



Fire Safety Strategy Report

Site Address: Paddockhurst Road, Turners Hill, Crawley, RH10 4SD

Client: Worth Abbey

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1 Introduction

Worth Abbey has appointed Osborn Associates Limited (OAL) to provide fire engineering consultancy services, including the preparation of this fire strategy for the newly proposed library, Narthex, welcome centre and piazza of Paddockhurst Road, Turners Hill, Crawley, RH10 4SD.

A site visit was carried out on the property on 7 May 2025.

This report documents the fire strategy using the current regulations in order to provide information on safety concerns and recommendations on how to achieve fire safety for the current standards for the area of the building affected by works. No base build fire strategy information on products installed within the premises has been provided.

This fire safety strategy has been developed based on the guidance of BS 9999:2017 Fire Safety in design, management and use of buildings - Code of Practice (BS 9999:2017). Where departures from the prescriptive design basis exist, other fire engineering principles are employed to support alternative solutions in the fire safety design and the proposals are documented.

This strategy report has not primarily been developed to address property protection. However, the features that are included for life safety will contribute to some extent to business and property protection. Apart from where noted in this report, the designs will be in accordance with the recommendations of BS 9999:2017 guidance for life safety and the documents referenced therein.

All aspects of the fire safety design will be subject to review and approval by the Building Control Body and the West Sussex Fire and Rescue Service to which this report and all subsequent versions and relevant design matters are considered, assessed, and controlled through a Works Authorisation Process.

Table 1 - Key Fire Safety Information

Requirements	Provision	Reference
Guidance Used	BS 9999:2017 Fire safety in design, management and use of buildings - Code of practice.	Section 4
Building Description and Risk Profile	The Paddockhurst Road, Turners Hill is an existing church building composed of a ground and one upper floor of a library and assembly space containing a café and bookshop. A basement level is provided however, it is outside of the scope of this report. Risk profiles: - B2 for cafe and new welcome centre, - B3 for the library. The church area is outside the scope of this report.	Sections 3 & 4
Building Height	3.2 m	Section 3

Requirements	Provision	Reference
Evacuation Strategy	Simultaneous evacuation	Section 5.1
Automatic Fire Detection and Alarm Systems	Welcome Centre and Café - Category L2 automatic fire detection and alarm system in line with BS 5839-1:2017. Library - Category L2 automatic fire detection and alarm system in line with BS 5839-1:2017.	Section 6.2
Automatic Fire Suppression	No automatic suppression systems have been provided within the property other than in a server room on the third floor.	Section 6.1
Structural Fire Resistance	60 minutes.	Section 7.2
External Wall Construction	The external wall of the building is to remain unchanged as part of these works.	Section 0
Roof Covering	The roof of the building is to remain unchanged as part of these works.	Section Error! Reference source not found.
Firefighting Access	Access is provided to 15% of the building perimeter.	Section 9

2 Legislation Applicable

This Fire Strategy Report outlines the proposed fire safety strategy for the existing Paddockhurst Road, Turners Hill, Crawley, RH10 4SD. This report aims to set out and detail the fire safety principles that will be present upon the building's occupation.

2.1 Relevant Legislation

The building and safety measures described in this fire strategy will need to satisfy the relevant provisions of the following fire-related legislation:

- The Building Regulations 2010 as amended 2018 and 2022
- Regulatory Reform (Fire Safety) Order 2005
- Statutory Consultation
- Regulation 7
- Regulation 38

2.2 The Building Regulations 2010 as amended

The Building Regulations, produced under the Building Act 1984, is the primary legislation controlling building work and applies to most new or materially altered buildings.

Part B of Schedule 1 to the Building Regulations includes five functional requirements:

- Regulation B1 Means of Warning and Escape
- Regulation B2 Internal Fire Spread (Linings)
- Regulation B3 Internal Fire Spread (Structure)
- Regulation B4 External Fire Spread
- Regulation B5 Access and Facilities for the Fire Service

This fire strategy and plans issued by the Architect are intended to demonstrate full compliance with the above regulations.

2.3 Regulatory Reform (Fire Safety) Order 2005

The Fire Safety Order (RRFSO) is the primary piece of legislation relating to fire safety in occupied, non-domestic premises (including the common areas of the apartment blocks) and is usually enforced by the local fire authority.

The responsibility of ensuring that the requirements of the Order are met rests with the Responsible Person, who must undertake a risk assessment to identify the fire precautions he/she need to take.

2.4 Statutory Consultation

During the Building Regulations application process, the building control body is required to formally consult with the local fire authority. This consultation gives the fire authority the opportunity to make observations regarding the Building Regulations and informs the applicant of any action that may have to be taken to meet the requirements of the Fire Safety Order.

The consultation should allow both parties to reach mutually compatible views on whether the building meets the requirements of both pieces of legislation. In the exceptional event that the fire authority requires physical changes to be made to the building to meet the requirements of the Fire Safety Order, the building control body should make the applicant aware.

2.5 Fire Risk Assessment

A fire risk assessment is now required for virtually all non-domestic premises. In many instances, the significant findings of this assessment are to be recorded. Furthermore, the onus on proving what reasonable fire safety measures should be provided lies with the person responsible for the building, not the enforcing authority.

According to PAS 79—Fire Risk Assessment—Guidance and a Recommended Methodology, a risk assessment can only be validly carried out when a building is in normal use.

However, it should be noted that there is no grace period between occupation and completion of the risk assessment, and thus, failure to undertake a risk assessment prior to occupation could constitute a breach of legislation. OAL is, therefore, of the opinion that a pre-occupation risk assessment is essential to assist the responsible person in fulfilling their legal obligations.

The Building Regulations do not specifically require a risk assessment. However, risk assessment is at the core of developing a fire strategy, thereby ensuring that the measures provided in the building reflect the risk presented by that building's intended use.

2.6 Regulation 7 - Material and Workmanship

Regulation 7 of the Building Regulations requires that all building work be carried out in a workmanlike manner, with adequate and proper materials appropriate for the circumstances in which they are used, adequately mixed and prepared, and applied, used, or fixed so as to perform the functions for which they are designed. Further guidance is provided in the Approved Document B (ADB) supporting Regulation 7.

