (e.g. layout, specification).

<sup>5</sup> The result of the functional test is to show that the lift works as intended, including the safety devices.

NOTE Where the Installer uses a type examined product the test and inspections will be as defined in the product documentation.

## 7 Information for use

The following information shall be provided.

**7.1** A firefighters lift, unlike a normal lift, shall be designed to operate so long as is practicable when there is a fire in parts of the building. The lift may be used as a passenger lift when there is not a fire. To reduce the risk of the entrance being obstructed when the lift is required to operate on firefighters service, its use for moving refuse or goods should be restricted.

**7.2** It is the lift installer who shall provide instructions to the owner, which includes details according to the Table 4 below:

**Table 4 — Information for use**

Clause	Information
5.1	Environment/Building requirements (e.g. operating temperatures, significant hazards not addressed)
5.2	Fundamental firefighters lift requirements (e.g. size of car and use)
5.4	Rescue of trapped firefighters in the lift car (e.g. rescue concepts. For examples see 7.3 and 7.4 )
5.8	Control systems (e.g. description of functions)
5.9	Power supplies for firefighters lifts (e.g. owner's responsibility to maintain)
5.10	Changeover of electrical supplies (e.g. owner's responsibility to maintain)
5.12	Fire service communication system (e.g. periodic testing)

### 7.3 External rescue procedure

- a) the firefighter open the landing door above the stopped car and enters onto the car roof;
- b) the firefighter on the car roof opens the trap door, pulls out the ladder stored on the car and places it into the car;
- c) the trapped persons climbs the ladder;
- d) the firefighter and the trapped person escape through the open landing door, if necessary by using the ladder.

### 7.4 Self rescue procedure

- a) the trapped firefighter opens the trap door;
- b) the trapped firefighter climbs to the car roof, using either stepping points in the car or a ladder stored in a cabinet in the car;
- c) the trapped firefighter uses (if necessary) the ladder to release the landing door lock from the inside and escapes.

## **Annex A** (informative)

### **Firefighting concept for high rise buildings**

This concept does not cover the means of escape using other means, such as emergency staircases etc.

#### **A.1 Introduction**

The building construction, smoke detection, alarm systems, fire extinguishing installation, hydrants etc. are subject to National Building Regulations.

Generally, the Fire Service meaning of the term 'high rise' applies to those buildings with floors above the reach of the Fire Service Equipment.

Fires in high rise buildings are not new. Possibly, the first recorded fire happened in 1908 when the 12 storey 'Parker' building in New York was involved in fire on all floors. In 1911, 148 people were killed by fire at the 10 floor 'Shirt Waister' factory. In 1916, as a result of these and other similar fires, New York City Council revised its building codes to provide such features as protected staircases, fire mains, lifts and sprinklers.

The increasing development of the high rise era has presented architects and fire services with two well defined issues, the first being to design buildings which will resist fire and smoke spread and provide a high degree of safety for the occupants. The other to incorporate into these same buildings fixed firefighting facilities and rescue arrangements that are both effective and practical.

Firefighters lifts, the number of which and their location within the building are determined by national Regulations and are an important tool for fire attack, transporting firefighters and equipment and for evacuation under control of the firefighters.

#### **A.2 Background**

When the Fire Service is called to a fire, a rapid response is expected of it. Considerable financial resources have been committed to providing a fast, efficient service which is fundamental to ensuring an effective firefighting and rescue. However, the time taken to reach the entrance of a building may be but a fraction of the time it takes to travel through the building to reach the fire and start firefighting or rescue operations.

Fire Service personnel faced with the task of firefighting on a floor high above the ground need to be able to reach the fire quickly and safely, taking with them their equipment. Physical safety and lives, their own and the occupants of the building, as well as the preservation of the building and its contents, may well be put at risk by delay. On reaching the fire, firefighters must have sufficient energy left for the arduous and prolonged task of firefighting.

The emergency services are therefore dependent on the foresight of designers in providing them with the necessary facilities to operate effectively within the building once they have arrived. This means that in high rise premises the provision of a firefighters lift is essential. A firefighters lift needs to be readily available and of suitable design for the use of firefighters and remain in use for as long as possible during firefighting operations. It is recognised that it is neither technically nor economically viable to design and provide a lift which is ensured never to fail. However, designers and installers need to be aware that the Fire Service is operationally highly reliant on the use of the lift.

In a fire the hazards for passengers who may become trapped in the lift car should it fail are so great that lifts (other than lifts specifically intended for evacuation use) should not be used as a means of escape. The building evacuation plans should be based on the use of the stairs.

The design principle of providing fire protection to lift wells, staircases, protected lobbies and lift machine rooms is a long established practice which needs to be considered as an essential and integral part of the provision of a firefighters lift.



### A.3 Fire service operations

(See Figure A1).

It is normal Fire Service practice on arrival at the Fire Service access level to take control of the firefighting lift. Having secured the use of the firefighters lift, firefighters use it to transport their equipment to a floor below that of the fire to form a bridge-head (forward control point). This approach avoids both Fire Service personnel and the lift car being directly exposed to the risk of injury or damage before the fire situation can be assessed and firefighting started.

The officer in charge of the forward control point is responsible for executing a plan of attack. Firefighting operations will be launched from a protected area which is free from smoke. Crews committed from the forward control point to attack the fire should always attempt to take uncharged hose lines to the fire floor and connect to the water supply at that level. This procedure will help to ensure the stair risers remains free from hose lines and smoke. Only if the firefighting conditions on the fire floor become untenable should a hose be connected to the riser outlet on a lower floor.

The firefighters lift will continue to be used to transport equipment and personnel throughout the incident.

Firefighting is by its very nature usually involves using substantial quantities of water and it is therefore essential that the lift installation is designed to provide protection to electrical equipment from this danger.

