FREYA COMPREHENSIVE FIRE SOLUTIONS

PRIVATE & CONFIDENTIAL

Fire Safety Strategy

227 Shepherds Bush Road
London
W6 7AS

FCFS Report FSS/312180-02B

Prepared on behalf of: 227 SBR Ltd
Chancery House
30 St Johns Road
Woking
Surrey
GU21 7SA

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March 2026

Issue Record

Issue	Date	Recipient/s	Comments
02	15th August 2025	Jeremy Sutton	Issue for comment
02A	06th November 2025	Jeremy Sutton, Matthias Hamm	Final Issue
02B	25th March 2026	Jeremy Sutton, Matthias Hamm	Final Issue

Amendment Record

Section	Date	Amendments
19.1	6th November	Amendment of wording regarding structural fire resistance to fire-fighting elements.
4	25th March 2026	Rewording of building description to clarify the town house to the rear.

Quality Control Record

Issue	02	02A	02B	02C
Author	Paul Brown	Paul Brown	Paul Brown	
Reviewer	Richard Morrison	Debra Parkinson	Debra Parkinson	

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1. INTRODUCTION

Freya Comprehensive Fire Solutions Ltd (Freya) have been commissioned to create a fire strategy for the proposed residential development at 227 Shepherds Bush, London W6 7AS by 227 SBR Ltd, Chancery House, 30 St Johns Road, Woking GU21 7SA.

The relevant recommendations for the preparation of a fire safety strategy are contained within Approved Document B (2019 Edition).

For the purposes of this fire safety strategy, BS 9991:2024[1] and BS 9999:2017[2] have been used as a performance benchmark. BS 9991 and BS 9999 offer guidance and recommendations from a fire safety perspective with particular attention to the Building Regulations 2010 (as amended) and the Regulatory Reform (Fire Safety) Order 2005.

Where areas of the design of the building depart from the general guidance and recommendations set out under BS 9991 or BS 9999, it is proposed to adopt alternative solutions using performance-based fire safety engineering in lieu of methodically meeting the guidance and recommendations discussed. In all cases, Freya consider that a satisfactory standard of fire safety is still to be achieved.

This report provides strategic information on means of warning and escape, internal and external fire spread, as well as access and facilities for the Fire and Rescue Service.

This report is based on drawings supplied by the client and prepared by Space Agent Architects and Designers as outlined in the drawings listed below in Table 1.

Drawing Number	Revision	Date	Description
SHE_P01a16a	A	6.06.2025	Ground floor plan as proposed
SHE_P02a16a	A	6.06.2025	Mezzanine plan as proposed
SHE_P03a16a	A	6.06.2025	First floor plan as proposed
SHE_P04a16a	A	6.06.2025	Second floor plan as proposed
SHE_P05a16a	A	6.06.2025	Third floor plan as proposed
SHE_P06a16a	A	6.06.2025	Fourth floor plan as proposed
SHE-P07a16a	A	6.06.2025	Fifth floor as proposed
SHE_P08a16a	A	6.06.2025	Front elevation (West) as proposed
SHE_P09a16a	A	6.06.2025	North elevation as proposed
SHE_P10a16a	A	6.06.2025	South elevation as proposed
SHE_P11a16a	A	6.06.2025	Section B-B as proposed
SHE_P12a16a	A	6.06.2025	Back elevation (East) as proposed

[1] BS 9991:2024 – Fire safety in the design, management and use of residential premises – Code of Practice
[2] BS 9999:2017 – Fire safety in the design, management and use of buildings – Code of practice

SHE_P13a16a	A	6.06.2025	Section A-A as proposed
SHE_P14a16a	A	6.06.2025	Roof plan as proposed

Table 1: Drawings Reviewed

It is also important that the building management teams have a clear understanding of the fire safety strategy adopted, as well as of the operation and maintenance of the equipment designed to protect lives and property.

It is envisaged that this strategy will be used to inform and assist the person(s) responsible for this building in the assessment of risk with regard to fire. As such, this report should be considered along with the recommendations and findings of a fire risk assessment.

The report does not address contractor on-site fire safety issues during construction.

2. THE LONDON PLAN

2.1 General

Under the legislation establishing the Greater London Authority (GLA), the Mayor is required to publish a Spatial Development Strategy (SDS) and keep it under review. The SDS is known as The London Plan. As the overall strategic plan for London, it sets out an integrated economic, environmental, transport and social framework for the development of London.

The London Plan is an integrated policy framework and must be read as a whole. The placement of the topic chapters and the policies within the chapters, is no reflection on their importance or weight – it does not represent a hierarchy.

The London Plan states that:

- All major development proposals should be submitted with a Fire Statement, which is an independent fire strategy, produced by a third party, suitably qualified assessor.

The Town and Country Planning Order 2015 provides a definition of major developments. Generally, major developments are:

- Development of dwellings where 10 or more dwellings are to be provided, or the site area is 0.5 hectares or more;
- Development of other uses, where the floor space is 1,000 square metres or more, or the site area is 1 hectare or more.

Freya therefore considers that, for major developments, the relevant information should be provided in a report, and it is not considered important whether this report is called a "Fire Statement" or a "Fire Strategy".

2.2 Competency

Regarding competency, The London Plan states that:

Fire statements should be submitted with all major development proposals. These should be produced by a third-party independent, suitably- qualified assessor. This should be a qualified engineer with relevant experience in fire safety, such as a chartered engineer registered with the Engineering Council by the Institution of Fire Engineers, or suitably qualified and competent professional with the demonstrable experience to address the complexity of the design being proposed. This should be evidenced in the fire statement.

Planning departments could work with and be assisted by suitably qualified and experienced officers within borough building control departments and/or the London Fire Brigade, in the evaluation of these statements.

This strategy has been completed by Paul Brown Dip. Fire Risk Engineering, MIFireE, MIFPO, Eng Tech, SIIRSM who is a Senior Fire Engineer and Director at Freya Comprehensive Fire Solutions. Freya was created in 2017, and Paul is a founding member of the company.

Prior to Freya, Paul worked with the IFC Group as a Fire Safety Engineer, providing fire strategies for a wide range of developments (including major residential developments in London, hospitals across the UK and university premises). Additionally, Paul has worked on the fire risk management and fire safety management plans for premises ranging from major waste recycling sites across the UK to high profile major events in Central London, as well as historic British landmarks such as the Palace of Westminster.

Prior to IFC, Paul was the Fire Safety Manager at Brunel University (one of London's largest single-site universities) where he was responsible for all fire safety matters on the campus. This included teaching and laboratory accommodation, sports and leisure facilities, as well as student accommodation. He was responsible for transforming a simple indoor running track into an arena to support the graduation party for over 3,000 students through an engineered approach, as well as helping design the first large metals research facility in London on behalf of Jaguar/Land Rover.

Prior to Brunel, Paul was an Inspecting Officer with the London Fire Brigade. During his eight-year tenure he was responsible for designing futuristic-style buildings, such as the Wembley Civic Centre, where the desire was for an open floor plan office, utilising water mist suppression systems and sprinkler deluge systems to support a reduction in fire compartmentation, and one of London's largest IKEA megastores. Additionally, he performed an auditing and enforcement role, including reviewing over 100 Building Control consultations and also determining the suitability and standard of over 1000 fire risk assessments across the Northwest London region.

2.3 Fire Safety Policies

To demonstrate a level of general conformity, this fire strategy has been developed to consider the following fire safety Policies of The London Plan.

- Policy D5(B5): Inclusive Design
- Policy D12 Fire Safety - Policy D12A
- Policy D12 Fire Safety - Policy D12B

2.3.1 Policy D5: Inclusive Design

Policy D5 of The London Plan states (in section B) the following:

Boroughs, in preparing their Development Plans, should support the creation of inclusive neighbourhoods by embedding inclusive design, and collaborating with local communities in the development of planning policies that affect them.

Development proposals should achieve the highest standards of accessible and inclusive design. They should:

- *be designed taking into account London's diverse population*
- *provide high quality people focused spaces that are designed to facilitate social interaction and inclusion*
- *be convenient and welcoming with no disabling barriers, providing independent access without additional undue effort, separation or special treatment*
- *be able to be entered, used and exited safely, easily and with dignity for all*
- *be designed to incorporate safe and dignified emergency evacuation for all building users. In all developments where lifts are installed, as a minimum at least one lift per core (or more subject to capacity assessments) should be a suitably sized fire evacuation lift suitable to be used to evacuate people who require level access from the building.*

The London Plan states that:

Buildings should be designed and built to accommodate robust emergency evacuation procedures for all building users, including those who require level access. All building users should be able to evacuate from a building with dignity and by as independent means as possible. Emergency carry down or carry up mechanical devices or similar interventions that rely on manual handling are not considered to be appropriate, for reasons of user dignity and independence.

The installation of lifts which can be used for evacuation purposes (accompanied by a management plan) provide a dignified and more independent solution. The fire evacuation lifts and associated provisions should be appropriately designed, constructed and include the necessary controls suitable for the purposes intended.

Policy D5(B5) as set out above is relevant to the fire safety of the building.

2.3.2 Policy D12A: Fire Safety

Policy D12A of The London Plan states:

In the interests of fire safety and to ensure the safety of all building users, all development proposals must achieve the highest standards of fire safety and ensure that they:

- *identify suitably positioned unobstructed outside space for fire appliances to be positioned on and appropriate for use as an evacuation assembly point*
- *are designed to incorporate appropriate features which reduce the risk to life and the risk of serious injury in the event of a fire; including appropriate fire alarm systems and passive and active fire safety measures*
- *are constructed in an appropriate way to minimise the risk of fire spread*
- *provide suitable and convenient means of escape, and associated evacuation strategy for all building users*
- *develop a robust strategy for evacuation which can be periodically updated and published, and which all building users can have confidence in*
- *provide suitable access and equipment for firefighting which is appropriate for the size and use of the development.*

2.3.3 Policy D12B: Fire Safety

Policy D12B of The London Plan states:

All major development proposals should be submitted with a Fire Statement, which is an independent fire strategy, produced by a third party, suitably qualified assessor.

The statement should detail how the development proposal will function in terms of:

- *the building's construction: methods, products and materials used, including manufacturers' details*
- *the means of escape for all building users: suitably designed stair cores, escape for building users who are disabled or require level access, and associated evacuation strategy approach*
- *features which reduce the risk to life: fire alarm systems, passive and active fire safety measures and associated management and maintenance plans*
- *access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and positioning of equipment, firefighting lifts, stairs and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these*
- *how provision will be made within the curtilage of the site to enable fire appliances to gain access to the building*
- *ensuring that any potential future modifications to the building will take into account and not compromise the base build fire safety/protection measures.*

3. FIRE ENGINEERING BRIEF

The purpose of the fire engineering brief is to consult with the relevant stakeholders to define the scope of the project, to agree upon the objectives and fire safety measures, as well as avoid the need for extra building work to be undertaken at the end of a project before a building can be occupied for its intended purpose.