Independent certification schemes exist to provide additional confidence that products are manufactured and installed to an appropriate and consistent standard. It is therefore suggested that, where applicable, manufacturers and installers subject to independent certification schemes be specified on this scheme.

2.7 Regulation 38

Regulation 38 of the Building Regulations requires fire safety information for a new or altered building to be passed to the responsible person at the completion of the project or on occupation, whichever comes sooner.

This requirement aims to provide the responsible person with appropriate information to assist them in operating and maintaining the building in reasonable safety.

This information can, therefore, assist the responsible person in undertaking a risk assessment to meet the requirements of the Fire Safety Order.

As the developer of the fire strategy, OAL is well-placed to produce the information to meet these requirements. This will ensure a smooth transition between the design stage and the safe occupation of the completed building.

3 Building Description

The Paddockhurst Road, Turners Hill is an existing church composed of a basement level, ground and 1 upper floor of ancillary use, which is to be used as a library. The height of the top occupied floor of the building above the adjacent ground level is 3.2 m.

The upper level is to be provided for use as a library. The front of the church will be renovated to provide a welcome centre and café with a seating area and a book shop. The main church area is out of the scope for the context of this report.

The building has been provided with a basement level, which is outside the scope of this report. No plans have been provided at this level.

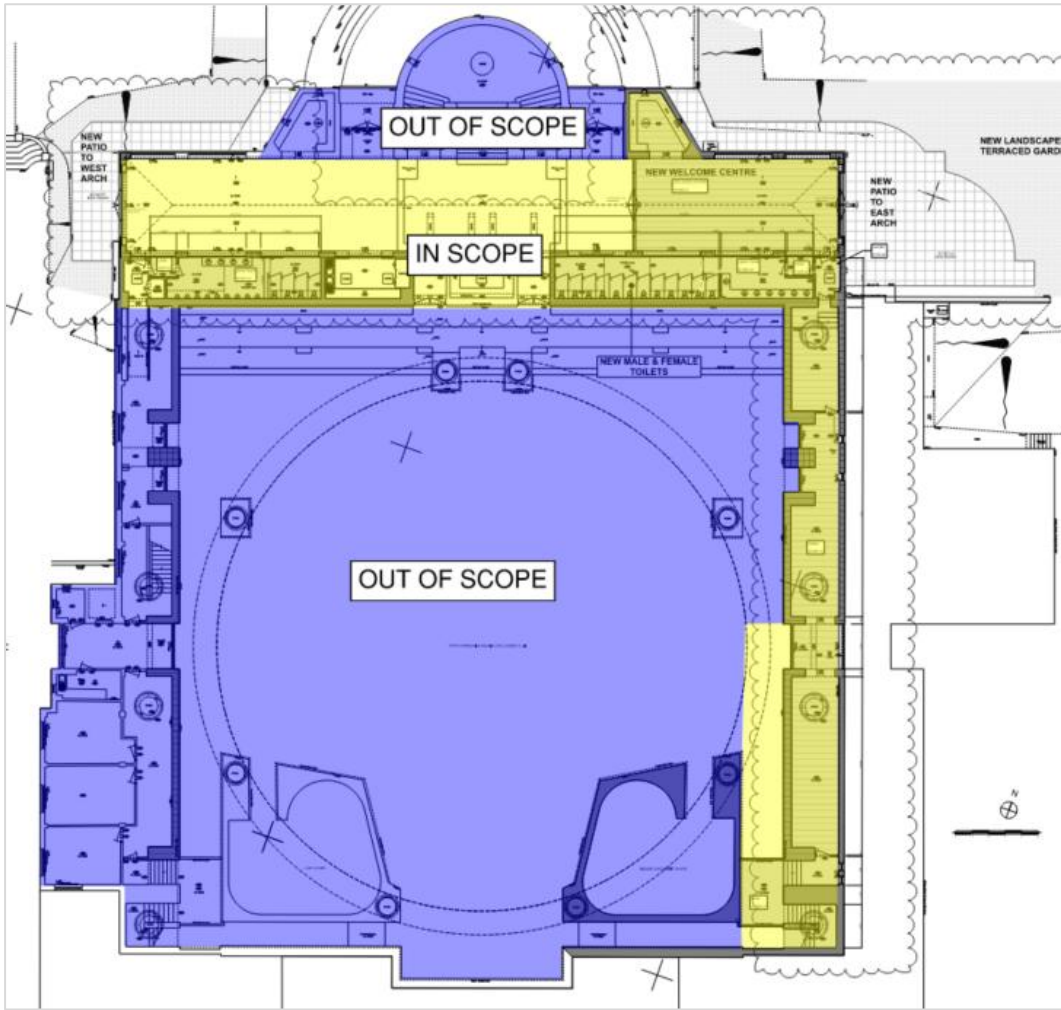


Figure 1 – Building layout

4 Guidance Used and Building Risk Profile

The fire strategy for the building is designed according to BS 9999:2017 Fire safety in design, management and use of buildings - Code of practice (BS 9999:2017).

4.1 Building Risk Profile

As part of the approach taken from BS 9999:2017, a risk profile of the premise is to be established which will form the basis of the fire safety design of this building. The following assessment is made of the occupancy characteristic and the fire growth rate within this building.

4.2 Occupancy Characteristic

The occupancy characteristic is principally determined according to whether the occupants are familiar or unfamiliar with the building and whether they are likely to be awake or asleep.

The occupancy characteristic applicable to this building, as per Table 2 in BS 9999:2017, is noted in Table 2.

The building will be available to members of the public and students of the nearby Worth Abbey School.

Table 2 - Occupancy Characteristic According to BS 9999:2017

Occupancy Characteristic	Description
B	Occupants who are awake and unfamiliar with the building

4.3 Fire Growth Rate

The fire growth rate is the rate at which it is estimated that a fire will grow, given the typical use of the building. The fire growth rate is categorised in accordance with Table 3, BS 9999:2017. The resulting fire growth rate is given in Table 3.