The recall of the firefighters lift may be automatic if it is linked to a fire alarm system as defined in prEN81-73. However, in this event the firefighters lift will park at the fire service access level until the firefighting lift switch is operated.

### A.4 Firefighters lift

A firefighters lift, unlike a normal lift, shall be designed to operate so long as is practicable when there is a fire in parts of the building. The lift may be used as a passenger lift when there is not a fire. To reduce the risk of the entrance being obstructed when the lift is required to operate on firefighters service, its use for moving refuse or goods should be restricted.

Reliability of power supplies and circuitry is essential to the operation of the firefighters lift.

### A.5 Fire service rescue

(See annex G (informative)).

There is no certainty that the efforts of the Fire Service will be successful and consideration must be given to the developing fire having an effect on the operation of the lift. It is very likely that the Fire Service will continue to use the lift with deteriorating conditions within the building. It is therefore possible that, even with all the safety elements which have been provided, the lift may fail to operate with people now trapped inside the car. In these circumstances, it is highly likely that access to the lift recovery system will not be available. It is therefore essential that the lift car be provided with access so that trapped firefighters can rescue themselves or be rescued by others. There may be several ways to achieve this.

NOTE The above is only an example to illustrate the risks and different concepts which may be used in different countries.

NOTE This is only an example and different concepts may be used in different countries;

- the fire is attacked from the protected lobby;
- a bridge-head is established in the protected lobby at a lower level.

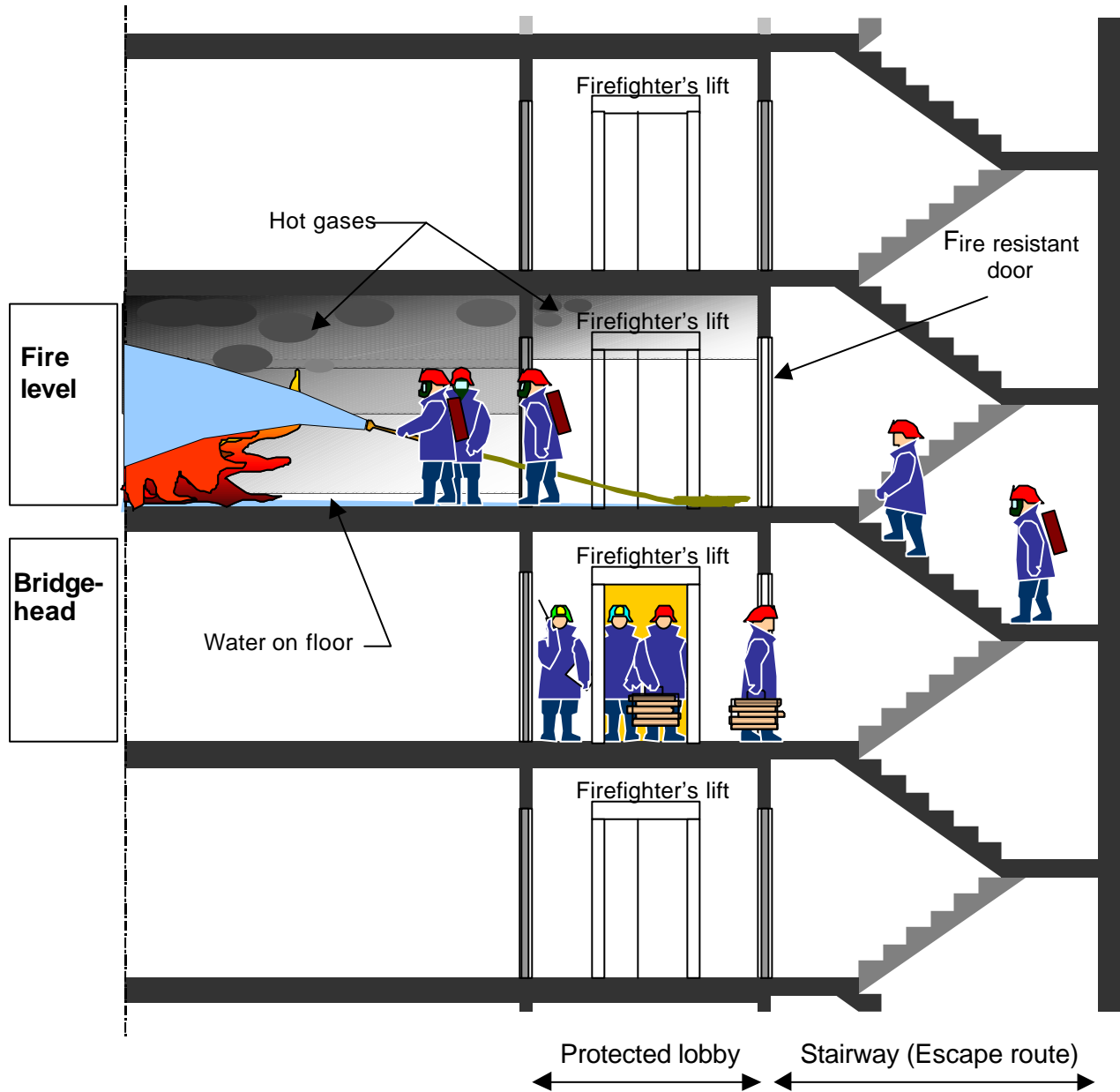
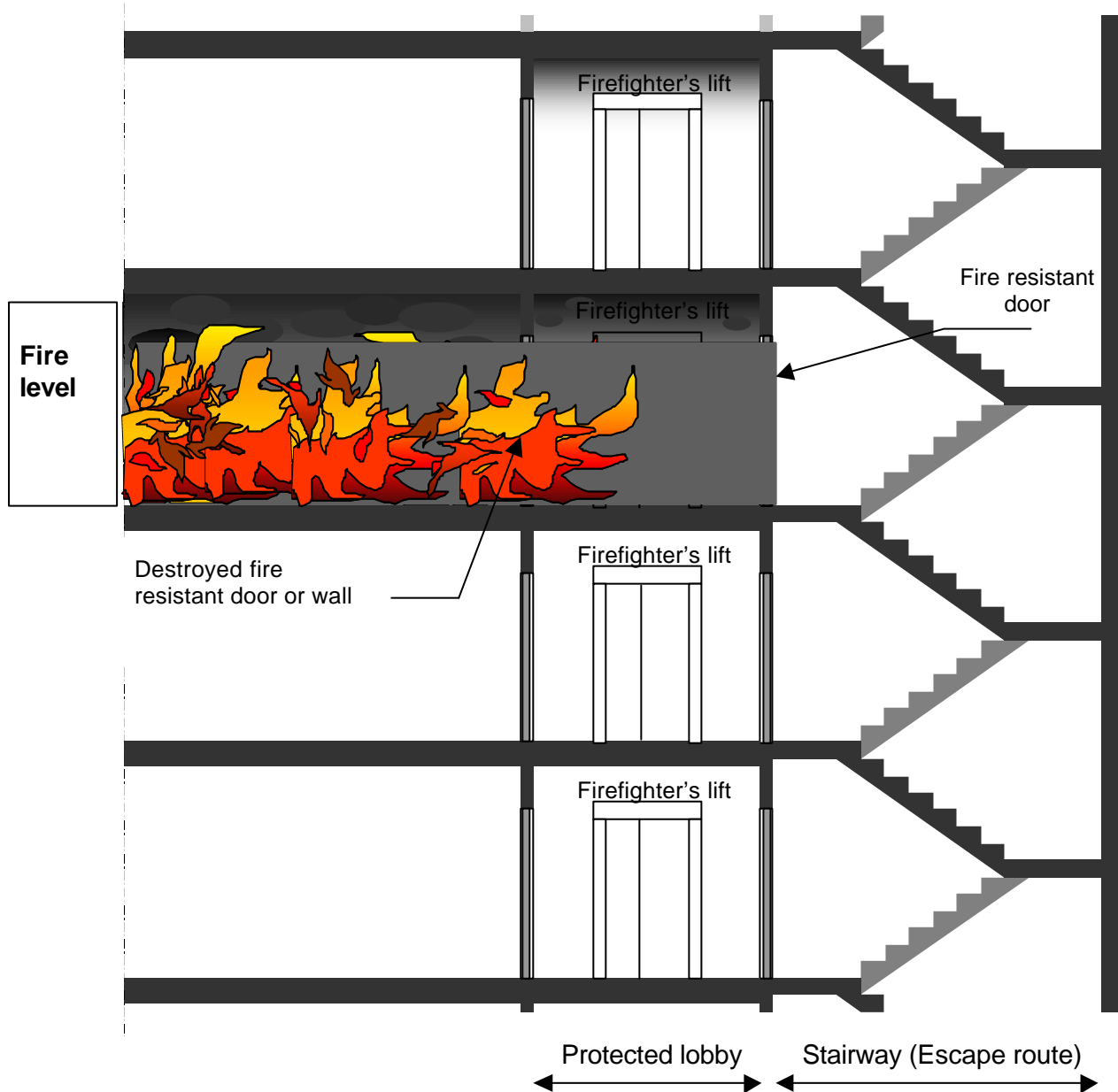