Procedural guidelines[3] for fire safety (prepared by the Department for Communities and Local Government) provides direction with regard to the extent of consultation needed during the building approvals process.

In terms of approval, the three key bodies concerning fire safety are the Building Control body, the fire safety enforcing authority and the housing authority.

3.1 Building Control

Building Control bodies are responsible for monitoring compliance with the requirements of the Building Regulations and should take a co-ordinating role with fire safety enforcement authorities (and where appropriate, with other regulatory bodies).

This strategy will need to be issued to the relevant Building Control authority for consideration and negotiation with the fire safety enforcing authority.

3.2 Fire Safety Authority

The fire safety enforcing authority is responsible for the enforcement of the Regulatory Reform (Fire Safety) Order 2005 (FSO), which concerns the safety of people in relation to the operation and the use of certain buildings once they are occupied.

3.3 Housing Authority

The local housing authority are responsible for the enforcement of the Housing Act 2004, which concerns the safety and welfare of persons in various forms of residential premises.

4. BUILDING DESCRIPTION

The proposed development is for the conversion of an existing commercial premises and the creation of an additional two storeys so as to provide twenty-one (21) single-storey residential apartments and five (5) duplex apartments, as well as a commercial premises at ground floor level.

The building will comprise of six (6) storeys (ground and 1st to 5th floors).

To the rear of the building there is an attached two storey building that will be created as a townhouse with an independent entrance. Due to the height of the ground floor to 1st floor the upper floor of the town house sits between storey levels of the main building. However, the overall height of the building is not increased through this adjoining premises

[3] Department for Communities and Local Government, Building Regulations and Fire Safety Procedural Guidance, Fourth Edition, July 2020.

5. PROPOSED EVACUATION APPROACH

5.1 Residential Areas

The approach to the evacuation of the building is a defend-in-place evacuation.

A defend-in-place evacuation strategy is typically assigned to residential apartments due to the high degree of compartmentation. A fire is assumed to be confined in the flat of fire origin, and only the occupants in the flat of fire origin evacuate in the first instance.

Other building occupants may remain unaware of the fire unless evacuated by the Fire and Rescue Service or Management (where applicable), or they may choose to evacuate at any time.

5.2 Commercial Premises

For the commercial premises the evacuation approach is to be simultaneous evacuation.

6. OCCUPANCY RISK PROFILE

6.1 Occupancy Characteristics

As there is a commercial premises at ground floor level, it is necessary to determine the occupancy risk profile for that area.

When referring to Table 2, the occupancy characteristic for these premises would be occupants who are awake and unfamiliar with the building. Therefore, this gives the occupancy characteristics of **B** in accordance with BS 9999.

Occupancy characteristic	Description	Examples
A	Occupants who are awake and familiar with the building	Schools, office and industrial premises
B	Occupants who are awake and unfamiliar with the building	Shops, exhibitions, museums, leisure centres, other assembly buildings, etc.
C	Occupants who are likely to be asleep:	
Ci	• Long-term occupancy	Individual flats without 24-hour maintenance and management control on site
Cii	• Long-term managed occupancy	Serviced flats, halls of residence, sleeping areas or boarding schools
Ciii	• Short-term occupancy	Hotels
D	Occupants receiving medical care	Hospitals, residential care facilities
E	Occupants in transit	Railway stations, airports

Table 2: Occupancy Characteristics

6.2 Fire Growth Rate

At present, the use and layout of the ground floor is not defined and, therefore, the fire growth rate is the pace at which it is estimated that a fire will grow in its anticipated use which would be as a retail premises. The fire load within the building is expected to be consistent with that for its use, and no unusual amounts of accelerants should be permitted without a full fire risk assessment being completed beforehand.

On this basis, the utilisation of information in Table 3 determines that the anticipated fire growth rate would be **Medium**.

Category	Fire growth rate	Examples	Fire growth parameter kJ/s^3
1	Slow	Evenly distributed low level fire load, small discrete packets of fuel or material of limited combustibility	0.0029
2	Medium	Evenly distributed low to mid-level fire load comprising a mix of combustible materials.	0.012
3	Fast	Stacked combustibles (on or off racking and shelving excluding high rack storage), some small quantities of materials other than materials of limited combustibility (or where larger quantities are stored in separate fire-resisting enclosures), processing, manufacturing or storage of combustible materials.	0.047
4	Ultra-fast	Medium to large quantities of materials other than materials of limited combustibility, high racked storage, flammable liquids and gases or where rapid uncontrolled fire growth could occur.	0.188

Table 3: Fire Growth Rate

6.3 Risk Profile

Risk profiles are a combination of the occupancy characteristic and fire growth rate as shown in Table 4 of BS 9999 and reproduced in Figure 1 below.

Table 4 **Risk profiles**

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

[A] These categories are unacceptable within the scope of BS 9999. Addition of an effective localized suppression system or sprinklers will reduce the fire growth rate and consequently change the category (see 6.5).

[B] Risk profile C has sub-categories (see Table 2).

[C] Risk profile C3 is unacceptable under many circumstances unless special precautions are taken.

Figure 1: Reproduction of Table 4 of BS 9999

This allows us to determine the initial risk profile for the occupants within the commercial premises as being **B2**. However, as an Automatic Water Fire Suppression System is to be provided throughout the building, BS9999 allows that the risk profile may be reduced to **B1.**

7. MEANS OF WARNING

7.1 Individual Apartments

The design proposal is for each apartment to be provided with a fire alarm system to a Grade D1 Category LD1. This system should incorporate detectors in all circulation spaces that form part of the escape routes from the apartment, as well as in all rooms and areas, other than those with negligible sources of ignition such as toilets bathrooms and shower rooms.

A heat detector should be installed in every kitchen. As the kitchen is combined with the lounge, consideration needs to be given to spacing requirements and the potential for false alarms from a smoke detector in the lounge.

The Automatic Fire Detection (AFD) system for each apartment should be provided with an integral standby power supply.

The smoke and heat alarms should comply with BS EN 14604:2005[4] and BS 5446-2:2003[5] respectively.

It is not necessary to provide AFD interconnection between apartments.

For the 5th floor duplex apartments with access to the roof terrace then, due to the open cooking situation within the access room, smoke detection should be included to the access room and a sounder provided to the balcony.

7.2 Communal Areas

It is not a recommendation of any code of practice to provide fire alarms (sounders) in the common areas of residential buildings when a defend-in-place strategy has been adopted. However, Automatic Fire Detection is to be provided in common areas to operate fire protection systems, including the smoke control system serving those areas.

Within the Protected Corridors of the residential common areas, Automatic Fire Detection (without sounders) should be provided. Actuation of a smoke detector within a Protected Corridor must immediately activate the automatic opening mechanisms for the Automatic Opening Vent (AOVs) relevant to that area. The stair AOV should also open simultaneously upon actuation of any of the smoke detection within the Protected Corridors leading onto the relevant Protected Stair.

It is not proposed to install Manual Call Points (MCPs) in the residential common areas. However, Fire & Rescue Service vent-override controls should be provided in appropriate locations.

Smoke detectors installed within the apartment common corridors need not sound an alarm to those areas. However, immediate notification should be provided at the Fire Alarm Control Panel (FACP).

7.3 Commercial Premises

The commercial premises will be developed to shell stage only, with fit-outs of the individual units undertaken on occupation.

The standard of alarm system to be provided should be to an appropriate standard in accordance with BS 5839-1:2017[6]. The provision of the fire alarm system will be dependent on the landlord's requirements. However, generally the retail unit occupier would have an individual fire alarm system installed as determined by a fire risk assessment of their unit.

[4] BS EN 14604:2005 – Smoke alarm devices.
[5] BS 5446-2:2003 – Fire detection and fire alarm devices for dwellings. Part 2: Specification for heat alarm.
[6] BS 5839-1:2017 – Fire detection and fire alarm systems for buildings – Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises

8. OCCUPANCY NUMBERS

To allow for the maximum potential use of the commercial premises whilst ensuring that an evacuation in an emergency situation can successfully be achieved it is necessary for the building occupancy capacity calculations to be done as a minimum two-stage process:

- Stage 1 – Determination of the maximum potential floor capacity based on the allowable occupancy density
- Stage 2 – Determination the number of storey exits and their flow capacity (after discounting the largest exit)

8.1 Occupancy Density

Occupancy density is the calculation of a realistic estimate of the maximum occupancy of a building based on the proposed use. The calculation should take into account that a proportion of the occupants may have some form of disability.

As the use of the commercial premises is likely to be either office space or a retail unit, Table 9 of BS 9999, as reproduced in Figure 2 below, does offer specific examples to support the proposed use of the building.

Table 9 Examples of typical floor space factors

Use type	Density	Floor space factor [A]	Example
		m^2 per person	
Offices	High	4	Call centre
	Normal	6	Typical open plan office
	Low	10	Cellular office
Shops	Normal	2	Clothing store
	Medium	4	Supermarket
	Low	7	Furniture showroom
Standing areas	Very high	0.3	People queuing
	High	0.5	Bar
	Normal	1	Theatre or cinema foyer
	Low	2	Museum or gallery
Seating areas [B]	Normal	0.4	Theatre or cinema auditorium

[A] The factors given in Table 9 are only typical and higher or lower factors might be more appropriate depending on the circumstances of the intended use and nature of the occupants.

[B] Where the number of seats is known, the floor space factor is based on that number.

Figure 2: Reproduction of Table 9 of BS 9999

Based on the anticipated usage, it is reasonable to argue that a floor space factor of 4m^2 per person is acceptable.

The ground floor area is approximately 100m^2, which would allow a maximum potential occupancy of 25 persons.

However, the maximum allowable occupancy is also dependent on the number of available final exits. The ground floor area has a single final exit.

Table 10 of BS 9999, as reproduced in Figure 3 below, restricts the maximum number of persons within a premises that only has a single exit to 60 persons. Whilst it is noted that there are two doors into the commercial premises, their close proximity to each other means that they should be considered as being one exit. Therefore, there is sufficient exit capacity to support the anticipated maximum occupancy.