Table 3 - Fire Growth Rate According to BS 9999:2017

Area	Category	Fire Growth Rate	Fire Growth Parameter	Description
Café/Concourse	2	Medium	0.012 kJ/s	Evenly distributed low to mid-level fire load comprising a mix of combustible materials.
Library	3	Fast	0.047 kJ/s	Stacked combustibles (on or off racking and shelving but excluding high rack storage), some small quantities of materials other than materials of limited combustibility, process, manufacturing or storage of combustible materials.

4.4 Resulting Risk Profile

The risk profile is given as a combination of occupancy characteristics and fire growth rate. Therefore, from Table 2 and Table 3, the risk profile is B2 for the café and concourse area, B3 for the library, as shown in Table 4.

Table 4 - Occupancy Characteristic According to BS 9999:2017

Area	Occupancy Characteristic	Fire Growth Rate	Risk Profile
Café/Concourse	B	2	B2
Library	B	3	B3

5 Means of Escape

5.1 Evacuation Strategy

The evacuation strategy employed in the building is a simultaneous evacuation. The principle of this strategy is that upon detection of smoke or fire, all occupants are prompted to immediately leave the building. The fire detection and alarm system will signal the evacuation of the building on the activation of a single smoke detector, heat detector or manual call point.

5.2 Travel Distances

Travel distances within the building should be limited to the distances outlined in BS 9999:2017 guidance, as summarised in Table 5.

The travel distances noted in Table 5 consider a 15% increase due to the provision of a Category L2 automatic fire detection and alarm, which is a higher standard than the minimum of manual detection that would be required within the building, in line with BS 9999:2017 guidance.

Table 5 – Travel Distance Limits

Risk profile	Travel Distance in a Single Direction (m)		Travel Distance Where Alternative Escape Routes are Available (m)	
	Direct	Actual	Direct	Actual
B2	14.9 m	23 m	37.9 m	57.5 m
B3	12.6 m	18.4 m	31 m	46 m

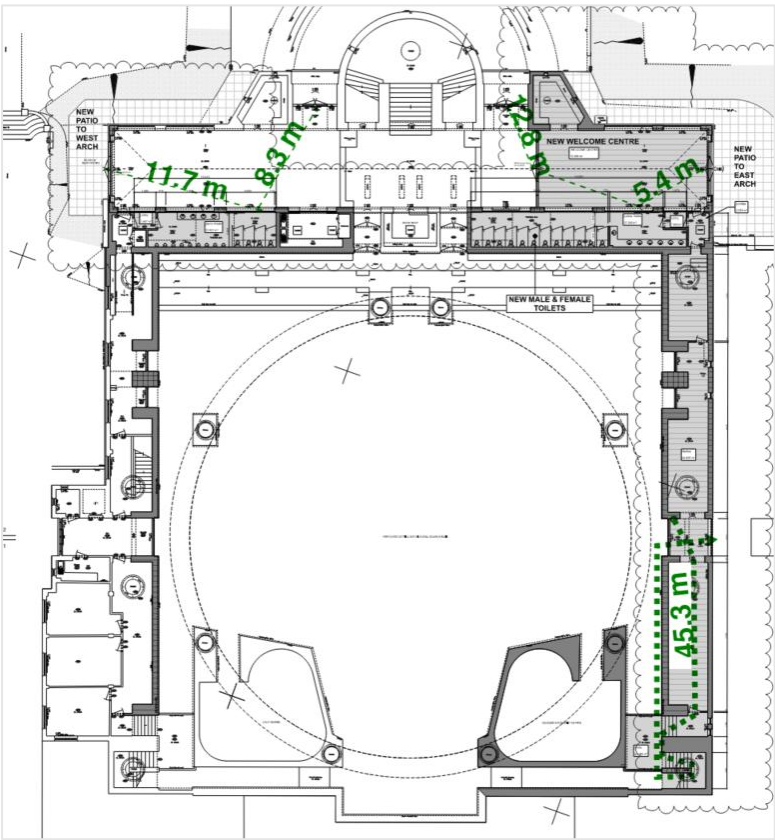


Figure 2 – Travel Distances

Travel distances are generally in line with the recommendations of BS 9999:2017, as noted in Table 5. Upon occupation, if floor plans are divided such that each exit serves a separate occupancy, the above travel distances should be assessed to ensure all distances are within the maximum allowed stated above.

5.3 Horizontal Escape Capacity

The horizontal escape capacity from the building will be assessed based on the escape width requirements in line with BS 9999 guidance. The minimum number of escape routes should be as per guidance in Table 6 below.

Table 6 - 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

The horizontal escape capacity from the building will be assessed in line with BS 9999:2017 guidance based on the escape width requirements. Therefore, the escape capacity provided by each exit will be assessed as follows:

$$N = W_e/m$$

where: N - number of persons safely accommodated by the door width
W_e - width of the exit, mm
m - minimum door width, mm/person

Where a door width is less than 1050 mm, the number of persons accommodated by that exit will be calculated assuming W_e = 500 mm.

The horizontal escape capacity provided by the building is presented in Table 7. The minimum door width used for the assessment of the horizontal escape capacity considers the 15% reduction in the minimum door width per person required due to the provision of an L2 automatic fire detection and alarm throughout the building. The exits highlighted in red are discounted as per BS 9999:2017 recommendations.

Table 7 – Horizontal Escape Capacity

Level	Exit	Exit Width [mm]	Minimum Door Width [mm/person]	Escape Capacity	Total Escape Capacity
Library	Library Exit 1	750	5.1	60 ^[1]	60
	Library Exit 2	750	5.1	60 ^[1]	
Concourse/Café	Exit 1	1800	3.485	516	2137
	Exit 2	1800	3.485	516	
	Exit 3	1800	3.485	516	
	Exit 4	1800	3.485	516	
	Exit 5	1800	3.485	516	
	Exit 6	1800	3.485	73 ^[2]	

[1] The maximum occupancy is limited to 60 people due to the door opening against the direction of escape.
[2] This exit is limited due to the merging flow from the library

It should be ensured that the total occupancy of each floor does not exceed the relevant total escape capacity stated in Table 7 throughout the life of the building. However, the total capacity of all the upper floor levels will also need to not exceed the escape capacity noted in Table 8.

