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Part 2: Code of practice for application, installation and maintenance

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Introduction

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For international and European standards, comments will be reviewed by the relevant UK national committee before submitting the consensus UK vote and comments. If the draft standard is approved, it is usual for the resulting published standard to be adopted as a British Standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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**BS 8524-2:2023, Active fire curtain barrier assemblies – Part 2:
Code of practice for application, installation and maintenance**

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Contents

Foreword	3
0	Introduction 5
1	Scope 7
2	Normative references 7
3	Terms and definitions 8
4	Specifying barrier assemblies 9
5	System design 10
<i>Table 1 – Performance criteria for barrier assemblies 11</i>	
<i>Table 2 – Selection of deployment initiation method 12</i>	
<i>Table 3 – Selection of deployment method 14</i>	
<i>Table 4 – Provision of emergency access/egress controls 16</i>	
<i>Figure 1 – Example of overlapping barrier assemblies on protected routes 18</i>	
<i>Table 5 – Radiation tenability at 15 min 19</i>	
6	Installation 21
<i>Figure 2 – Clear areas for barrier deployment 22</i>	
<i>Figure 3 – Typical example of how to protect side retention guides 24</i>	
7	Commissioning 24
8	Inspection, testing and maintenance 26
<i>Table 6 – Inspection and testing of barrier assemblies 27</i>	
Annex A (informative) Typical approving authority pre-installation checklist 28	
<i>Figure A.1 – Example of a typical approving authority pre-installation checklist 28</i>	
Annex B (informative) An engineered approach to using radiative heat flux for tenable conditions for single-level horizontal routes 29	
<i>Table B.1 – Permitted radiation performance, $R_{max}^{A)}$ 30</i>	
<i>Table B.2 – Permitted radiation performance, $R_{max}^{A)}$ 32</i>	
<i>Figure B.1 – Radiative heat flux process 34</i>	
Annex C (informative) Determining the fire resistance of barrier assemblies 39	
Annex D (informative) Typical installation checklist 40	
<i>Figure D.1 – Example of a typical installation checklist 40</i>	
Annex E (informative) Model installation certificate 42	
<i>Figure E.1 – Model installation certificate 42</i>	
Annex F (informative) Typical inspection checklist 44	
<i>Figure F.1 – Example of a typical inspection checklist 44</i>	
Annex G (informative) Model commissioning certificate 45	
<i>Figure G.1 – Model commissioning certificate 45</i>	
Annex H (informative) Model completion certificate 47	
<i>Figure H.1 – Model completion certificate 47</i>	
Annex I (informative) Model servicing certificate 50	
<i>Figure I.1 – Model servicing certificate 50</i>	
Bibliography 52	

Foreword

Publishing information

This part of BS 8524 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on XXX 2023. It was prepared by Technical Committee FSH/25, *Smoke, heat control systems and components*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

This British Standard/part of BS 8524 supersedes BS 8524-2:2013, which is withdrawn.

Relationship with other publications

This British Standard is published in two parts:

- Part 1: *Specification*;
- Part 2: *Code of practice for application, installation and maintenance*.

Information about this document

This is a full revision of the standard made necessary by the publication of BS 8524-1:2023, which also brings the standard up to date in accordance with current regulations.

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It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Assessed capability. Users of this British Standard are advised to consider the desirability of sourcing active fire curtain barrier assemblies from suppliers who operate quality systems that have been assessed and registered against the appropriate standard in the BS EN ISO 9000 series by an accredited third-party certification body.

Installation and maintenance. Users of this British Standard are advised to consider the desirability of third-party certification of installers and maintainers of active fire curtain barrier assemblies. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

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0 Introduction

0.1 Role and use of barrier assemblies

As fire-separating elements, barrier assemblies are required to provide two main functions:

- a) to maintain any compartmentation of buildings needed to limit the spread of fire and smoke;
- b) to allow access to protected escape routes, both vertical and horizontal, without any loss of fire resistance, and to limit smoke entry into these routes, i.e. protected corridors and protected shafts.

They can also be partially deployed to control the movement of fire effluent within buildings in the event of fire, prior to being fully deployed as a fire barrier.