Table 10 **Minimum number of escape routes and exits from a room, tier or storey**

Maximum number of persons	Minimum number of escape routes/exits
60	1
600	2
More than 600	3

Figure 3: Reproduction of Table 10 of BS 9999

9. MEANS OF ESCAPE

9.1 General

Within apartment blocks (owing to the high degree of compartmentation provided in dwellings of modern blocks), the spread of fire and smoke from one dwelling to another and the need to evacuate the occupants of adjoining dwellings are unusual. The occupants should be safe if they remain where they are.

Nevertheless, the possibility that individuals may seek to leave the building cannot be overlooked. Therefore, provision should be made for the occupant of any dwelling to do so by their own unaided efforts, using adequately protected escape routes without outside assistance.

The internal planning of any dwelling apartment depends on its size, height and whether it has an independent final exit. Due to the presence of sleeping occupants within a dwelling (who may require a significant period of pre-movement time), it is essential to ensure that adequate and suitable means of escape are provided.

The defined term for apartment or apartments under BS 9991 is as follows:

- *Flat: separate and self-contained premises, constructed or adapted for use for residential purposes and forming part of a building from some other part of which it is divided horizontally, having all its rooms on one level or not more than half a storey height apart.*

9.2 Evacuation within the Apartments

9.2.1 Single-Storey Apartments

For the single-storey residential apartments, each apartment is to be provided with a Category LD1 fire alarm system, as detailed in Section 8.1 of this fire strategy, and an Automatic Water Fire Suppression System (AWFSS) as detailed in section 13 of this strategy.

Sections 5.6, 8.5 and Figure 2 of BS 9991, as reproduced in Figure 4 below, offer guidance on the design of open-plan apartment layouts.

On this basis, the design of the apartments should ensure that the location of any cooking facilities will not impact on the escape routes from the apartment. To this end, the edge of the cooking apparatus should be at least 1.8m away from the escape route leading to the apartment entrance. The egress route should also be a minimum of 0.9m in width with no fixed obstructions (such as radiators or cupboards) located within the escape route.

A gap of 0.3m should be provided between the leading edge of the apartment door and the 1.8m exclusion zone from the cooking apparatus. Figure 2 of BS 9991 is reproduced in Figure 4 below to assist with an understanding of these recommendations.

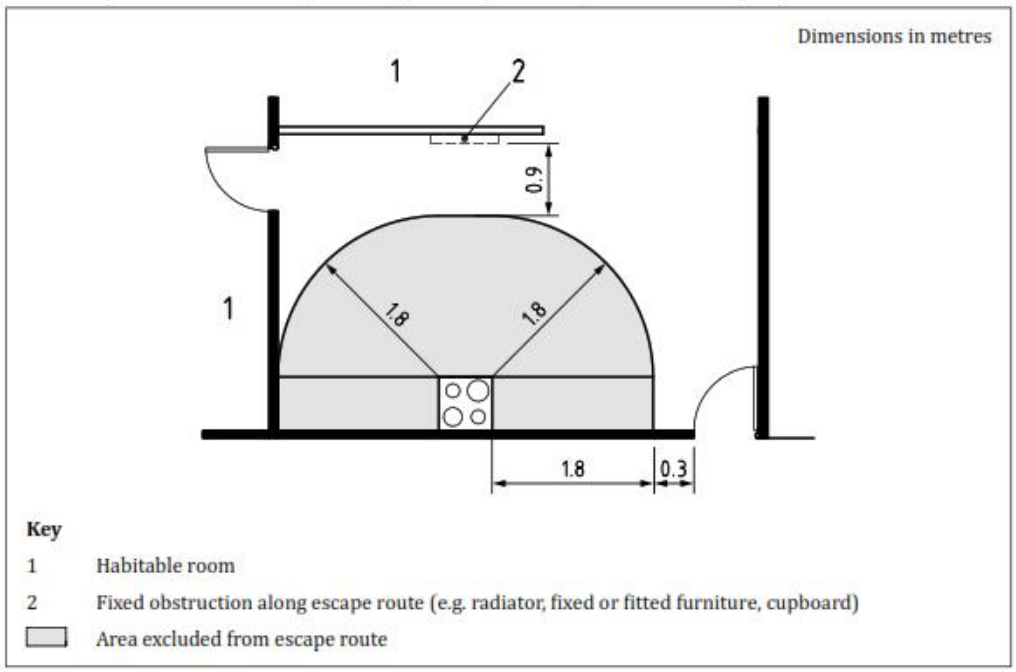


Figure 4: Reproduction of Figure 2 of BS 9991

9.2.2 Duplex Apartments

For the duplex apartments, the design approach is for the provision of a Protected Stair in each apartment that leads into a Protected Entrance Hall at access level and then onto a final exit from the apartment. The design of the apartments should be such, that the maximum travel distance from any habitable room to the final exit from the apartment will be 9m.

Where duplex apartments have access to an external terrace, then the recommendations of Section 9.1 of this strategy in regard to the means of escape past the cooking facilities should also be applied to the escape routes from the terraces.

9.3 Horizontal Evacuation

9.3.1 Residential common areas

For single staircase buildings, the recommendations of BS 9991 are shown in Figure 8 of BS 9991 as reproduced in Figure 5 below.

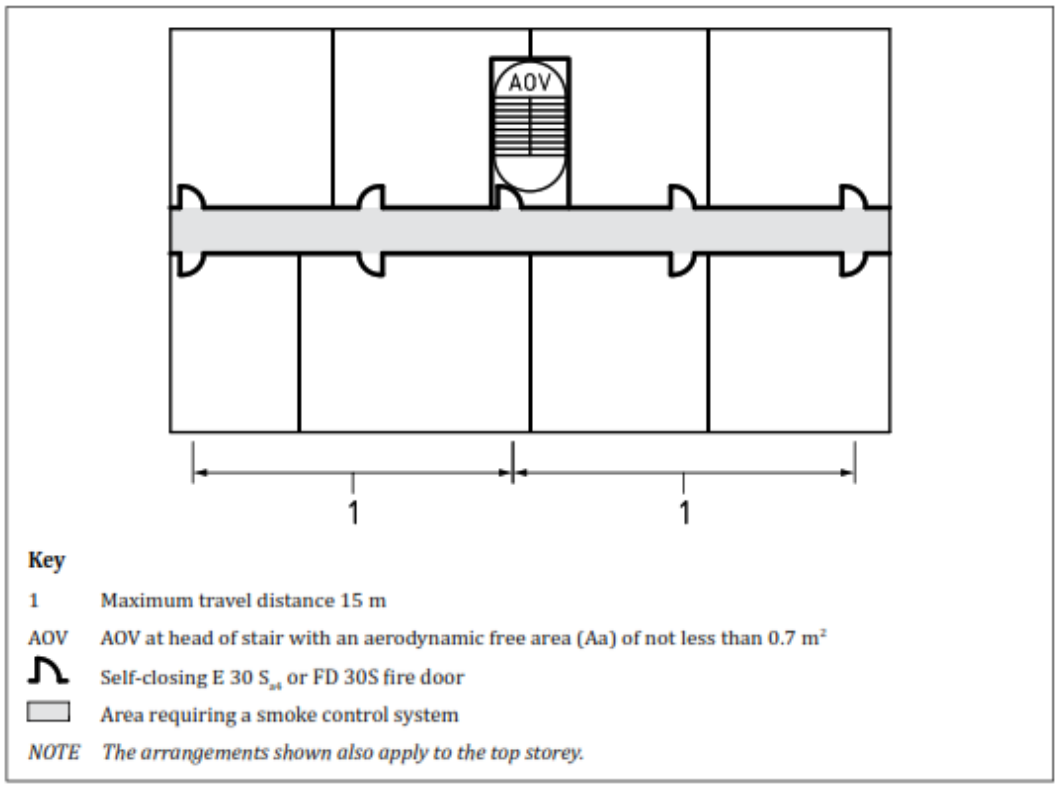


Figure 5: Reproduction of Figure 8 of BS 9991

This design requires that the common Protected Corridor be open to the stairs and ventilated along its length, with a maximum travel distance of 15m from an apartment entrance door to the door to the Protected Stairs. This would allow for only two-door separation between an apartment and the Protected Stairs.

However, with this design it would not be possible to achieve the requirements of the London Plan to provide a safe refuge for the evacuation lift, whereby the Protected Lobby should be ventilated, and should not allow direct access to apartment entrance doors so as to minimise the exposure of occupants to smoke and heat whilst also preventing further smoke ingress to the Protected Lobby.

Therefore, the proposed design works is for a maximum travel distance of 7.5m through unventilated Protected Lobbies, as shown in red in Figures 6 and 7 below, prior to entering a ventilated Protected Corridor (as shown in green) that will lead onto the Protected Stairs.