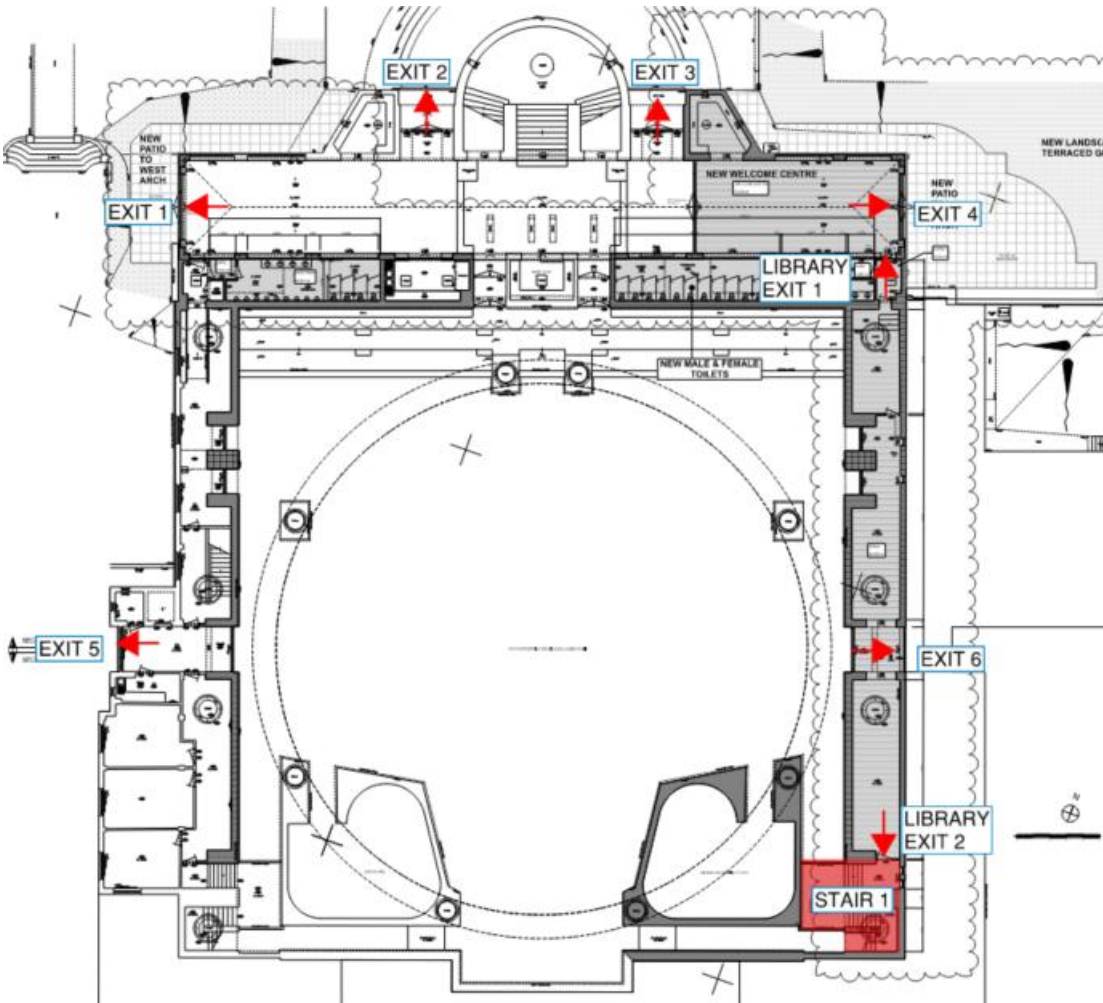


Figure 3 – Exits from the building

It is recommended that the library be provided with additional fire rated doors to separate both means of escape from each other. This will provide occupants with a place of relative safety in the event of fire, to ensure occupants have sufficient time to make their escape. See below an indicative location for the proposed additional door. The doors should achieve a fire resistance of E30Sa. This is no guidance in BS 9999 recommending an additional door; however, the provision of the door separation will ensure the protection of at least one escape route in the event of fire. Due to the high fire load, a relatively narrow room, this is the most practical solution given the conditions present. The door may be held open by a magnetic lock.

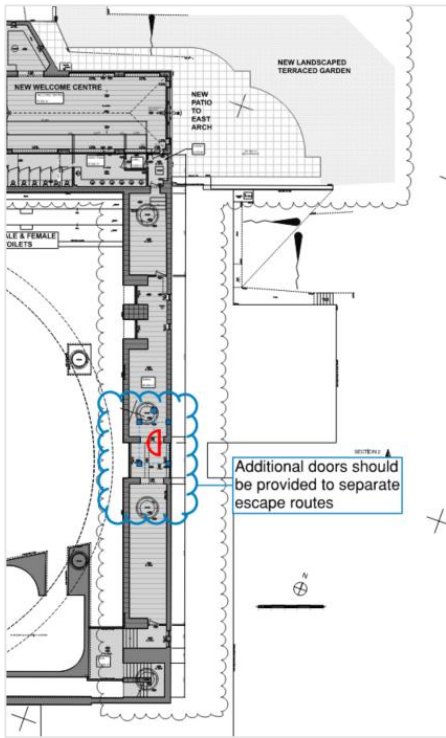


Figure 4 - Additional doors to separate escape routes

5.4 Vertical Escape Capacity

The concourse and café are provided with direct and level access to a place of ultimate safety.

The library is served by one stair as shown in Figure 5. The stair does not discharge directly to external, nor does it discharge via a protected corridor. This is deemed acceptable due to the existing nature of the building and the assumption that a fire will only be present in one location. Therefore, if a fire were to be present in the church, occupants of the library could exit via 1 of the exits located within the café and concourse.

Similarly, if the fire is present in the library, occupants will have an escape route via the church area, which has been confirmed as having a suitable capacity to accommodate occupants from within the church and occupants escaping from the library fire.

The vertical escape capacity calculation per stair is presented in Table 8. The presented stair width requirement considers a 15% reduction to the required width per person due to the provision of an L2 standard of automatic fire detection.