Recommended positions and ratings for fire-separating elements for means of escape purposes are given in BS 9999:2017, BS 9991:2021 and BS 7974. The recommendations in BS 9999 and BS 9991 use a risk-based approach; those in BS 7974 are based on the principles of fire safety engineering.

When used as part of a fire-engineered design solution, barrier assemblies can become a critical element of that design. If barrier assemblies do not deploy to their operational position, the fire-engineered solution would be compromised. However, in the event that other fire protection systems or elements do not function, e.g. due to total power failure, the barriers in the fire-operational position will provide fire separation.

0.2 Application of barrier assemblies

Barrier assemblies used in life safety and property protection applications can be horizontal, vertical or angled. Depending upon the application, they could be used to replace fire doors, roller shutters, non-load-bearing walls, non-load-bearing ceilings, glazed elements, etc. They could also be used to form fire separation, e.g. forming protected routes or lobbies. They can provide some of the functionality of a fire door, but when used only for fire and smoke control, as a fire door, then different requirements apply. These requirements are given in . Barrier assemblies can enable greater barrier widths and barrier movements using less space than other traditional methods.

It is essential that any proposed use of barrier assemblies is assessed in the context of the building use and perceived occupancy to ensure that it is ultimately suitable for the intended use, taking into consideration such factors as:

- a) fire resistance;
- b) reaction to fire;
- c) smoke leakage;
- d) occupancy type and risk profile;
- e) occupancy load;
- f) means of escape for egress;
- g) ingress for fire and rescue service;
- h) life safety and property protection objectives.

0.3 Heat transfer through barrier assemblies

In fire safety situations, it is often important to establish the heat transfer from one side of the separating element to the other in order to calculate escape route sizes and safe operating distances. This is usually established using insulation data. Due to the difficulty of measuring insulation on some barrier assemblies, guidance on the use of radiation data as an alternative is given in this standard.

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NOTE National building regulations ([1] to [3]) only apply to life safety. Higher performance levels might be necessary for certain applications if property protection is required.

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1 Scope

This part of BS 8524 gives recommendations for the application, installation and maintenance of active fire curtain barrier assemblies. It is applicable only to active fire curtain barrier assemblies conforming to BS 8524-1:2023 that are designed to provide fire resistance or fire and smoke resistance.

NOTE Smoke barriers, used solely for smoke control, are covered by BS EN 12101-1. Such smoke barriers are not considered to be active fire curtain barrier assemblies within the scope of BS 8524.

This part of BS 8524 is also intended to provide guidance and recommendations for designers, specifiers (e.g. architects, fire engineers), approving authorities, installers and maintainers for the following:

- a) creating compartmentation;
- b) creating protected routes for the purpose of means of escape;
- c) providing protection at the location of non-fire-resisting elements, e.g. in front of non-fire-resisting glazing and doorsets, where required for compartmentation or protecting means of escape;
- d) providing a fire- and smoke-resistant barrier in conjunction with non-smoke rated products protecting openings to reduce leakage of smoke.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5839-1:2017, *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*

BS 5839-6:2019+A1:2020, *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*

BS 8519, *Selection and installation of fire-resistant power and control cable systems for life safety fire-fighting and other critical applications – Code of practice*

BS 8524-1:2023, *Active fire curtain barrier assemblies – Part 1: Specification*

BS 9991:2021, *Fire safety in the design, management and use of residential buildings – Code of practice*

BS 9999:2017, *Fire safety in the design, management and use of buildings – Code of practice*

BS EN 1363-1, *Fire resistance tests – Part 1: General requirements*

BS EN 1634-3, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 3: Smoke control test for door and shutter assemblies*

BS EN 12101-10, *Smoke and heat control systems – Part 10: Power supplies*

BS EN ISO 13943, *Fire safety – Vocabulary*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

3 Terms and definitions

For the purposes of this part of BS 8524, the terms and definitions given in BS EN ISO 13943 and the following apply.

3.1 active fire curtain barrier assembly (barrier assembly)

assembly manufactured from flexible materials, not hinged or pivoted, provided for the passage of persons, air and objects, which, together with its frame as installed in a building, is intended (when closed) to resist the passage of fire

NOTE For ease of reference, the active fire curtain barrier assembly is referred to as the “barrier assembly” throughout this British Standard.