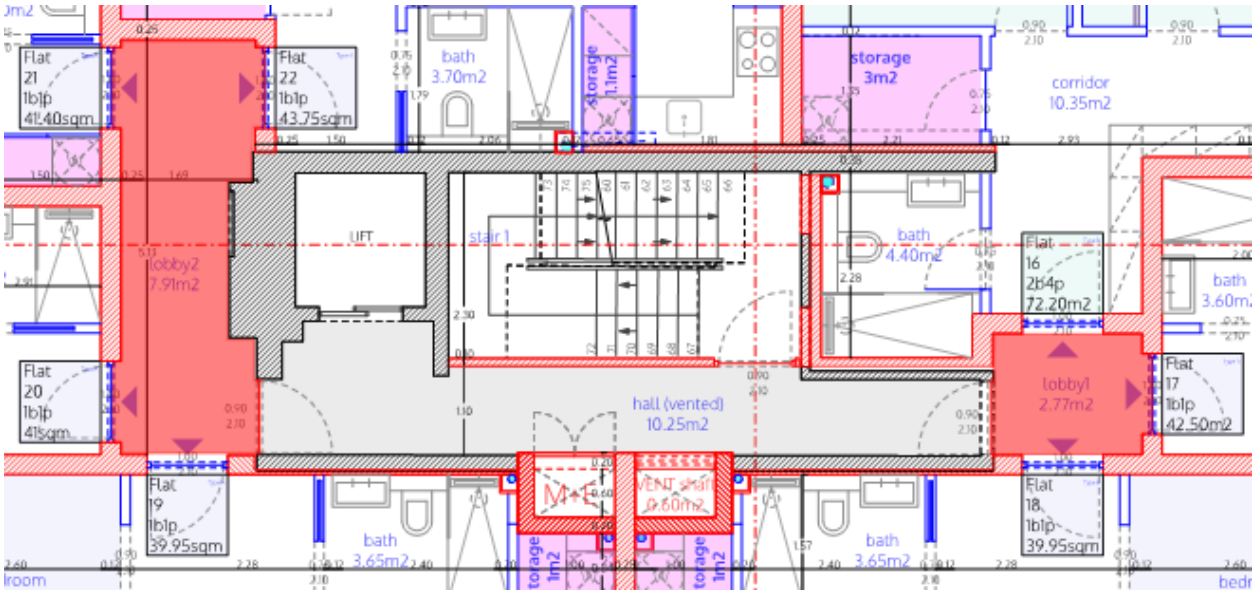


Figure 6: Typical communal escape route layout for the 1st to 3rd floors

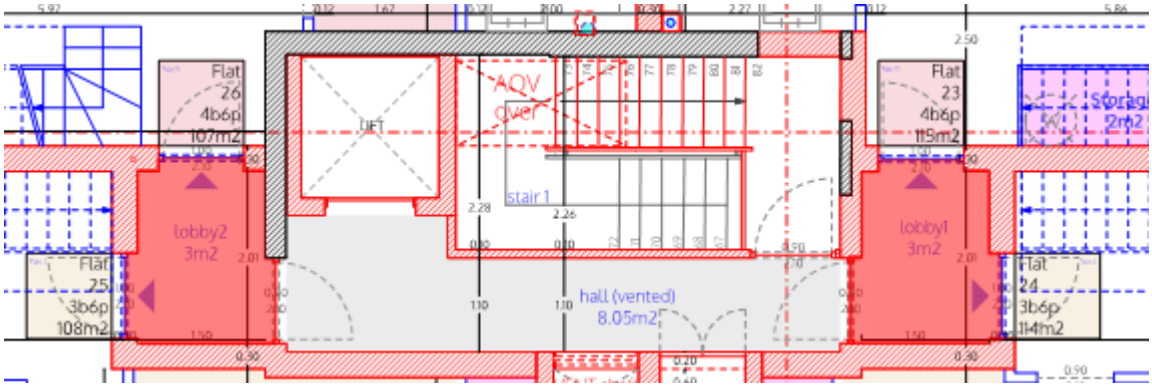
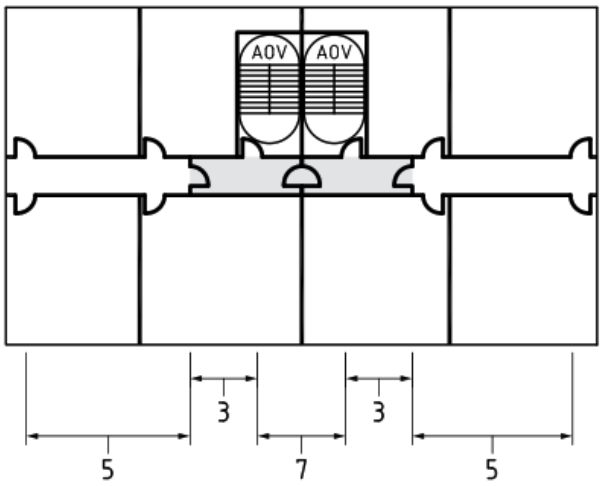


Figure 7: Communal escape route layout for the 4th floor

Whilst it is acknowledged that this is a variance from the recommendations of BS 9991, it can be reasonably argued that this design is no more onerous than that which would be allowed for a two staircase building where the stairs are close together, as shown in Figure 7(f) of BS 9991 and reproduced in Figure 8 below.



f) Subdivision of corridor connecting two (or more) escape stairways with stairs close together

Figure 8: Reproduction of Figure 7(f) of BS 9991

9.3.2 Commercial Premises

As the commercial premises are separated from the residential accommodation, BS 9999 should be used to determine the allowable travel distances.

As mentioned in Section 6.3 of this strategy, the risk profile for the Retail Unit is **B1**. Table 11 of BS 9999 provides allowable travel distances for risk profiles as reproduced in Figure 9 below.

Table 11 Maximum travel distance when minimum fire protection measures are provided[A]

Risk profile	Travel distance, in metres (m)			
	Two-way travel [B]		One-way travel	
	Direct	Actual	Direct	Actual
A1	44	65	17	26
A2	37	55	15	22
A3	30	45	12	18
A4 [C]	Not applicable [C]	Not applicable [C]	Not applicable [C]	Not applicable [C]
B1	40	60	16	24
B2	33	50	13	20
B3	27	40	11	16
B4 [C]	Not applicable [C]	Not applicable [C]	Not applicable [C]	Not applicable [C]
C1	18	27	9	13
C2	12	18	6	9
C3 [C]	9	14	5	7
C4 [C]	Not applicable [C]	Not applicable [C]	Not applicable [C]	Not applicable [C]

NOTE 1 Direct travel applies where the layout is unknown, actual travel distance applies where it is known.

NOTE 2 Where premises contain provisions for the consumption of alcoholic beverages then a reduction in the travel distances of 25% might be advisable for those particular parts of the premises.

[A] This is the maximum travel distance that is allowable when the minimum level of fire protection measures is provided (see Clause 15). For example, the maximum length of one-way travel is 22 m for a category A2 risk where the internal layout is known, according to Table 11. By fitting sprinklers, this risk is changed to A1, so the maximum length of one-way travel is increased to 26 m. If additional fire protection measures are provided then the travel distance may be increased (see Clause 18).

[B] The two-way travel distance limit for hotels is measured from the entrance to the bedroom/suite, not from the most remote part of the bedroom/suite.

[C] See Table 4.

Figure 9: Reproduction of Table 17 of BS 9999

The direct travel for a single direction means of escape for a B1 profile is 16m for one-way travel. As there is a single exit from the commercial premises, the travel distances can be achieved as shown in Figure 10 below.

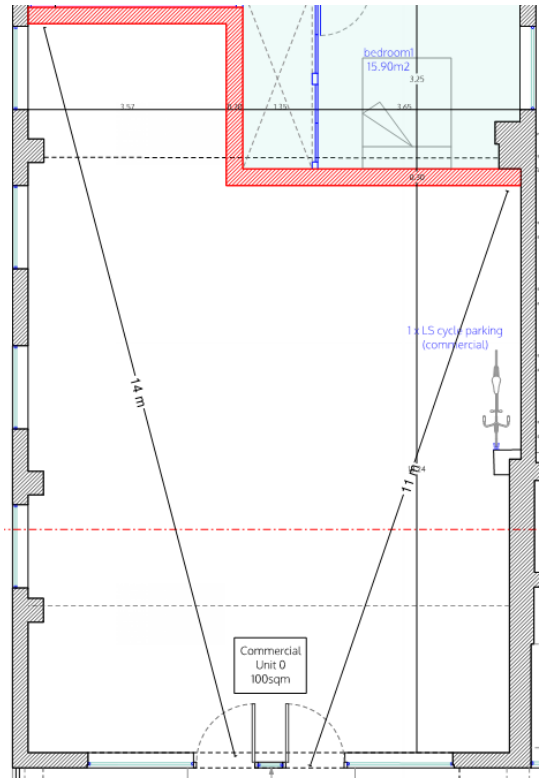


Figure 10: Horizontal travel distances within the commercial premises

9.4 Vertical Means of Escape

9.4.1 Internal Protected Stairs

As the building does not have a top storey height greater than 18m, the stairs are to be considered Protected Stairs. As such, the stairs should have an unobstructed width of 750mm when measured between the walls and balustrades.

Handrails and strings that do not intrude more than 100mm into a stair width may be discounted.

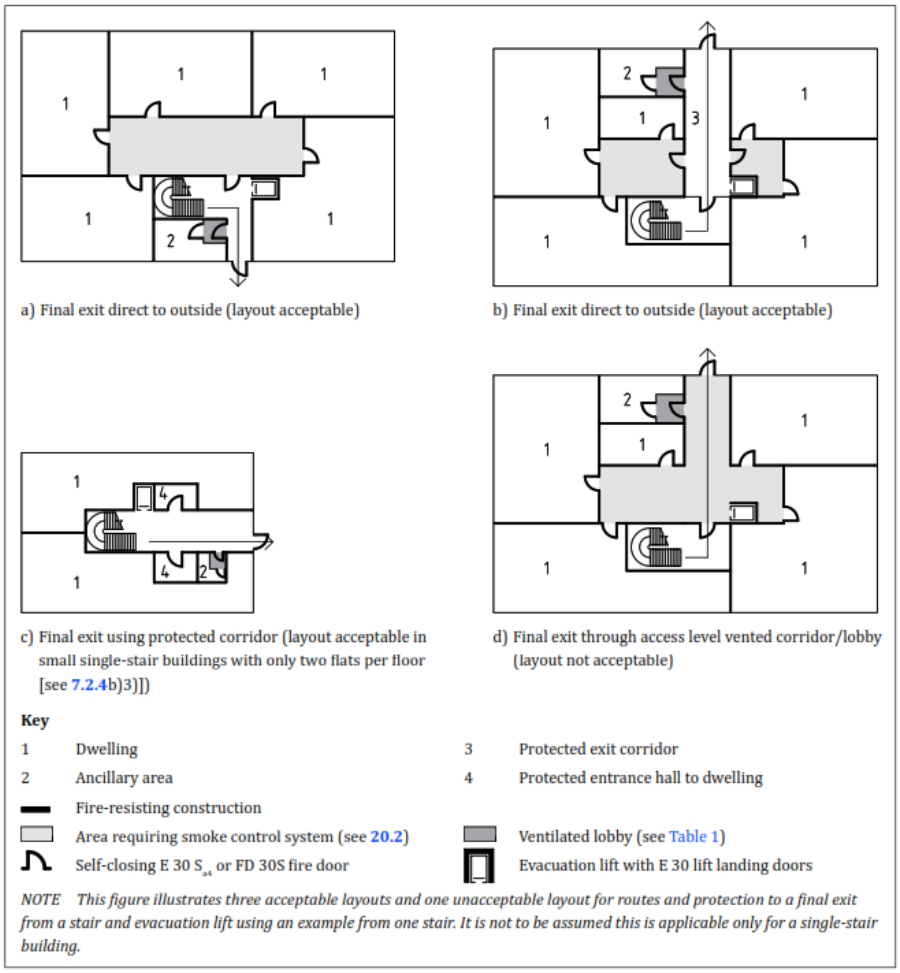
9.4.2 External Stairs

Whilst it is noted that there is an external stair, this would not normally be considered as forming part of the means of escape for this premises due to the there being a storey level in excess of 6m; residents should be advised to evacuate via the internal Protected Stairs.

9.5 Discharge from Final Exits

The discharge from the Protected Stairs and evacuation lifts will follow the guidance of Section 15 and Figure 31 of BS 9991, as reproduced in Figure 11 below.