Table 8 – Vertical Escape Capacity from Upper Floors

Stair	Stair Width [mm]	No. of Levels Served	Stair Width per Person [mm/person]	Stair Capacity	Total Escape Capacity
Stair 1	1100	1	5.95	60 ^[1]	60

[1] This stair is limited to 60 by the door opening against the direction of escape at first floor level.

Based on Table 7 – Horizontal Escape Capacity and Table 8 – Vertical Escape Capacity from Upper Floors the maximum capacity should be limited to 60 persons.

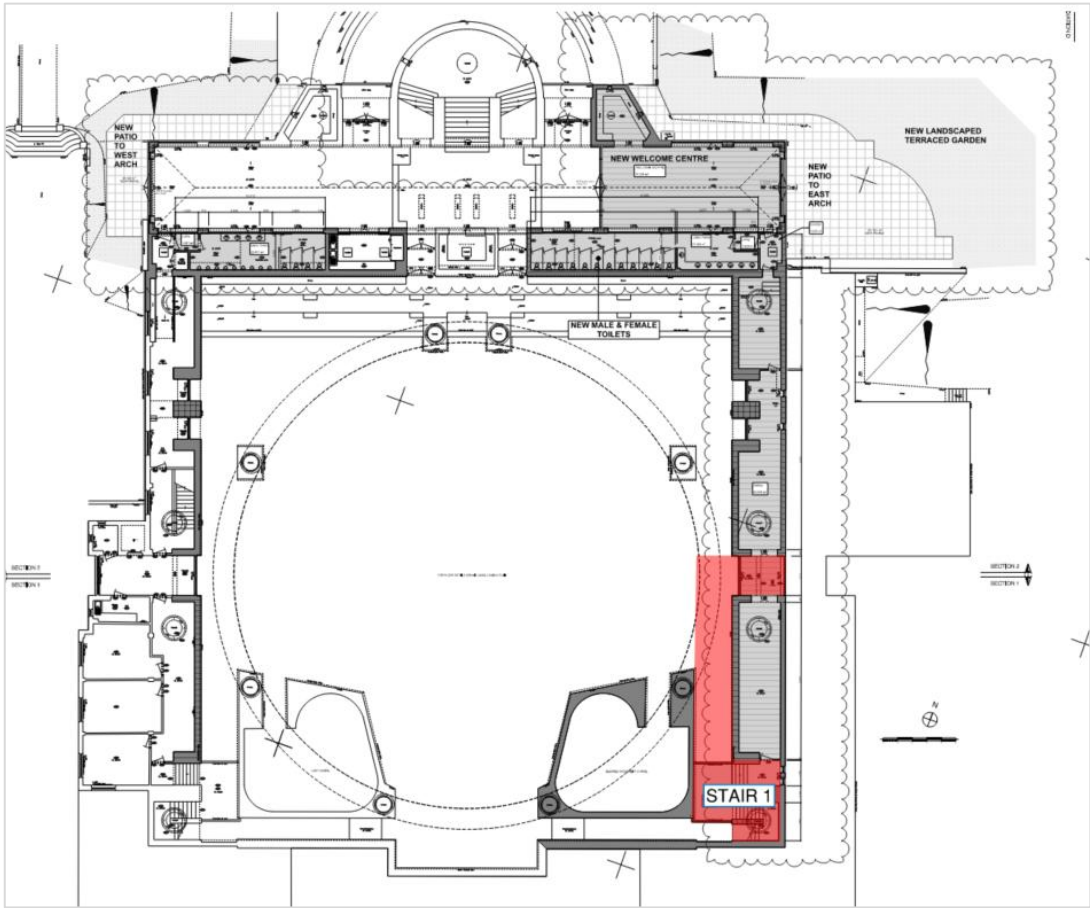


Figure 5 - Stair Exit from upper level

5.5 Merging Flow

The client has confirmed that at full capacity, the Worth Abbey Church could contain up to 1000 people during any service. The church is provided with four exits.

One of the exits provided at the ground floor level of the building shares the final escape route with the escape staircases from the upper floors, shown in Figure 5. The width of the final exit is required to meet the merging flow calculation below.

The calculation below has been conducted for the single escape stair exit, as per BS 9999:2017 guidance for merging flow, where the final exit serves the stairs going downwards, and the level escape route at the discharge level. The calculation used is as per below:

$$W_{FE} = NX + 0.75 \times S_{up}$$

Where: W_{FE} – width of the final exit in mm
 N – number of people served by ground floor storey exit

B – number of people served by the stair going upwards
 S_{up} – width of the stair serving upper floors in mm
X – minimum door width per person in mm/person
This equation can be rearranged to calculate the total merging flow escape capacity that will be provided by the final exit for Stair 1 and the church:

$$N = (W_{FE} - 0.75 \times S_{up}) / X$$

The total merging flow escape capacity can then be split evenly between exits into the associated stair at Church Level 00, where appropriate, to calculate the escape capacity per the associated exit.

The summary of the calculations is presented in Table 9.

Table 9 – Merging Flow Calculations for Ground Level

Exit	Final Exit Width [mm]	Stair Width [mm]	Minimum Door Width [mm/person]	Merging flow capacity provided at ground level
Church Exit	1200	1100	5.1	73

5.6 Occupants with Special Evacuation Requirements

Occupants who require special evacuation requirements, commonly known as occupants with disabilities, refer to occupants with permanent or temporary physical, sensory, or cognitive impairments that can impact a person's ability to evacuate a building unassisted in the event of fire. Occupants that require special evacuation requirements are not limited to those previously mentioned but may also include chronic health conditions and religious practices that may restrict behaviour in the event of fire.

Occupants at ground floor level will be able to evacuate directly to the outside via level escape routes via the building exits. Occupants of the library can evacuate via Stair 1, which should be provided with refuge points at the first floor level.

Refuges should be provided within all stairs at all levels. Each refuge should be designed as a minimum of 900 mm x 1400 mm in size and accessible to someone in a wheelchair. It should not reduce the width of the escape route or obstruct the flow of people escaping.

Refuges are provided with an emergency voice communication (EVC) system complying with BS 5839-9.