Figure A.1 — Fire adjacent to the protected lobby

NOTE This is only an example and different concepts may be used in different countries;

- the fire has eventually broken into the protected lobby after time;
- the risk is not addressed in this standard.



**Figure A.2 — A major fire in the protected lobby**

In this case, the fire has spread too far, and the operation of the firefighter's lift can no longer be guaranteed for fire fighting or rescuing purposes.

## Annex B (informative)

### Basic layouts for firefighters lift

The arrangements and fire resistance of doors and walls shall be in accordance to national fire regulations.

The requirements for fire resistance and equipment are defined in the national fire regulations by the building's:

- escape routes;
- number of storeys;
- fire load;
- automatic extinguisher installation;
- etc...

The following diagrams are only illustrative and other building configurations are possible.

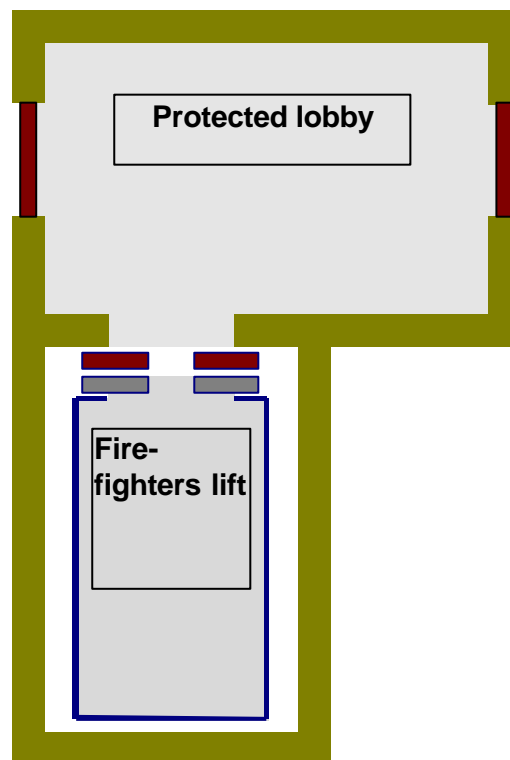


Figure B.1 — Basic layout of a single firefighters lift and protected lobby

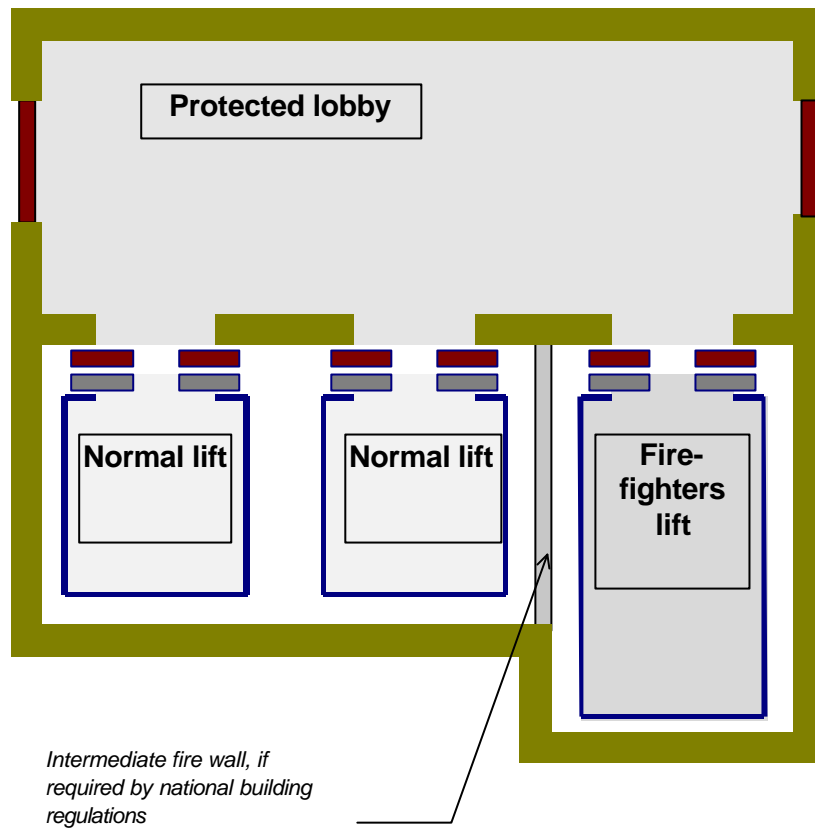


Figure B.2 — Basic layout of a firefighters lift in a multiple well and protected lobby

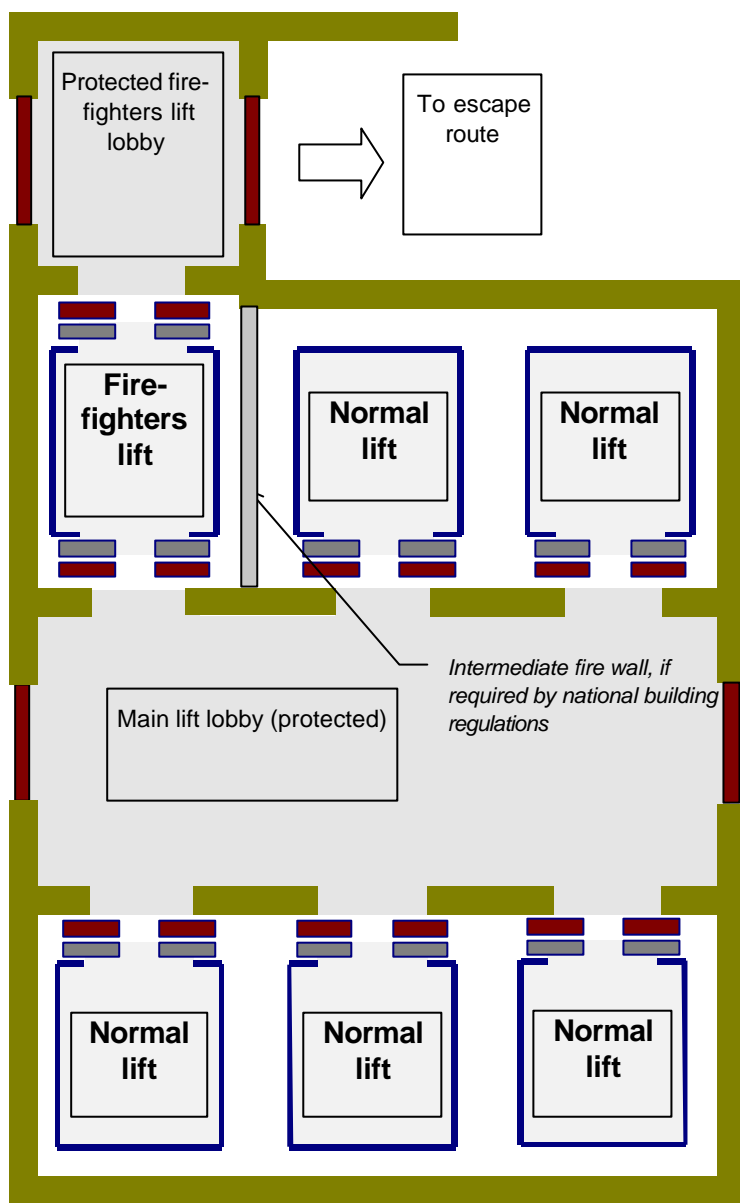
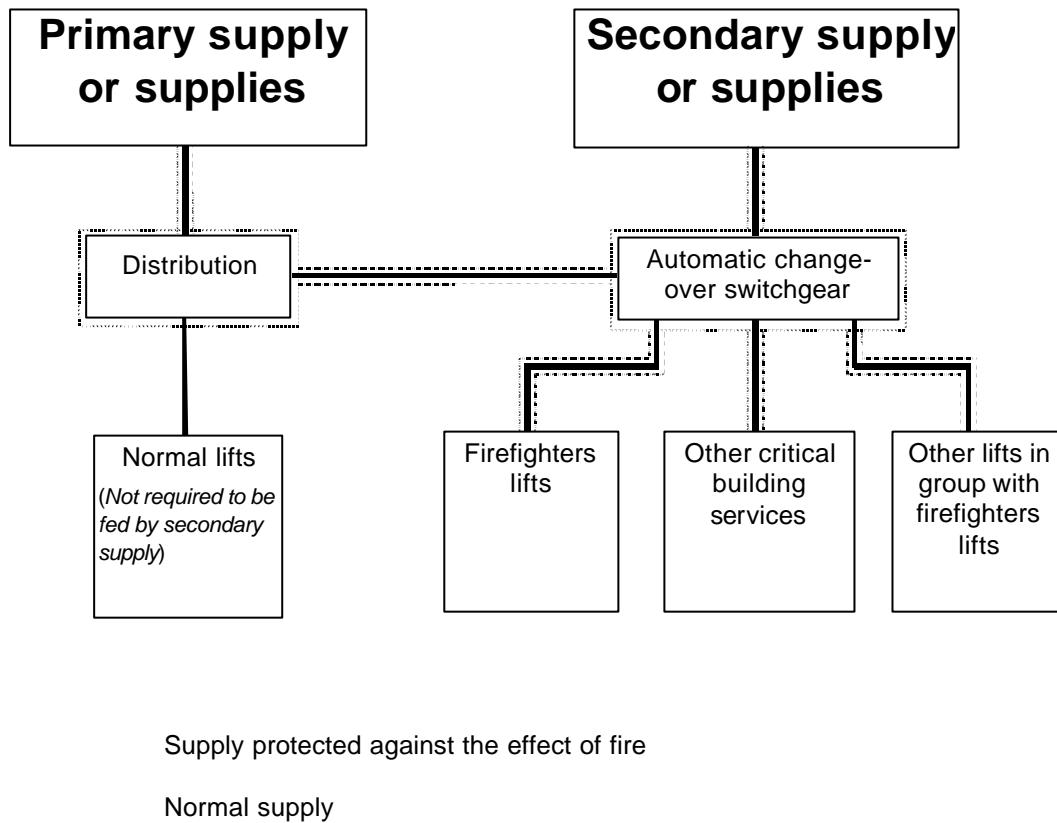