3.2 barrier assembly with smoke resistance performance

assembly manufactured from flexible materials, not hinged or pivoted, provided for the passage of persons, air or objects, which together with its frame as installed in a building is intended (when closed) to resist the passage of fire and smoke

3.3 barrier movement

travel distance of a barrier assembly from its retracted position to its fire-operational position

3.4 compartmentation

process of separating a building or part of a building, into one or more rooms, spaces or storeys, with the intention of preventing the spread of fire to or from another part of the same building or adjoining building

NOTE 1 Compartmentation is mainly implemented to assist the fire and rescue services by confining the fire within a fire-resisting enclosure. In some instances it is employed to assist means of escape in buildings where evacuation might be delayed, e.g. where phased evacuation policy has been applied in premises such as hospitals and care homes or where a policy of non-evacuation (e.g. “defend in place” or “stay put strategy”) is employed as in blocks of flats.

NOTE 2 Fire enclosures specifically for the purpose of means of escape, such as lobby protection to stairways and enclosure of special risks, are not regarded as compartments and may employ passive smoke containment measures.

3.5 competent person

person, suitably trained and qualified by knowledge and practical experience, and provided with the necessary instructions, to enable the required task(s) to be carried out correctly

3.6 deployment

movement of a barrier assembly from its retracted position to its fire-operational position

3.7 dwelling

unit of residential accommodation, occupied (whether or not as a sole or main residence):

- a) by a single person or by people living together as a family; or
- b) by not more than six residents living together as a single household, including a household where care is provided for residents

[SOURCE: BS 9999:2017, 3.17]

3.8 fire-operational position

final configuration of a barrier assembly specified by its designer to achieve and be sustained in the ultimate fire condition of the design

3.9 fire separation

method of providing an element that is intended for use in maintaining separation between two adjacent areas of a building in the event of a fire to form protected routes and/or compartmentation

3.10 fire strategy

fire safety design for a particular building determined by prescriptive codes, fire safety engineering or fire risk assessment

3.11 gravity fail-safe

ability of a barrier assembly to move to its fire-operational position in a safe and controlled manner to facilitate fire separation when all consumable primary and auxiliary power supplies are removed, in the event of wiring or system corruption, open or short circuit, or any combination thereof

3.12 life safety application

application of the barrier assembly in its fire-operational condition for the period of time required for the occupants of the premises to be alerted, and to be able to exit the premises, with the barrier assembly assisting in the protection of the means of escape and access for the fire and rescue service

3.13 means of escape

means whereby a safe route (or routes) in the event of fire is (or are) provided for persons to travel from any point in a building to a place of ultimate safety

[SOURCE: BS 9999:2017, **3.76**]

3.14 multi-positional deployment

staged movement of barrier assemblies to provide initial smoke containment prior to full fire containment

3.15 property protection application

application of the barrier assembly in its fire-operational condition to protect a building's contents and structure

3.16 side retention

retention device which links the barrier fabric to the building structure to contain fire and smoke

3.17 smoke barrier

device to channel, control and/or prevent the migration of smoke

NOTE Smoke is often referred to as "fire effluent". Smoke barriers can also be referred to as smoke curtains, smoke blinds or smoke screens. These are specified in BS EN 12101-1.

4 Specifying barrier assemblies

When specifying a barrier assembly, a full description of the barrier assembly should be provided, including the level of fire resistance required. The description should include the following:

- a) overall size (length and drop);
- b) mode of operation;
- c) details of surrounding building structure;
- d) minimum integrity time;
- e) permitted deflection zone, where applicable;
- f) radiation limit, where applicable;
- g) requirement for smoke seals, where applicable.

In dwellings, where the barrier assembly protects a means of escape, smoke seals should be fitted.

In the case of a barrier assembly, it is only the complete assembly, as described in the relevant fire test report, which should be deemed to provide the required performance.

NOTE 1 Fire resistance is a property that can be possessed only by a complete construction, and not by the individual components or materials from which the construction is formed.

NOTE 2 Further guidance is given in Association For Specialist Fire Protection Black Book:2020 [4] and Local Authority Building Control Guidance Note 2021 [5].