The building management should develop a Personal Emergency Evacuation Plan (PEEP) for staff members with special evacuation requirements as part of their fit-out design, and this should be regularly practised during the fire drills. A Generic Emergency Evacuation Plan (GEEP) should also be written for members of the public who require assistance during an emergency evacuation.

Individual PEEPs will be developed for special evacuation needs people who are regularly on the premises (such as staff and regular visitors) or for visitors to the premises who have made themselves known to staff.

The standard evacuation plan should include measures to make evacuation suitable for all persons on the premises. Information for occupants who require special evacuation requirements should be noted in fire action notices and the fire management plan.

5.7 Fire Doors and Escape Doors

All fire doors must comply with the guidelines outlined in Section 32.1 of BS 9999:2017.

All doors used for means of escape on floors are to measure a minimum clear width of 800 mm, and if the doors are required to facilitate independent evacuation of wheelchair occupants, these doors should be provided with a minimum clear opening of 850 mm.

Doors opening onto stairways or corridors would need to be sited so as not to encroach on the required effective width. Refer to Section 5.3 for minimum widths.

All doors located on escape routes will generally open towards the direction of exit unless they serve fewer than 60 persons. The doors must open at least 90° and not obstruct changes in level, except for a threshold or single step within the doorway.

All doors on escape routes would require either not to be provided with a securing device or be provided with a securing device that is easily openable from the inside without the use of a key and without more than one opening mechanism.

Any automatic door with a failsafe system installed on the escape route should fulfil the following requirements:

- Its failsafe system provides an outward opening from any open position
- Monitored failsafe system to open the doors if the mains electricity supply fails
- Doors to be in open position if the power fails

Any fire doors fitted with hold-open devices, including cross-corridor doors, would be required to release on:

- Operation of the fire alarm system
- Manual operation or operation of a hand-operated switch fitted in a suitable position
- Failure of the electricity supplies

All escape routes would maintain a minimum clear height of 2 m, and all exit doors would be openable without a key.

Vision panels would be provided in doors that open in both directions, while additional vision panels may be required as part of accessibility requirements. Where provided, uninsulated glazing on doors should be limited in size according to Table 27 of BS 9999:2017.

All fire door assemblies should comply with:

- BS EN 1634-2 for fire resistance; and, where applicable
- BS EN 1634-3 for smoke leakage

5.8 Emergency Lighting

Emergency lighting must be installed to provide temporary illumination in the event of failure of the primary power supplies to the regular lighting system. Adequate artificial lighting should be provided in all common escape routes. Escape stair lighting will be on a separate circuit from the electricity supply to any other part of the escape route.

Therefore, emergency lighting must be installed in accordance with the recommendations of BS 5266-1, BS EN 1838, and BS EN IEC 60598-2-22. The system must provide emergency lighting for 3 hours in case of a mains power failure.

The emergency lighting installation should illuminate all escape routes, all sanitary accommodation with a floor area over 8 m², windowless sanitary accommodation with a floor area not more than 8 m², electricity and generator rooms, switch room/battery room for the emergency lighting system and emergency control room, as well as all final exits from the buildings and firefighting equipment.

Primary and emergency lighting is required for any external escape routes that will not be lit by surrounding street lighting.

5.9 Fire Safety Signage

All signage would meet the recommendations of BS ISO 3864-1, BS 5499-4 and BS EN ISO 7010.

Escape signage would be required to be located as follows, except for escape routes which are in ordinary use:

- i) All designated escape routes or escape routes across open areas provided with signage, especially stairs and other changes in level and direction.
- ii) Signs will identify the position of all doors and other exits sited on escape routes, including storey exits and final exits.
- iii) Where an escape route from a room is not conspicuous, or confusion could occur, a sign will indicate the route, including intermediate signs where necessary.
- iv) All direction changes in stairways and open spaces that form part of an escape route will be marked with intermediate signs. Each intermediate door or junction will be similarly signed.

Additional fire safety signage should be provided where required as part of the fit-out works, or existing signage should be relocated according to the layout.

Fire-resisting doors in the common areas would be signed ‘Fire Door Keep Shut,’ and riser doors would be signed ‘Fire Door Keep Locked.’

Signage would be provided for firefighting equipment, including the ventilation controls and overrides in and around the building.

6 Active Fire Safety Systems

6.1 Automatic Water Fire Suppression

No automatic fire suppression system has been provided to the building. The building is less than 30 m in height and therefore no suppression systems are required.

6.2 Automatic Fire Detection and Alarm

The welcome centre should be provided with a minimum Category M alarm system in line with BS 5839-1:2017. It is proposed to increase this to a Category L2 automatic fire detection and alarm system in line with BS 5839-1:2017 to provide earlier warning to all occupants.

The library should be provided with a Category L2 automatic fire detection and alarm system in line with BS 5839-1:2017.

7 Internal Fire Spread

7.1 Internal Linings

In the early stages of a fire in a building, the choice of material for the lining of walls and ceilings can significantly affect the spread of fire and its growth rate. It is particularly important that in circulation spaces, where the rapid spread of fire is most likely to prevent occupants from escaping, the surface linings are restricted by making provision for them to have low rates of heat release and surface spread of flame.

All wall and ceiling linings within the building should meet the recommendations outlined in BS 9999:2017 guidance, as summarised in Table 10 when tested under the European Classifications (in accordance with BS EN 13501-1:2018).

Table 10 - Classification of Linings

Location	European Class
Small Room of Area Not Exceeding 30 m²	D-s3, d2
Other Rooms	C-s3, d2
Circulation Spaces	B-s3, d2

Parts of the wall area in rooms may be of poorer performance than specified within Table 10 above, but not less/worse than Class D-s3, d2. In any one room, the total area of lower performance wall lining should be less than an area equivalent to half of the room’s floor area, up to a maximum of 60 m².

Internal escape routes should generally have wall and ceiling linings achieving a B-s3, d2 surface spread of flame standard, apart from permitted exceptions, which may be noted elsewhere in this report.

These should be maintained for the lifecycle of the building, and manufacturer’s guidelines should be followed with respect to maintenance and replacement of their products.