Figure B.3 — Basic layout of a dual entry firefighters lift in a multiple well and protected lobbies

## Annex C (informative)

### Power supplies for firefighters lifts



**Figure C.1 — Example of power supplies for firefighters lifts**

### Annex D (normative)

### Water protection in the lift well

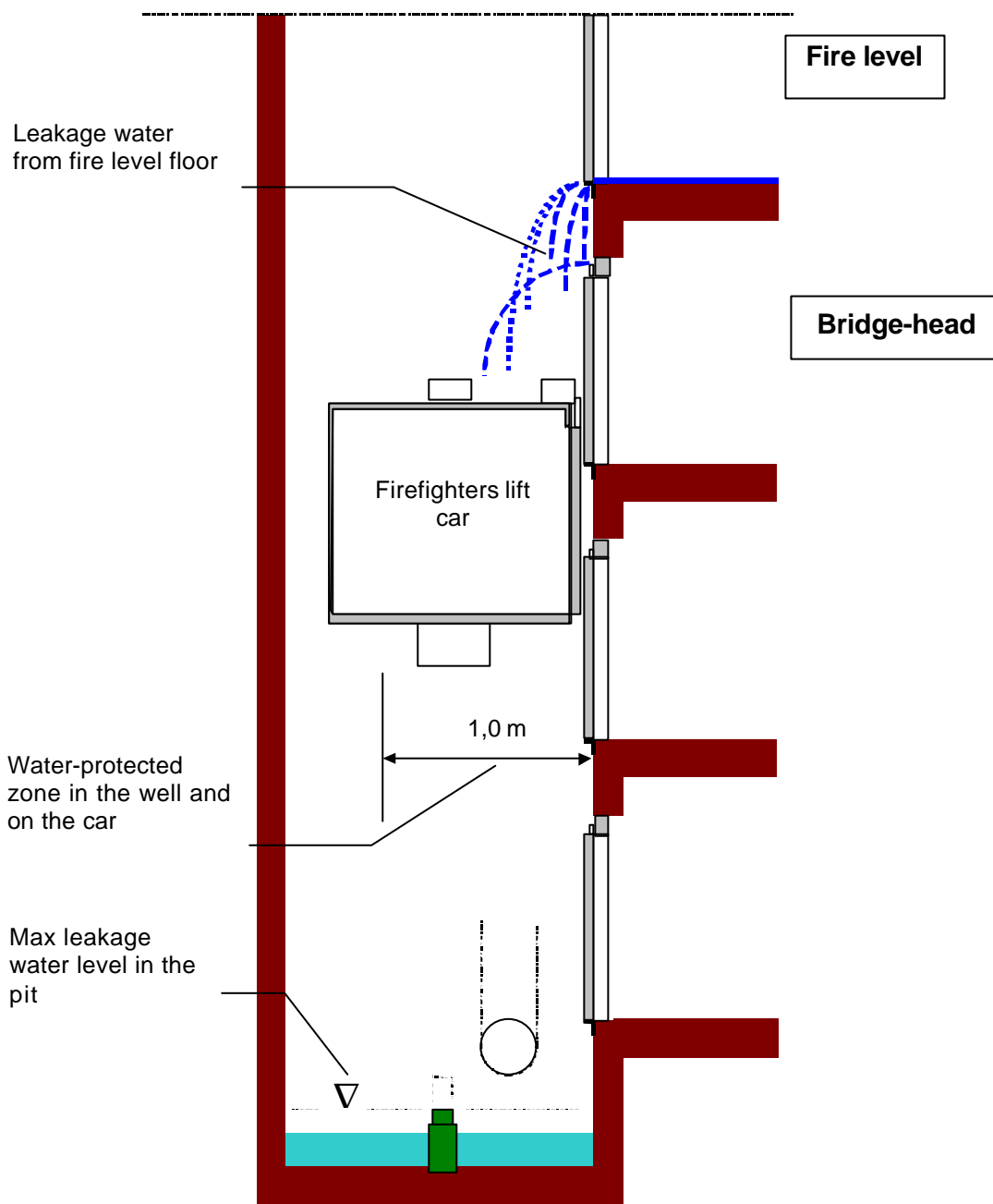
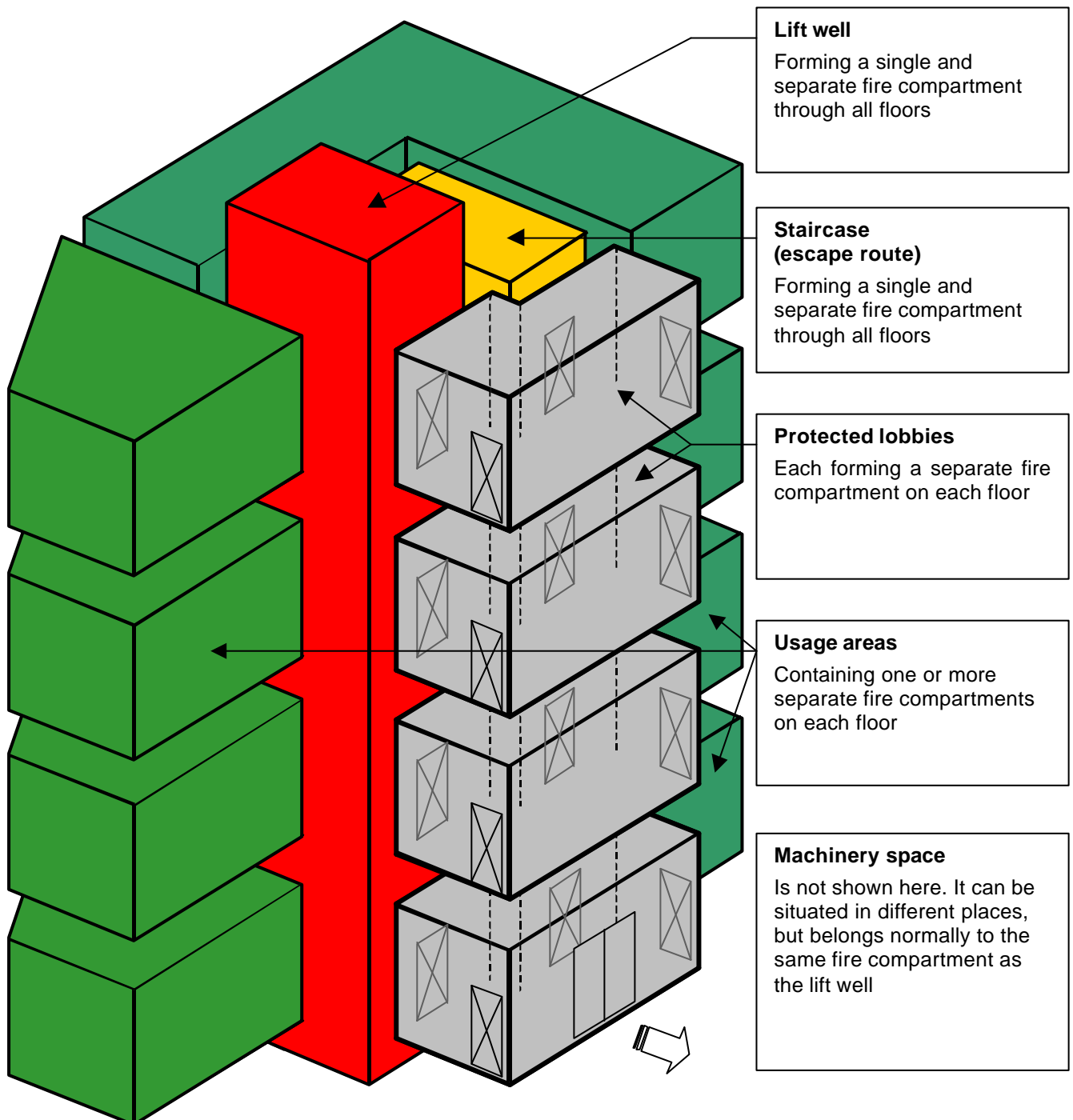


Figure D.1 — Protection of electrical equipment against water



## Annex E (informative)

### Concepts of fire compartments



The usage areas will be connected to the firefighters lift only through a protected lobby, forming a separate fire compartment.

The lift well may contain other lifts than the fire fighters lift in the same fire compartment.