5 System design

COMMENTARY ON CLAUSE 5

The recommendations given in Clause 5 are intended to provide the fire engineer and/or designer with a separating element which fulfils the means of escape and compartmentation requirements relating to life safety and property protection, and maintains appropriate access for fire-fighting activities.

The building design parameters dictate the minimum classification and performance of barrier assemblies that can be used in any particular application (see 5.2.1).

5.1 Barrier assembly selection

5.1.1 General

Barrier assemblies should conform to BS 8524-1:2023.

A copy of the product summary (see Note 1) should be obtained from the manufacturer and used to check that the barrier assembly meets the selection criteria for the proposed application.

NOTE 1 See BS 8524-1:2023, Annex I, for an example of a product performance summary sheet.

NOTE 2 Users of this standard might wish to consider consulting the relevant approving authority prior to installation of the barrier assembly, in order to demonstrate that an appropriate product has been selected to fit the particular application with which it is to be used. An example of an approving authority pre-installation checklist is given in Annex A.

5.2 Selection of barrier assemblies

5.2.1 Operational performance

Barrier assemblies should be selected to meet the appropriate performance criteria given in Table 1 for the specific application. Details of the selected performance criteria should be provided by the supplier/installer.

5.2.2 Initiation of deployment

A barrier assembly should be initiated by one or more of the following methods, selected in accordance with Table 2, depending upon its application:

- a) the automatic fire alarm system of the building or individual dwelling;
- b) a separate detection system provided solely to initiate operation of fire protection systems and conforming to BS 5839-1:2017, category L5;
- c) stand-alone initiation from a local detector or fusible device;
- d) multi-positional deployment, e.g. partial descent upon operation of the building fire alarm system followed by full descent after a pre-set delay or upon operation of a local detector or fusible device.

NOTE The building fire strategy might also require a sprinkler-flow switch conforming to BS EN 12259-5 to initiate barrier assembly deployment.

5.2.3 Method of deployment

A barrier assembly should be deployed in one of the following methods, selected in accordance with Table 3, depending upon its application:

- a) immediate single deployment: barrier assembly deploys fully upon receipt of initiating signal;
- b) immediate multi-positional deployment: barrier assembly moves to predetermined height upon receipt of initiating signal for a predetermined time or until receipt of a second signal (double-knock);

- c) delayed single deployment: barrier assembly remains in place for a predetermined time before deploying fully;
- d) delayed multi-positional deployment barrier assembly remains in place for a predetermined time before moving to a predetermined height for a further predetermined time or until receipt of a second signal (double-knock).

NOTE For any barrier assembly, only one form of deployment is required unless specified otherwise in the building fire strategy.

Where multi-positional deployment is used, where a barrier assembly crosses an access/egress route, the second and any subsequent movements should be actuated via a local detector or fusible device, depending upon the building fire strategy.

Table 1 – Performance criteria for barrier assemblies

Parameter	Performance criteria for barrier assemblies forming part of protected route for means of escape purposes	Performance criteria for barrier assemblies used to provide compartmentation within the building
Fire resistance integrity (E) (BS 8524-1:2023, 5.6.2)	Should be in accordance with BS 9999:2017, 31.2 or BS 9991:2021, 27.2 .	Should be in accordance with BS 9999:2017, 31.2 or BS 9991:2011, 27.2 .
Fire resistance insulation (I) (BS 8524-1:2023, 5.6.3)	Should be in accordance with BS 9999:2017, 31.2 or BS 9991:2021, 27.2 . <i>NOTE Non-insulated barrier assemblies with sprinklers might be permitted in place of insulated barriers when ad hoc test evidence is used as part of a fire engineered approach.</i>	Should be in accordance with BS 9999:2017, 31.2 or BS 9991:2021, 27.2 . <i>NOTE Non-insulated barrier assemblies with sprinklers might be permitted in place of insulated barriers when ad hoc test evidence is used as part of a fire engineered approach.</i>
Fire resistance radiation (W) BS 8524-1:2023, 5.6.4)	As determined by the building fire strategy. <i>NOTE For example, 30 min (EW30).</i>	As determined by the building fire strategy. <i>NOTE For example, 60 min (EW60).</i>
Radiation and tenability	Should be in accordance with 5.3.2 (see also Annex B).	As determined by the building fire strategy.
Deflection zone (BS 8524-1:2023, 5.6.5)	The minimum width of the route should be increased by the depth of the measured deflection zone.	The measured deflection zone should be taken into account when designing for fire separation.
Smoke containment (BS 8524-1:2023, 5.5 and Annex F)	The demonstrated leakage rate of the barrier assembly should not exceed 3 m ³ /m/h. ^{A)}	As determined by the building fire strategy.
Obstruction warning (see 5.2.5.2)	Should incorporate a device giving a warning alarm.	Should incorporate a device giving a warning alarm, and/or permanent markings should be provided to indicate area to be kept clear.
Control panel (see 5.4)	Should conform to BS EN 60204-1.	Should conform to BS EN 60204-1.
Power supplies (main and back-up) (see 5.4)	Should conform to BS EN 12101-10.	Should conform to BS EN 12101-10.
Supporting construction	Declare as rigid, flexible or associated.	Declare as rigid, flexible or associated.