Display features or items, such as posters, artwork pieces, etc, may be included with appropriate consideration through risk assessment, justification, and ongoing control.

Where thermoplastic materials are used (e.g., windows, roof lights and lighting diffusers only), these would comply with the recommendations given in Sections 34.1.2 and 34.1.3 of BS 9999:2017.

7.2 Structural Fire Resistance

Fire resistance requirements will satisfy the relevant European Standard (BS EN 13501-1 to 4). Fire resistance is measured in minutes. This relates to the time elapsed in a standard test and should not be confused with real survival time.

The building structure should achieve a minimum of 60 minutes fire resistance. Therefore, when tested in accordance with relevant European Standards (BS EN 1364, 1365, or 1366), the elements of the structure should achieve 60 minutes of fire resistance for loadbearing capacity (R).

7.3 Compartmentation and Fire-Resisting Construction

There is no maximum compartment size for a risk profile of B2 with floors less than 18 m in height.

The maximum compartment size for a risk profile of B3 with floors less than 30 m is 2000 m². The library has a floor area of less than 2000 m².

The library floor and walls must be enclosed in a minimum of 60 minutes fire resistance to ensure the occupancies of the church and library are separated in accordance with 31.3.1.5 of BS 9999: 2017.

Any penetrations through the fire-resisting construction should be fire-stopped to achieve the same fire resistance as the construction they penetrate.

The minimum requirements for the provision of compartmentation and fire-resisting construction, as well as associated fire doors, are shown in Table 11.

Table 11 - Compartmentation and Fire Resisting Construction

Area	Fire Resistance Requirements	Exposure	Fire Doors
Slab Separating Church and Library	REI 60	From underside	-
Wall Separating Church and Library	REI 60	From each side	E30Sa
Window Separating Church and Library	E 60	From each side	-
Storage Areas	REI 30	From each side	E 30
Period of resistance for Loadbearing (R), Integrity (E), Insulation(I).			
Fire door sets to consist of a complete door set as defined by BS 8214: 2016. This includes door leaves, frames, cold smoke seals and closers where applicable. Fire doors should meet the Sa classification when tested to BS EN 1643-3 or have a leakage rate not exceeding 3 m³/m/hour (from head and jambs only) when tested at 25 Pa under BS 476-31.1.			
Only areas within the scope of works have been included in this table. Areas such as plant rooms are not considered.			

7.4 Fire-Stopping and Penetrations through Fire-Resisting Construction

Fire-stopping should be provided at the junction of fire-separating walls and external walls in order to maintain the fire resistance period of fire-separating walls and thereby prevent a fire from travelling around the junction and into the neighbouring compartment.

Penetrations through lines of fire-resisting separation should be fire-stopped to achieve the same fire resistance as the separating elements.

All pipes, ductwork and services passing through fire-resisting separations should either be enclosed in fire-resisting construction (i.e. shafts) of matching fire resistance or provided with fire dampers of matching fire resistance. Certain small diameter pipes require only fire-stopping around the pipe, dependent on the pipe material and the type of fire-resisting barrier penetrated. Further information is available in Table 31 of BS 9999:2017. Figure 6 below is provided to assist in the interpretation of this.

Additional guidance is provided within the Association for Specialist Fire Protection (ASFP) Red Book - Fire Stopping, which gives details on the provision of proprietary materials and systems used to provide fire-stopping and sealing of penetrations within fire-separating elements to comply with building regulations.

All fire-stopping installations are to be undertaken by an appropriate third-party accredited, approved installer.

Pipes that pass through a fire-separating element are to meet one of the following provisions.

7.4.1 Proprietary Seals

Provided a proprietary sealing system which has been shown by test to maintain the fire resistance of the wall, floor, or cavity barrier.

7.4.2 Restricted Diameter Pipe

Where a proprietary sealing system is not used, fire-stopping may be used around the pipe, keeping the opening as small as possible.

7.4.3 Sleeving

A pipe of lead, aluminium, aluminium alloy, fibre-cement or UPVC, with a maximum nominal internal diameter of 110 mm, may be used with a sleeving of non-combustible pipe.

The opening in the structure should be as small as possible and provide fire-stopping between the pipe and the structure. The sleeve must extend no less than 1000 mm on either side of the structure.

It is recommended that fire-stopping within the existing building be surveyed and reviewed in accordance with the above recommendations and rectified where required during the works.