Figure 31 — *Examples of final exit route and protection from stairways and evacuation lifts*



NOTE This figure illustrates three acceptable layouts and one unacceptable layout for routes and protection to a final exit from a stair and evacuation lift using an example from one stair. It is not to be assumed this is applicable only for a single-stair building.

Figure 11: Reproduction of Figure 31 of BS 9991

At ground floor level the final exit for the upper floor apartments is separated from the commercial premises by fire-resisting construction, and there are no residential apartments at that level that would impact the final exit.

10. EVACUATION LIFTS

The London Plan Policy D5(B5) would apply as the building is within the area of the Greater London Authority. As mentioned earlier, the guidance of this policy is that, in all buildings where lifts are installed, an evacuation lift should be provided.

The design proposal is that an evacuation lift will be provided alongside the Protected Stairs.

An Emergency Voice Communication (EVC) System, complying with BS 5839-9:2021[7] is to be provided adjacent to the temporary waiting space. It should consist of a Type B out station communicating with a master station located next to the main entrance.

The lift lobby and the lift car should achieve the minimum dimensions as detailed in Figure 14 of BS 9991 and reproduced in Figure 12 below.

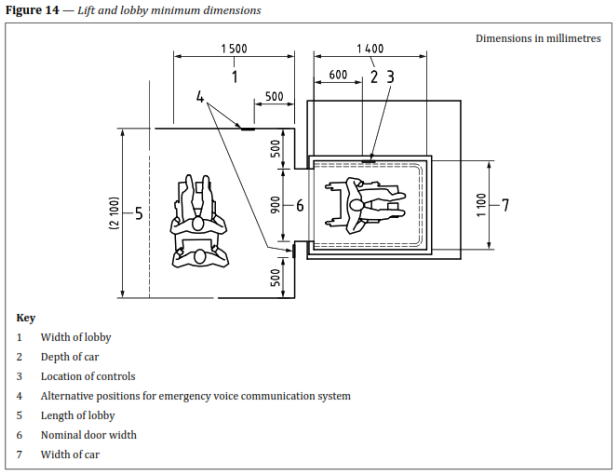


Figure 12: Reproduction of Figure 14 of BS 9991

The walls of the lift landing, temporary waiting space, landing floor, lift floor and the lift door should contrast visually. A visually contrasting floor surface measuring at least 1.5m by 1.5m should be provided outside the lift doors.

The evacuation lifts should include driver-assisted evacuation operation and automatic evacuation operation.

Signage should be provided to identify the lifts as being evacuation lifts.

The proposed location for the temporary waiting area on each level is shown in Figure 13 below.

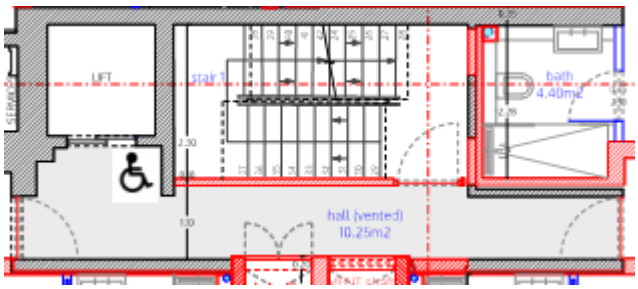


Figure 13: Proposed location of the temporary waiting area

[7] BS 5839-9:2021 – Fire detection and fire alarm systems for buildings – Part 9: Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems.

11. SMOKE HAZARD MANAGEMENT

As discussed in Section 7.2 of this strategy, the intention for the residential areas is to provide smoke ventilation as required to the Protected Lobbies leading onto the Protected Stairs.

11.1 Protected Corridor

The Protected Corridors are to be provided with smoke ventilation via a smoke shaft. The smoke shaft is to be a minimum of 0.6m^2 and designed to utilise a Mechanical Smoke Ventilation System (MSVS) in accordance with Section 20.2.2.3(b) and Appendix F.3.2 of BS 9991.

To support this design, Computational Fluid Dynamics modelling will be required.

11.2 Protected Stairs

The Protected Stairs are to be provided with an AOV with a minimum free venting area of 1m^2 at roof level.

Any fire and smoke control assemblies should be provided with an appropriate certificate from a recognised third-party accreditation body in order to demonstrate compliance with Regulation 38 of the Building Regulations 2010 (as amended). Assessment and test evidence should also be available for inspection by the approving authorities and other interested parties.

12. MANUAL OPERATION OF SMOKE VENTS AND AOVS

Automatic Opening Vents are to have an "AUTO", "OPEN" and "CLOSE" override capability (for use by the Fire & Rescue Service) located at ground floor level of each stair.

These override controls should be located near the Fire Alarm Control Panel (FACP) in a prominent location and within reasonable reach for ease of operation. Fire equipment signage should be provided adjacent to manual control switches to identify control function. However, the control switches operate a break glass system which is self-explanatory.

Protective casing for controls should be considered to mitigate the risk of misuse by building occupants or others.

13. AUTOMATIC WATER FIRE SUPPRESSION SYSTEMS

13.1 Residential Apartments

As the building has a storey level in excess of 11m but less than 18m, an Automatic Water Fire Suppression System (AWFSS) is to be provided in each apartment in accordance with BS 9251:2021[8] for a Category 2 system design.

As the communal Protected Corridors and Protected Lobbies are designed to be sterile areas, then the number of design sprinklers can be limited to two if agreed with the Authority Having Jurisdiction (AHJ).

13.2 Commercial Premises

As the area of the commercial premises is less than 100m^2, the AWFSS will be provided as part of the residential system design as per Table 3 of BS 9251, reproduced in Figure 14 below, on the basis that the floor area will not exceed those allowed in Table 4 of BS 9251 as reproduced in Figure 15 below.

Table 3 — *Examples of classification of areas and design criteria for areas protected with "Residential" BS EN 12259-14 sprinkler heads*

Occupancy	BS 9251 category (see Table 1)	Minimum density mm/min	Minimum number of design sprinklers
One or two car garage [A], where sprinkler protected, attached to a dwelling	1	2.10 [B]	In accordance with Table 2
Car parking [A] within or beneath a block of flats	2, 3 and 4	See Table 4	See Table 4
Bin store within or beneath the flats	2, 3 and 4	See Table 4	See Table 4
Limited office areas (e.g. concierge or site management) [C]	2, 3 and 4	2.80	As per Table 2
Residents' storage sheds/tenant stores [A]	2, 3 and 4	See Table 4	See Table 4
PTSN/CCTV/Electrical rooms	2, 3 and 4	2.80	As per Table 2
Plant rooms	2, 3 and 4	See Table 4	As per Table 2
Domestic laundry/utility room	1	2.10	As per Table 2
Laundry (with storage and processing of linen, e.g. institutional, care home)	2, 3 and 4	See Table 4	See Table 4
Laundry (communal facility)	2, 3 and 4	2.80	As per Table 2
Domestic kitchens	1	2.10	As per Table 2
Hairdressing room	2, 3 and 4	2.80	As per Table 2
Retail (e.g. shop or kiosk)	2, 3 and 4	See Table 4	See Table 4
Foyer/reception	2, 3 and 4	2.80	As per Table 2
Bar/restaurant/cafe	2, 3 and 4	See Table 4	See Table 4
Kitchens in student hub accommodation (e.g. self-catering)	3 and 4	2.80	As per Table 2
Kitchens [D] in residential care or similar premises, e.g. care home ≤50 m^2	2 and 3	2.80	As per Table 2
Kitchens [D] in residential care or similar premises, e.g. care home >50 m^2	2 and 3	See Table 4	See Table 4

Figure 14: Reproduction of Table 3 of BS 9251

[8] BS 9251:2021 – Fire sprinkler systems for domestic and residential occupancies. Code of practice.

Table 4 — *Examples of classification of areas and design criteria for areas to be protected with BS EN 12259-1 sprinkler heads*

Occupancy	Minimum density mm/min	Area of operation [A]
Car parking [B] within or beneath a block of flats	5.00	100 m²
Bin store [B], [C] within or beneath the flats		72 m²
Limited office areas (e.g. concierge or site management) [D]		72 m²
Residents' storage sheds/tenant stores [B]		4 heads
PTSN/CCTV/electrical rooms		72 m²
Plant rooms		100 m²
Laundry (with storage and processing of linen, e.g. institutional, care home)		100 m²
Laundry (communal facility)		72 m²
Hairdressing room		72 m²
Retail (e.g. shop)		100 m²
Bar/restaurant/cafe		72 m²
Kitchens in student hub accommodation (e.g. self-catering)		72 m²
Kitchens [E] in residential care or similar premises (e.g. care home) ≤50 m²		72 m²
Kitchens [E] in residential care or similar premises (e.g. care home) >50 m²		72 m²

[A] If the compartment (fire) area is less than 50 m², a maximum of four heads is required as the area of operation. Where greater than 50 m², refer to area of operation or compartment (fire) area, whichever is the lesser.

[B] Attention is drawn to the need to consider protection from frost damage.

[C] On the basis of the bin store building or compartment (fire) being of at least a minimum of 1 h fire resisting construction from the rest of the buildings.

[D] See also Table 3. Conduct a hazard evaluation to determine which option is most appropriate.

[E] Kitchens with deep oil cookers should be fitted with an appropriate local application system in addition to the sprinkler protection identified in this table (e.g. LPS1223, see BS 5306-0).

Figure 15: Reproduction of Table 4 of BS 9251

There is an increase in minimum density for the ancillary areas to 5mm/min/m^2 over the residential areas which is only 2.80mm/min/m^2.

14. EMERGENCY LIGHTING AND EXIT SIGNAGE

Emergency lighting should be provided throughout the building to the extent nominated under BS 5266-1:2016[9]. As such, emergency lighting should be provided to all residential communal areas and the commercial premises.

Escape signage should be provided to meet the requirements of BS 5499-4:2013[10] or BS ISO 3864-4:2011[11].

[9] BS 5266-1:2016 – Emergency lighting. Part 1: Code of practice for the emergency lighting of premises.
[10] BS 5499-4:2013 – Safety signs. Part 4: Code of practice for escape route signing.
[11] BS ISO 3864-4:2011 – Graphical symbols - Safety colours and safety signs. Part 4: Colorimetric and photometric properties of safety sign materials.

15. SECONDARY POWER SUPPLIES

All life safety systems and the evacuation lift are to be provided with secondary power supplies.

16. LIFE SAFETY SYSTEMS CABLING

Cabling for fire safety systems is to comply with Table 1 of BS 8519:2020[12].