Figure E.1 — Concept of fire compartments

**Annex F**  
(normative)

**Pictogram for a firefighters lift**



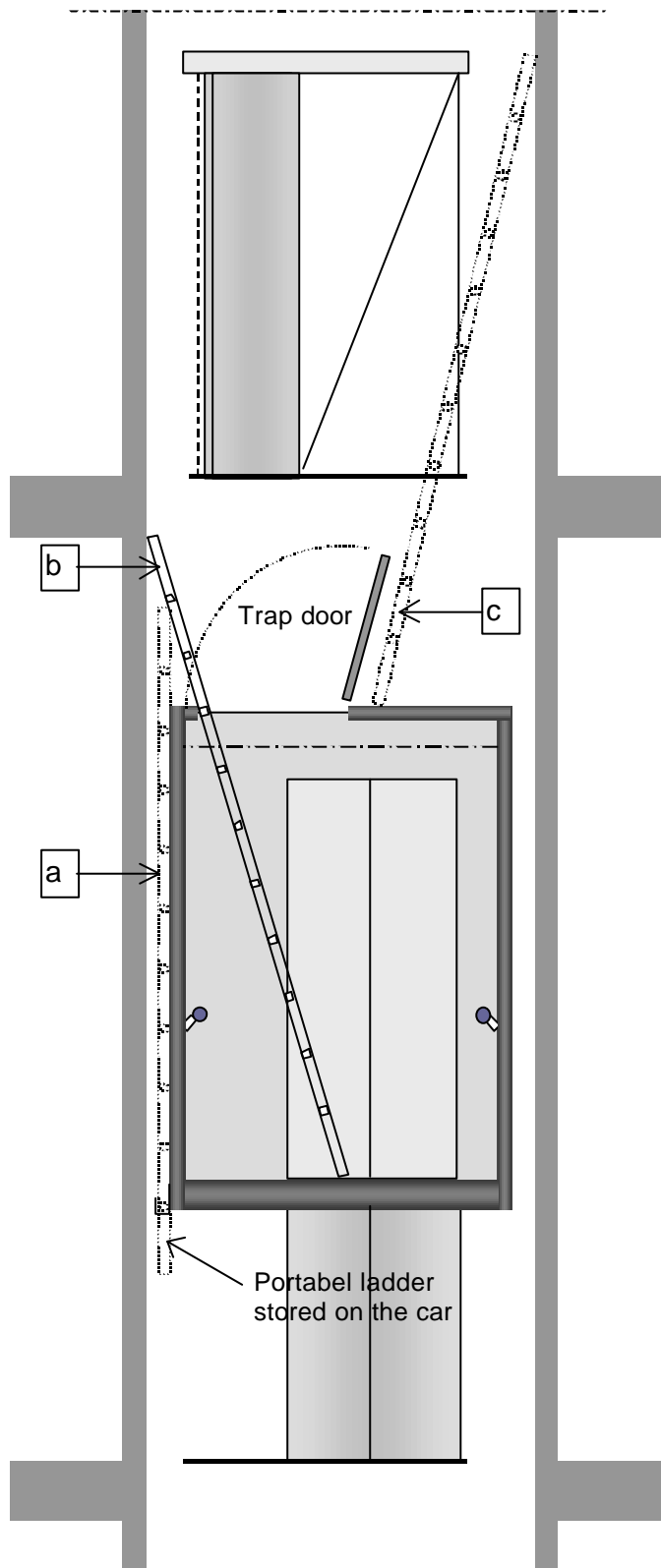
Illustration in white

Background in red.

**Figure F.1 — Pictogram for a firefighters lift**

## Annex G (informative)

### Examples of rescue concept for firefighters



#### External rescue procedure

The firefighters open the landing door above the stopped car and enter onto the car roof.

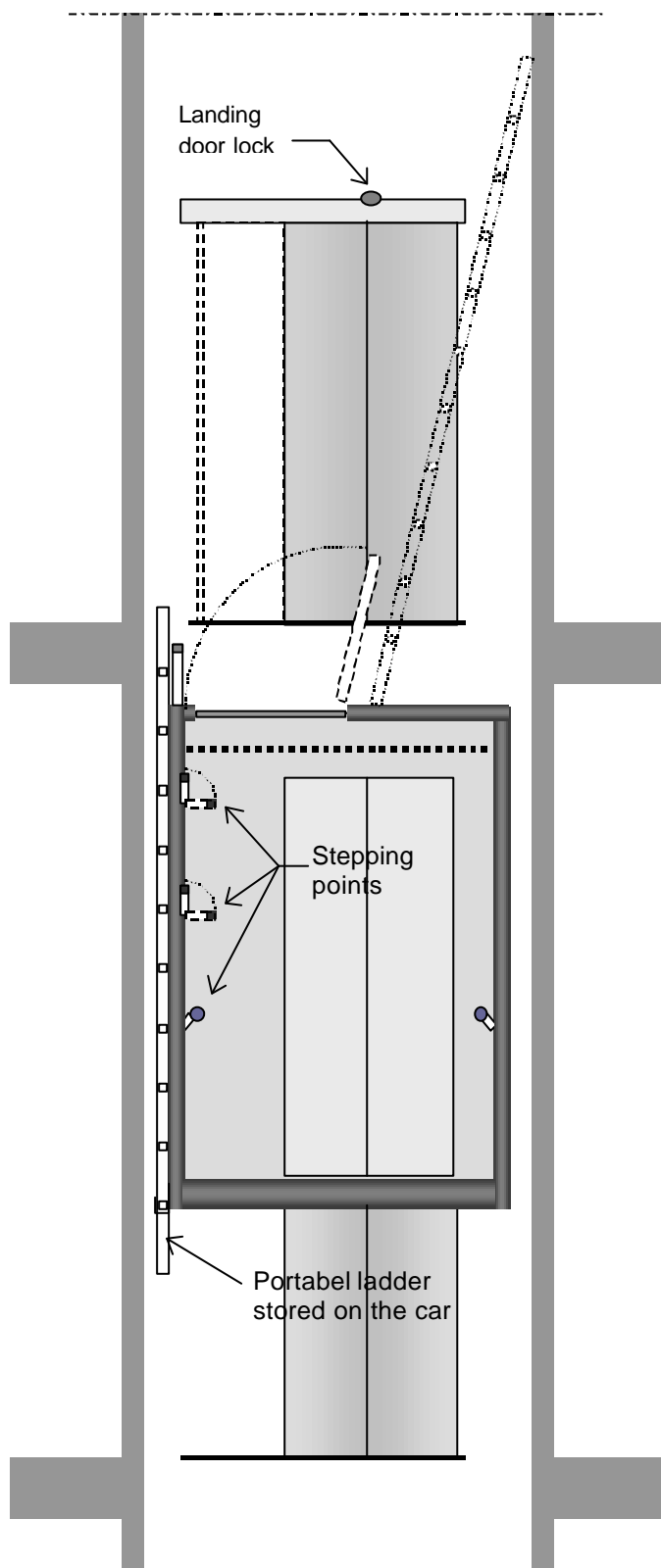
The firefighters on the car roof open the trap door, pull out the ladder stored on the car (position "a"), and place it into the car (position "b").