Table 1 – Performance criteria for barrier assemblies

Parameter	Performance criteria for barrier assemblies forming part of protected route for means of escape purposes	Performance criteria for barrier assemblies used to provide compartmentation within the building
Frequency of intended use (cycle class) (see BS 8524-1:2023, Table 2 and Annex D)	Dependent upon end use, usually Class C1 in accordance with BS EN 16034.	Dependent upon end-use but at least Class C1 in accordance with BS EN 16034. <i>NOTE See BS 8524-1:2023, Table 2.</i>
Emergency egress (see 5.2.4)	Dependent upon location and as determined by the building fire strategy. <i>NOTE See Table 3.</i>	Dependent upon location and as determined by the building fire strategy. <i>NOTE See Table 3.</i>
Self-test facility (BS 8524-1:2023, 5.8.7)	Should be provided for dwellings in accordance with BS 9991:2021, Clause 34, and for other buildings as determined by the building fire strategy.	As determined by the building fire strategy.

^{A)} This includes protected routes in dwellings.

Table 2 – Selection of deployment initiation method

Application	Suitability of initiation method for each application ^{A)}			
	Automatic building fire alarm system or category L5 system ^{B)}	Smoke detector	Heat detector or fusible device	Smoke and heat detector
Compartmentation (non-means of escape) Vertical compartmentation service shaft, escalator containment or similar areas Atria	No No, unless part of the fire strategy	Yes, any one of these three methods depending upon fire strategy Yes, any one of these three methods depending upon fire strategy		
Space separation Unprotected areas or external vertical	No, unless part of the fire strategy	No	Yes	No
Means of escape Holes in walls, lobbies, refuges, services, lift lobbies, cloakroom/reception counters, protected routes or similar areas Kitchens or similar areas ^{C)}	Yes, if required by the fire strategy Yes, if required by the fire strategy	Yes	No	No
Atria (where escape is less than 4.5 m from atria openings through floors) Across means of escape	Yes, if system is fitted No, unless multi-positional	Yes	No	No
Multi-positional deployment				

Table 2 – Selection of deployment initiation method

Application	Suitability of initiation method for each application ^{A)}			
	Automatic building fire alarm system or category L5 system ^{B)}	Stand-alone initiation		
		Smoke detector	Heat detector or fusible device	Smoke and heat detector
All areas	Yes, for first position and any time delay	Yes, any one of these three methods, if required as part of the fire strategy for the second or subsequent position(s)		
Dwellings				
All areas	Yes, LD1 system ^{D)}	Yes, any one of these three methods ^{C)}		

^{A)} “Yes” means that a method should be used; “no” means that it is not usually used.

^{B)} As defined in BS 5839-1:2017. Category L5 does not apply to dwellings.

^{C)} Special consideration is advised for situations where the containment of kitchens (or similar areas) from a means of escape route is proposed, as installing smoke detection within kitchen areas is impractical. Under such circumstances, installing heat detection within the kitchen compartment with an appropriate smoke detector immediately outside the compartment opening(s) might be an acceptable approach. Operation of either the heat detector or the associated smoke detector would allow for the deployment of the barrier assembly, thereby maintaining the protection to the means of escape and reducing the risk of unwanted fire signals.