17. INTERNAL FIRE SPREAD (LININGS)

17.1 Material Classifications

Although unlikely to be the first materials to ignite, the wall and ceiling linings of an enclosure (such as a room) can have a dramatic effect on the development of a fire and, in particular, the time it takes for the room to become completely involved.

It is considered that the floor finishes do not significantly contribute to the development of a fire and are generally not controlled.

BS 9991 suggests that wall and ceiling linings should have the classification as shown in Table 4 below.

Location	European Class [(a)]
The internal linings within circulation spaces within dwellings	C-s3, d2
The internal linings within other circulation spaces and Protected Routes, including the common areas of blocks of flats [(b)]	B-s3, d2
Small rooms of area not more than $4m^2$ in residential portions	D-s3, d2
Garages (as part of a dwelling house) less than $40m^2$	D-s3, d2
Note: a) When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles. b) Large rooms such as enclosed car parks need not be regarded as circulation spaces even though there are circulation routes in them.	

Table 4: Classification of Linings in BS 9991

Freya recommends that Class 3 products should be avoided where possible.

[12] BS 8519:2020 – Selection and installation of fire-resistant power and control cable systems for life safety, fire-fighting and other critical applications. Code of practice.

18. INTERNAL FIRE SPREAD (STRUCTURES)

18.1 Structural Fire-Resistance

During a fire, it is important that the structure and key construction elements of a building remain fully functional for a reasonable period of time. It is obviously beneficial if these elements remain in a serviceable condition after the fire for ease of reinstatement.

BS 9991 suggests that all elements of a structure should be given the period of fire-resistance in respect of the criteria of loadbearing capacity, integrity and insulation when evaluated in accordance with the relevant parts of the following series of guidance documents: BS 476[13], BS EN 1363[14], BS EN 1364[15], BS EN 1365[16] or BS EN 1366[17].

With respect to fire-resistance periods for structural elements, the design of the building should be such that failure of one part will not lead to progressive collapse of another in the event of fire.

The fire-resistance period for structural elements should be not less than 60 minutes.

The fire-resistance of the fire-fighting shaft and fire-fighting stairs should be not less than 120 minutes.

18.2 Fire Separation and Compartmentation

18.2.1 General

A fire should be contained by fire-resisting elements of the building to prevent it spreading to other parts of the building. This containment should include voids and cavities that could provide a path for fire.

18.2.2 Apartments

The vertical and horizontal compartmentation between apartments should achieve a minimum of 60 minutes fire-resistance for integrity and insulation.

18.2.3 Protected Stairs

The fire-separation to the Protected Stairs within the building should achieve a minimum of 60 minutes fire-resistance for integrity and insulation.

18.2.4 Lift

The fire-resistance of the lift shaft should achieve at least 60 minutes fire-resistance for integrity and insulation.

18.2.5 Commercial Premises

The commercial premises should achieve a minimum of 60 minutes fire-resistance for integrity and insulation.

[13] BS 476 – Fire tests on building materials and structures.
[14] BS EN 1363 – Fire resistance tests.
[15] BS EN 1364 – Fire resistance tests for non-load bearing elements.
[16] BS EN 1365 – Fire resistance tests for loadbearing elements.
[17] BS EN 1366 – Fire resistance tests for service installations.

18.2.6 Plant Rooms

The plant rooms should achieve a minimum of 60 minutes fire-resistance for integrity and insulation.

18.2.7 Service Risers

All service risers should achieve the same level of fire-resistance as any compartment lines that they pass through. Therefore, the service risers should achieve a minimum of 60 minutes fire-resistance for integrity and insulation.

18.2.8 Glazing

If the smoke separation involves glazing, the glazing should be capable of demonstrating the same minimum level of fire-resistance as that of the compartment walls or fire doors into which it is fitted.

18.3 Fire Doors

18.3.1 Apartment Entrance Doors

Apartment Entrance Doors should be to a minimum FD30S standard, fitted with intumescent strips and cold smoke seals. The doors should be capable of self-closing.

18.3.2 Duplex Apartment Protected Stairs

Doors onto the Protected Stairs within a duplex apartment should be to a minimum FD30 standard.

18.3.3 Apartment Common Protected Escape Routes

Cross-corridor doors and doors onto the Protected Stairs should be to a minimum FD30S standard, fitted with intumescent strips and cold smoke seals and should be capable of self-closing. The doors should be fitted with signage stating, 'Fire Door Keep Closed'.

18.3.4 Service Risers

Service Riser doors should be to a minimum of FD 30 standard and should be kept locked at all times. The doors should be fitted with signage stating, 'Fire Door Keep Locked'.

18.4 Service Penetrations

18.4.1 Overview

All openings through compartment walls and floors should be kept as small as possible. Pipes, cables, conduits etc. should be fire-stopped by filling around the breach with a proprietary sealant able to achieve the same fire rating as the relevant compartment wall or floor. All pipes over 40mm diameter (or 160mm diameter if non-combustible) should be provided with an approved intumescent collar, which should be fitted within the compartment wall or floor.

18.4.2 Small Gaps

Where small gaps are formed around services of up to 30mm (depending on the product used), an intumescent mastic may be an appropriate method of fire-stopping. For larger gaps, a fire-rated foam may be more appropriate. Products to be used for the proposed remedial works should be tested and certified as being appropriate for the particular aperture and should be installed in line with manufacturer's recommendations. A typical detail of this is indicated in Figure 16.

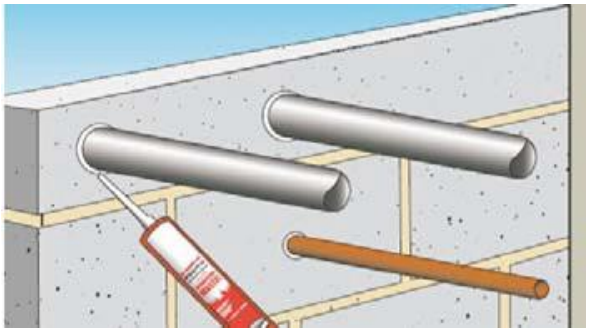


Figure 16:Typical small gap fire-stopping detail

18.4.3 Small to Medium Sized Openings

Where small to medium sized openings are formed around services, a Rockwool Ablative Coated Batt (or similar) could be used to seal the opening. Products to be used for the proposed remedial works should be tested and certified as being appropriate for the particular aperture and should be installed in line with manufacturer's recommendations. A typical detail of appropriate fire-stopping for small to medium sized openings is indicated in Figure 17.

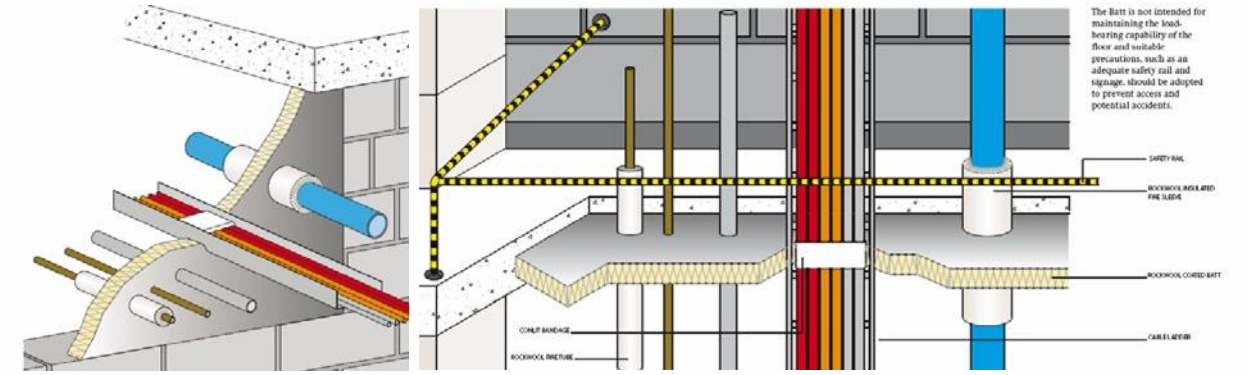


Figure 17: Typical small to medium sized opening fire-stopping detail

18.4.4 Medium to Large Sized Openings

Where medium to large sized openings are formed around services, a Rockwool Firestop Compound (or similar) should be used to seal the opening. Products to be used for the proposed remedial works, should be tested and certified as being appropriate for the particular aperture and should be installed in line with manufacturer's recommendations. A typical detail of appropriate fire-stopping for medium to large sized openings is indicated in Figure 18.

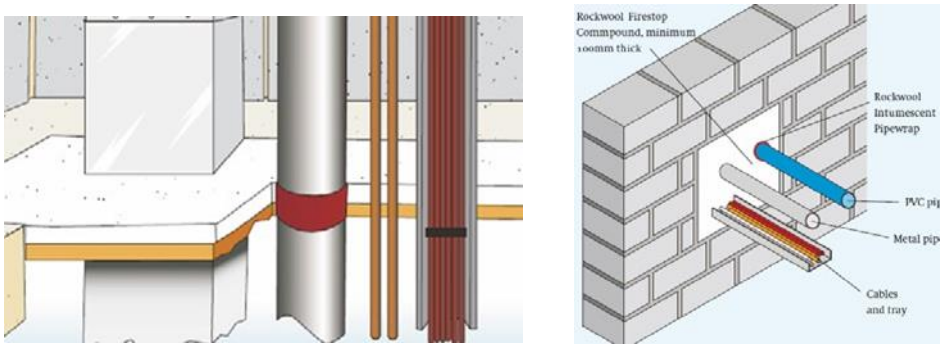


Figure 18: Typical medium to large sized opening fire-stopping detail

18.4.5 Expansion Joints in Compartment Walls

Where expansion joined are formed in fire-rated walls, a proprietary Rockwool Expansion Joint (or similar) should be used. Products to be used for the proposed remedial works should be tested and certified as being appropriate for the particular aperture and should be installed in line with manufacturer's recommendations. A typical detail of this is indicated in Figure 19.

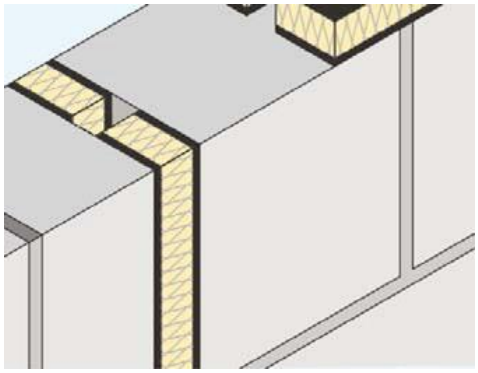


Figure 19: Expansion joint fire-stopping detail

18.4.6 Cable Trays and Trunking

Cable trays and cables should be tightly sealed around them. Alternatively, to allow for future pulling of new cables etc., consideration could be given to the use of the Rockwool Multi Cable FireStop or intumescent bags (or similar). These should also be used in trunking that passes through compartmentation. Products to be used for the proposed remedial works should be tested and certified as being appropriate for the particular aperture, and should be installed in line with manufacturer's recommendations. A typical detail of appropriate fire-stopping is indicated in Figure 20.