The trapped person climbs the ladder.

The firefighters and the trapped person escape through the open landing door, if necessary by using the ladder (position "c")

Figure G.1 — Rescue from outside the lift, using a portable ladder stored on the car

This concept can be used only when the distance between the sills of the landing doors is compatible to the length of the ladder.



**Self rescue procedure**

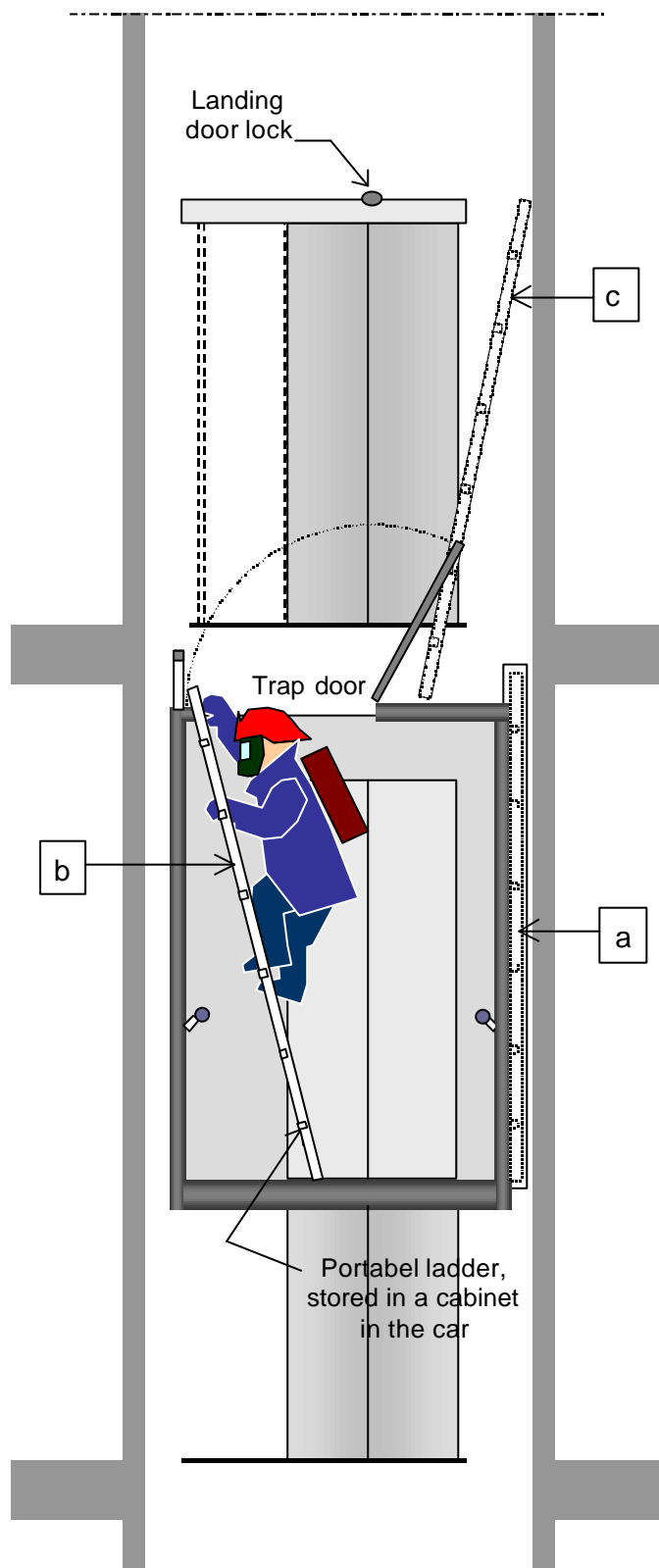
The trapped firefighter opens the trap door.

The trapped firefighter climbs to the car roof, using stepping points in the car.

The trapped firefighter uses (if necessary) the portabel ladder stored on the car to release the landing door lock from the inside, and escapes.

Figure G.2 — Self rescue using a portabel ladder stored on the car

This concept can be used only when the distance between the sills of the landing doors is compatible to the length of the ladder.



#### Self rescue procedure

The trapped firefighter opens the cabinet door and removes the ladder stored in the cabinet (position "a")

The trapped firefighter opens the trap door.

The trapped firefighter climbs to the car roof, using the ladder (position "b").

The trapped firefighter uses (if necessary) the ladder (position "c") to release the landing door lock from the inside, and escapes.

Figure G.3 — Self rescue using a portabel ladder stored in a cabinet inside the car

**Annex ZA**  
(informative)

**Clauses of this European Standard addressing essential requirements or other provisions of EU Directives**

This European standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directive:

Lift Directive 95/16/EC – with the exception of clauses 5.1 and 5.9.

WARNING: Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Compliance with this standard provides one means of conforming with the specific essential requirements of the Directive concerned and associated EFTA regulations.