^{D)} As defined in BS 5839-6:2004.

Table 3 – Selection of deployment method

Application	Suitability of deployment method for each application ^{A)}			
	Immediate single deployment	Immediate multi-positional deployment	Delayed single deployment	Delayed multi-positional deployment
Compartmentation (non-means of escape)				
Vertical compartmentation	Yes	No	No	No
Horizontal, e.g. hole in floor	Yes	No	No	No
Atria	Yes, any one of these four methods depending upon fire strategy			
Space separation				
Unprotected areas or external vertical	Yes	No	No	No
Means of escape				
Vertical protection of holes in walls (e.g. doors/glass), cloakroom/reception counters, serveries, kitchens, stairs and staircases, lobbies, evacuation lifts, refuges and adjacent to external escape routes	Yes, either one of these two methods depending upon fire strategy		No	No
Walls forming a protected route	Yes	No	No	No
Floors forming a protected route	Yes	No	No	No
Atria (where escape is less than 4.5 m from atria openings through floors)	Yes	No	No	No
Across means of escape	Yes, either one of these two methods depending upon fire strategy		No	No
Service shafts	Yes	No	No	No
Dwellings				
All areas	Yes, any one of these four methods depending upon fire strategy			

^{A)} “Yes” means that a method should be used; “no” means that it is not usually used.

5.2.4 Barrier assemblies crossing access/egress routes

5.2.4.1 General

The capabilities of the likely occupants and the use of a building/demise should be assessed when determining whether it is appropriate to provide barrier assemblies across egress routes. This needs to be reviewed and completed as part of the fire strategy process and include consideration of the evacuation of people with disabilities in the event of an emergency (with reference made to Personal Emergency Evacuation Plans (PEEPs) information if available).

Fire and rescue service access arrangements can vary significantly from building to building, and these can influence how barrier assemblies are applied within premises. The assessment should cover the positioning, size, configuration and emergency controls of barrier assemblies in the context of the overall building fire safety design strategy, with it being demonstrated that fire and rescue service access is adequately provided and not impeded by the use of barrier assemblies.

Where barrier assemblies cross access/egress routes, emergency access/egress controls should be installed in accordance with Table 4 to allow the barrier assembly to be temporarily retracted.

NOTE Emergency access controls are provided to allow access through the barrier assembly by the fire and rescue service. Emergency egress controls are provided to allow occupants to escape through the barrier assembly.

Barrier assemblies crossing egress or access routes should provide a clear height of at least 2 m when retracted.

Barrier assemblies should cross egress routes only when 60 persons or fewer are expected to use the route in question.

The motor of the barrier assembly should conform to BS 8524-1:2023, **5.6.7** for emergency egress control and BS 8524-1:2023, **5.6.8** for emergency access control.

The initiation device used to retract a barrier assembly should conform to BS 8524-1:2023, **5.4.3** for emergency egress control and BS 8524-1:2023, **5.4.4** for emergency access control.

Emergency access/egress controls should be located in a prominent, well-illuminated position and should be sited within 2 m of the associated barrier assembly, mounted against a contrasting background to assist with easy recognition. They should be easily accessible and free from potential obstruction.

5.2.4.2 Emergency egress controls

The emergency retract button should raise the barrier and hold it open for at least 5 s before redeploying. This period should be extended where more than six people are expected to use the exit, or as required by the building fire strategy, depending upon the occupancy level and type.

The height of the emergency egress retract control should be between 750 mm and 1 200 mm from the finished floor level. The measurement should be made between the finished floor level and the centre of the retract control.

The externally visible colour of the retract control unit should be green (except where located in dwellings where choice of colour is not specified). The retract control unit should be clearly labelled with permanent signage indicating its purpose and operation, using upper case letters of at least 10 mm in height on a contrasting background.

NOTE 1 An example of signage wording is: "IN EMERGENCY PUSH BUTTON TO RAISE FIRE CURTAIN".

NOTE 2 Attention is drawn to BS 9991:2021 and BS 9999:2017 for means of escape for people with mobility, cognitive, hearing or visual impairment.