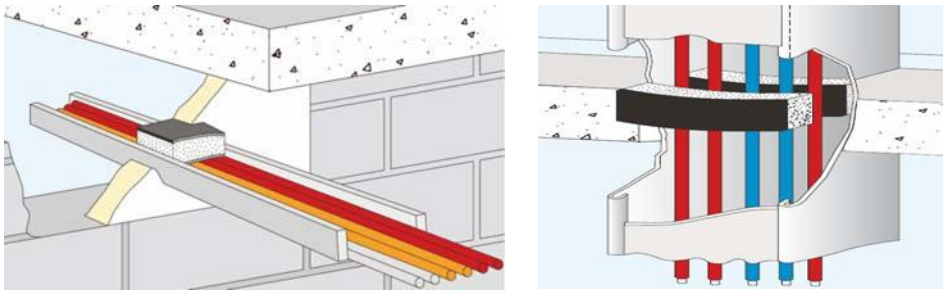


Figure 20: Cable tray/trunking infill fire-stopping detail

18.4.7 Ventilation Ductwork

Ventilation ductwork should be fire-stopped in line with the recommendations of Approved Document B and BS 9991.

All works carried out to the elements of the structure forming the fire compartmentation within the building should be carried out and certified in accordance with the requirements of the Building Regulations 2010 (as amended).

18.5 Cavity Barriers

If there are new cavities created, then cavity barriers are to be provided in accordance with Paragraph 25.1 and Figure 40 of BS 9991 (reproduced in Figure 21 below).

Cavity barriers should be provided to close the edges of cavities, including around openings. Cavity barriers should also be provided at:

- The junction between an external cavity wall *(except where the cavity wall is as shown in Figure 22)* and every compartment floor and compartment wall; and
- The junction between an internal cavity wall *(except where the cavity wall is as shown in Figure 22)* and every compartment floor, compartment wall, or other wall or door assembly which forms a fire-resisting barrier.

It is important to continue any compartment wall up through a ceiling or roof cavity to maintain the standard of fire-resistance. Therefore, compartment walls should be carried up full storey height to a compartment floor or to the roof as appropriate. It is, therefore, not appropriate to complete a line of compartmentation by fitting cavity barriers above the compartment wall.

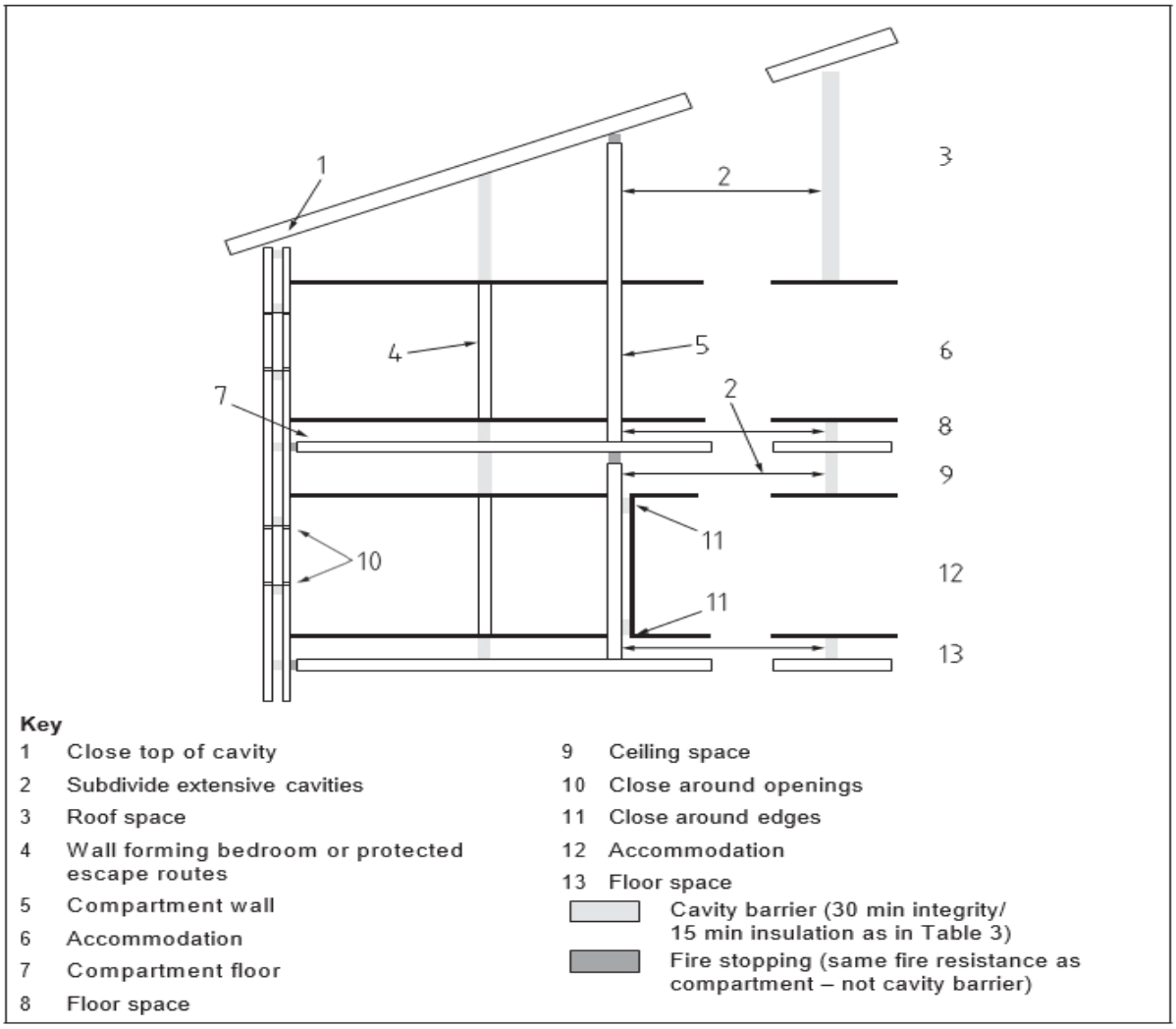


Figure 21: Provisions for cavity barriers

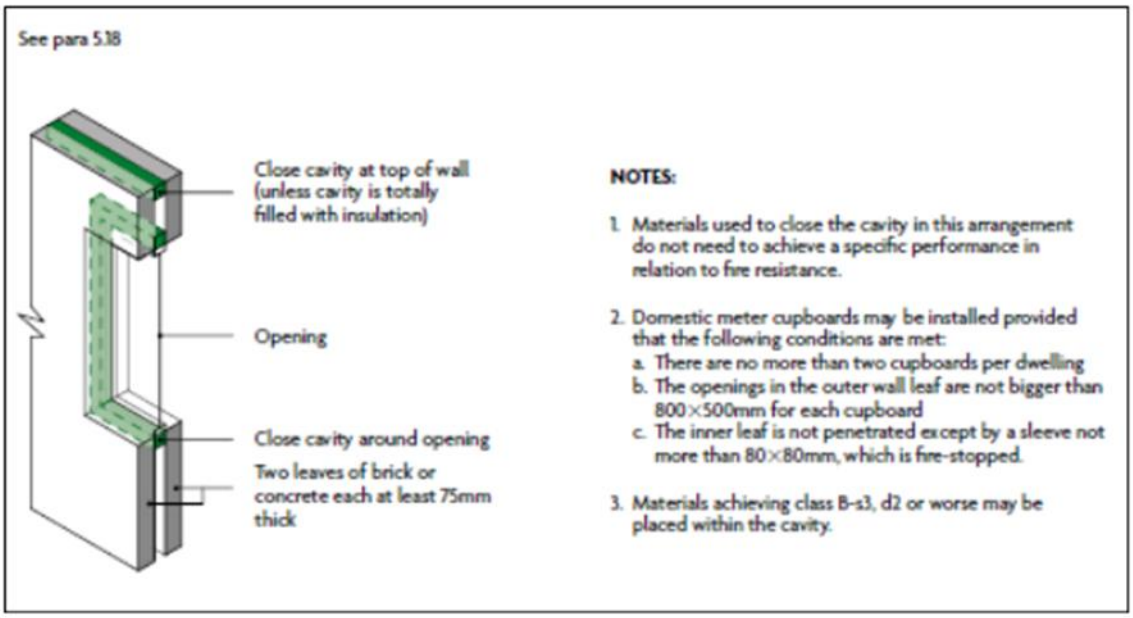


Figure 22: Cavity walls excluded from the provisions for cavity barriers

To prevent extensive cavities, raised floors and concealed cavities (i.e. the void between a suspended ceiling and the soffit of the floor above) that are used for services, etc. will require cavity barriers typically installed so as to observe a 20m maximum linear dimension. This includes cavities in external walls where compartment walls or floors are above the external wall.

Where cavities exist above or below partition walls of bedroom enclosures, those cavities should either be:

a) Fitted with cavity barriers in line of the partitions; or

b) For cavities above the partitions, enclosed on the lower side by a fire-resisting ceiling which extends throughout the building, fire compartment or fire-separated part.

All pipes, ductwork and services passing through fire-resisting barriers should be penetration-sealed with an appropriate sealing system *and/or* fire/smoke damper which has demonstrated (by an appropriate test or assessment) to maintain the required fire-resistance period of the barrier. The penetration sealing system should be designed and installed in accordance with the recommendations contained within the IFSA Code: Sealing Apertures and Service Penetrations to Maintain Fire Resistance.

18.6 Roof Coverings

The performance of roof coverings to prevent fire spread is based on the separation distance from the roof to a boundary as recommended in Paragraph 24.6.1 and Table 11 of BS 9991 as reproduced in Figure 23 below.

Table 11 — *Separation distances for roof coverings*

Classification of covering of roof or part of roof[A]	Distance of roof from any point on relevant boundary			
	Less than 6 m	At least 6 m	At least 12 m	At least 20 m
B_{ROOF}(t4)	Acceptable	Acceptable	Acceptable	Acceptable
C_{ROOF}(t4)	Not acceptable	Acceptable	Acceptable	Acceptable
D_{ROOF}(t4)	Not acceptable	Acceptable[B], [C]	Acceptable[B]	Acceptable
E_{ROOF}(t4)	Not acceptable	Acceptable[C]	Acceptable	Acceptable
F_{ROOF}(t4)	Not acceptable	Not acceptable	Not acceptable	Acceptable[C]

NOTE 1 *Unwired glass at least 4 mm in thickness has a B_{ROOF}(t4) classification.*

NOTE 2 *See 24.6.2 for limitations on plastic roof lights.*

[A] The performance of roof coverings is classified in accordance with BS EN 13501-5:2016.

[B] Not acceptable on buildings with a volume of more than 1 500 m^3.

[C] Acceptable on buildings not listed in Footnote B, if part of the roof is no more than 3 m^2 and is at least 1.5 m from any similar part, with the roof between the parts covered with class A2-s3, d2 or better materials.

Figure 23: Reproduction of Table 11 of BS 9991

Based on the distance to the boundaries the roof coverings should achieve a minimum performance of class B_{Roof}(t4) or better.

19. EXTERNAL FIRE SPREAD

The external wall finishes influence fire propagation to the external face of a building, which can prove hazardous to the occupants and Fire Service.

The surface spread of flame performance for the external surfaces of walls should be as stated in Table 5 below. This includes wall and ceiling linings to balconies that are enclosed or partially enclosed.

Building Height	Less than 1000m from the Relevant Boundary	1000mm or More from the Relevant Boundary
More than 11m	Class A2-s1, d0(1) or better	Class A2-s1, d0(1) or better
Less than 11m	Class B-s3, d2(2) or better	No provisions
Notes (1) The restrictions apply to all the materials used in the external wall and specified attachments. (2) Profiled or flat steel at least 0.5mm thick with an organic coating of no more than 0.2mm thickness is also acceptable.		

Table 5: Classification of External Wall Surfaces

Where a building contains residential accommodation and has a storey level of 11m or more in height, any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar) etc. used in the construction of an external wall should be class A2-s1, d0 or better. This restriction does not apply to masonry cavity wall construction, as shown in Figure 22 of Section 18.5 of this strategy. Where regulation 7(2) applies, that regulation prevails over all the provisions in this paragraph.

19.1 Fire Spread via the External Walls

When a building is burning, heat will radiate through non-fire-resisting openings in the external walls. This heat can be intense enough to cause ignition to adjoining buildings or combustible material therein.

In order to reduce the chance of this occurring, the Building Regulations place limits on the area of external elevation with no fire-resistance. This area is known as the 'unprotected area' and is affected by such factors as distance from the boundary, use of the building and compartment size.

The conventional approach for analysing the risk of external fire spread from one building to another is detailed in BR 187:2014[18] which takes the approach assuming that:

- A fire has spread throughout the full extent of any fire compartment (i.e. full flashover fire throughout the compartment);
- Any non-fire-rated parts of the external wall have failed; and
- The heat and flames are radiating from the entire façade.

Therefore, the pre-determined calculations for unprotected areas provided in Tables A to C of BR 187 have been used to determine the unprotected areas. As the building is provided with Automatic Water Fire Suppression Systems, the allowed 50% reduction in distance is to be applied.

Boundary locations are taken as the centre of a public highway, the boundary of the site or a notional boundary mid-way between buildings on the same site.

[18] BR 187:2014 – External fire spread: building separation and boundary distances.

19.1.1 North Elevation

The north façade faces onto the neighbouring library. Up to the 2nd floor level the notional boundary is 1m.

The commercial premises at ground floor level forms an enclosed rectangle of 3m high by 13m wide. This would allow 40% of this façade to be unprotected for a commercial premises with a 3m high by 15m wide enclosure.

The 1st and 2nd floors face onto the neighbouring library. The largest enclosing rectangle for these floors on this elevation is 3m high by 8m wide. This would allow 50% of this façade to be unprotected for a residential apartment with a 3m high by 9m wide enclosure.

For the 3rd to 5th floors the façade does not face onto a neighbouring building within 2.5m. The largest enclosing rectangle for these floors is 6m high by 5m wide, which would allow 100% of the façade to be unprotected for apartments with a 6m high by 5m wide enclosure.

19.1.2 East Elevation

The east façade faces directly onto neighbouring properties.

The duplex apartment over ground and mezzanine levels is within 1m of the neighbouring property and should, therefore, achieve a minimum of 60 minutes fire-resistance for integrity and insulation.

For the 1st to 2nd floor levels, the largest enclosing rectangle on this elevation is 3m high by 11m wide. The distance to the notional boundary is in excess of 2m which would allow 100% of the façade to be unprotected for apartments with a 3m high by 12m wide enclosure.

For the 3rd to 5th floors the façade does not face onto a neighbouring building within 2.5m. The largest enclosing rectangle for these floors on this elevation is 6m high by 5m wide which would allow 100% of the façade to be unprotected for apartments with a 6m high by 5m wide enclosure.

19.1.3 South Elevation

The south façade faces onto neighbouring properties. The largest enclosing rectangle on this elevation is 6m high by 9m wide. The distance to the notional boundary is 1.5m which would allow 50% of the façade to be unprotected for apartments with a 6m high by 9m wide enclosure.

19.1.4 West Elevation

The west façade faces onto the public road. The distance to the notional boundary is in excess of 5m.

The commercial premises at ground floor level is an enclosing rectangle of 9m wide by 3m high. This would allow 100% of this façade to be unprotected for a commercial premises with a 3m high by 9m wide enclosure.

For the 1st to 5th floors the largest enclosing rectangle for these floors on this elevation is 6m high by 13m wide which would allow 100% of the façade to be unprotected for apartments with a 6m high by 15m wide enclosure.

20. ACCESS AND FACILITIES FOR THE FIRE SERVICE

The Fire & Rescue Service (F&RS) is provided access to the building via Shepherds Bush Road.

20.1 Dry Rising Mains

As it is not possible to reach all areas of the apartments within 60m, and as there is no storey level over 50m, a Dry Rising Main is required.

Fire-fighting appliances will be able to get to within 18m of the Dry Rising Main inlets, which should be located at the entrance point. The location of the inlet should be readily visible from where it is perceived a fire-fighting appliance will stop.

The Dry Rising Main systems provided for the site should be designed to BS 9990:2015[19]. Landing valves are to be located within the enclosure of the Protected Stairs. Whenever possible, landing valves should be located on each full landing within the staircase. However, consultation with the local Fire and Rescue Service (F&RS) may allow for landing valves to be on half-landings.

20.2 Fire-Fighter Access

External doors providing access to the building should be openable by the F&RS upon arrival. This should include fire-fighters override switches for any secured doors.

20.3 Vehicle Access

The minimum width of road between kerbs should be 3.7m to allow access for both fire-fighting appliances and a high reach.

As the vehicle weight of a high reach appliance (which is the most onerous weight) is capable of being distributed over a number of axles, the access roads should be designed to a minimum load capacity of 14 tonnes to support this. As this is an existing access road it is reasonable to presume these requirements are already met.

A fire appliance should not have to reverse more than 20m before turning facilities are made available. There are sufficient means provided to allow for fire appliances to leave the area without the need for reversing.

20.4 Wayfinding Signage

Signage is to be provided at the residential entrance to the apartment block stating the building name and the apartments located within.

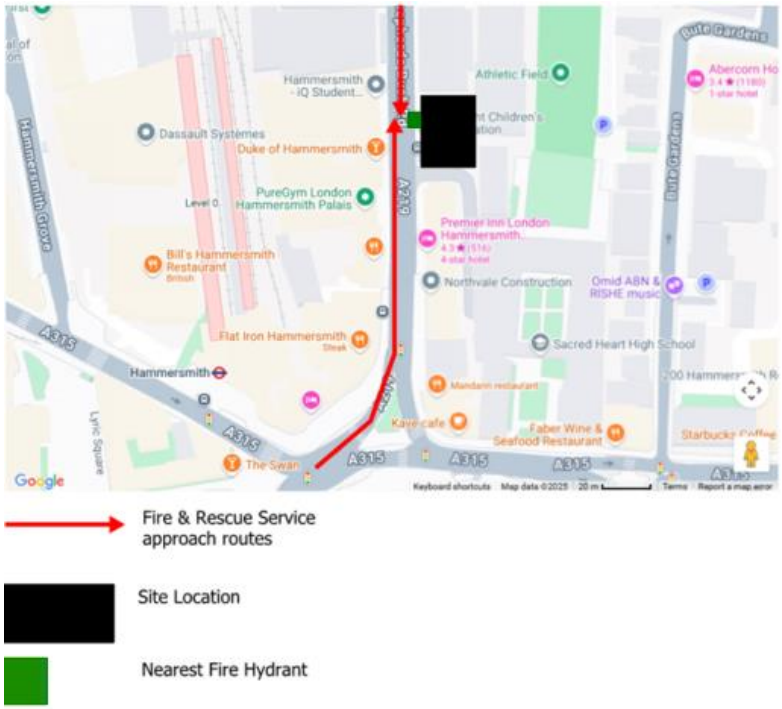
Signage is to be provided at every landing level within the staircase (at each storey level) stating the floor level and the apartments accessed at that level.

[19] BS 9990:2015 – Non automatic fire-fighting systems in buildings. Code of practice.

20.5 Fire Hydrants

Fire hydrants are to be provided within 90m of the position where it can reasonably be expected that a fire appliance will stop.

The location of the nearest fire hydrant (in green) in conjunction to the proposed development site (in black) is shown in Figure 24 below with the nearest hydrant being within 90m.



Fire & Rescue Service approach routes

Site Location

Nearest Fire Hydrant

Figure 24: Fire hydrant locations

21. CONCLUSION

BS 9991 has been used as a performance benchmark during the development of this fire safety strategy along with BS 9999.

Where design consistency with this report can be verified, it is the opinion of Freya that the proposal is capable of demonstrating compliance with the requirement of Part B of the Building Regulations 2010 (as amended) and that a satisfactory standard of fire safety can be achieved. This is subject to all works being designed, constructed and operated in accordance with this fire safety strategy.

22. LIMITATIONS

Our advice is strictly limited to the scope of our current brief, i.e. to create a fire strategy for the proposed residential development at 227 Shepherds Bush, London W6 7AS.

It is assumed that all the fire safety measures recommended in all other completed reports have been implemented.

Freya Comprehensive Fire Solutions Ltd have not reviewed any other issues within the project other than those identified in our report. We offer no comment on the adequacy or otherwise of any other aspects of the development (whether related to fire safety or any other issue) and any absence of comment on such issues should not be regarded as any form of approval. The advice should not be used for buildings other than that named in the title.

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