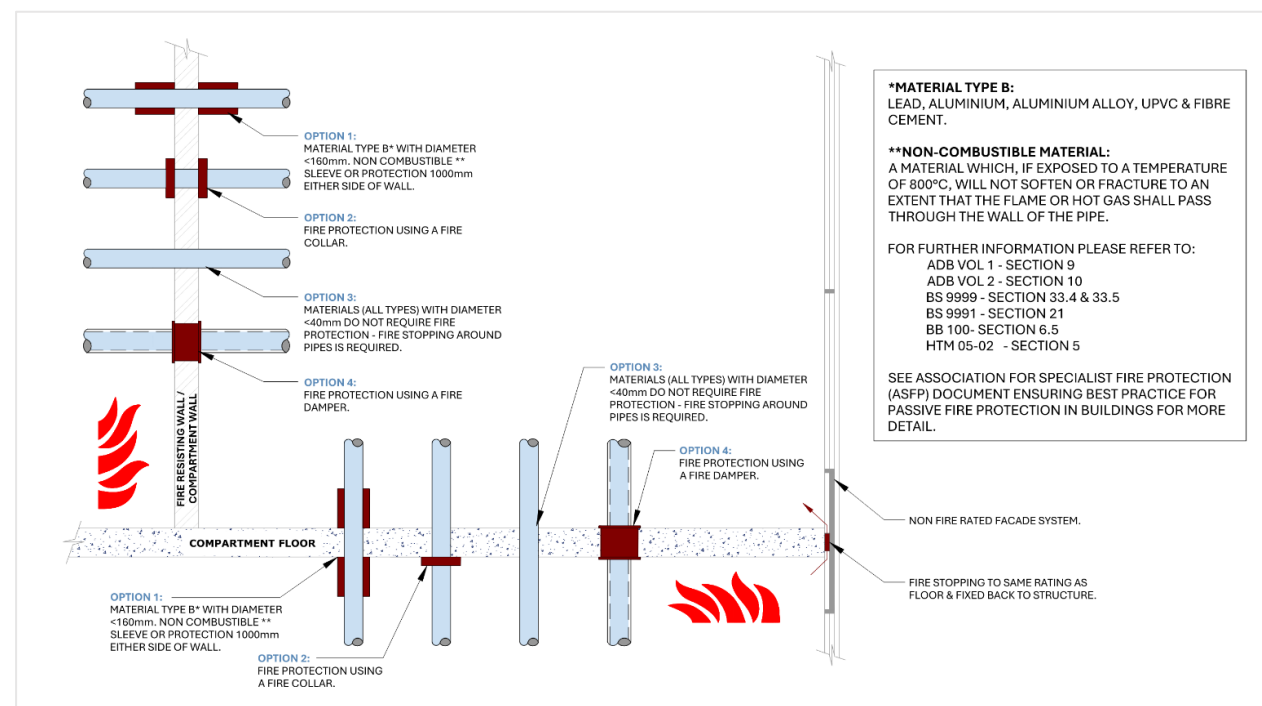


Figure 6 – Fire-stopping expectations

7.5 Protection of Ventilation Ducts and Flues

BS 9999:2017 guidance recommends that one of the following four methodologies should be implemented where a ventilation duct passes through a fire-resisting element to maintain the integrity of the element being breached:

- Protection using automatic fire and smoke dampers.
- Protection using thermally activated fire dampers. It should be noted that fire dampers alone are not suitable to protect escape routes, with actuated fire and smoke dampers required in these locations.
- Protection using fire-resisting enclosure achieving the fire resistance rating equivalent to the highest rated compartmentation it penetrates.
- Protect using fire-resisting ductwork.

It should be noted that options i) and ii) are not suitable for ductwork serving kitchen extracts and areas where flammable vapours are present.

If automatic fire and smoke dampers are the chosen methodology, they should be tested to BS EN 1366-2:2015 and be classified to BS EN 13501-3:2005. They should have an integrity and smoke leakage (ES) classification equal to or greater than the element being penetrated and at least ES 60.

Where fusible link fire dampers are utilised in a design, they should conform to BS EN 15650:2010 and be classified to BS EN 13501-3:2005. They should have a minimum integrity (E) classification of 60-minutes or match the integrity rating of the fire-resisting elements being penetrated, whichever is higher.

All dampers used in design should be listed within the Association for Specialist Fire Protection's (ASFP) Grey Book - EN Fire Dampers, and the recommendations contained within used to appropriately specify and install such units.

Where fire-resisting ductwork is provided, it should be confirmed that either the ductwork itself or the encasement system is appropriately fire-resistant to BS EN 1366-1:2014+A1:2020. Further details are also provided in the ASFP's Blue Book - EU Fire Resisting Ductwork.

Any air transfer grilles required as part of the ventilation system should not be provided within any wall, door, floor, or ceiling enclosing a protected stairway or protected lobby.

Air transfer grilles located in any fire hazard rooms should be provided with both fire and smoke containment.

Any transfer grilles fitted in fire doors would need to be accompanied by a test certificate provided by the door manufacturer.

If a flue, or duct containing flues or appliance ventilation duct(s), passes through a compartment wall or compartment floor or is built into a compartment wall, each wall of the flue or duct should have a fire resistance of at least half that of the wall or floor, in order to prevent by-passing of the compartmentation. See Figure 33 of BS 9999:2017, presented in Figure 7.

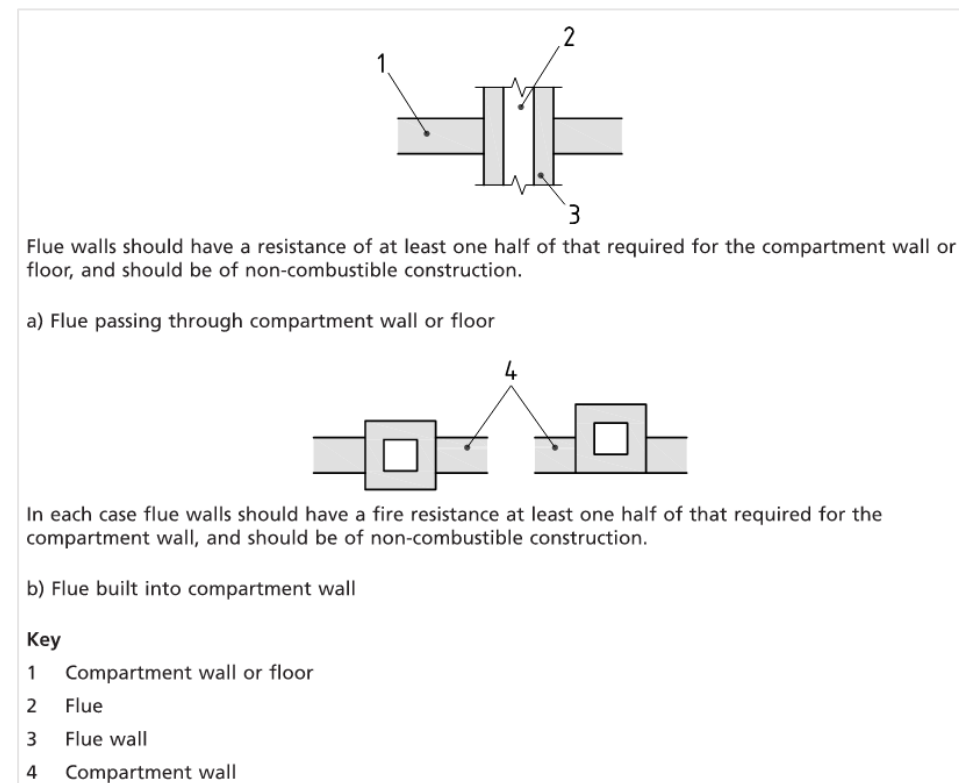


Figure 7 - Figure 33 of BS 9999:2017

7.6 Concealed Spaces

Cavity barriers should be provided to prevent the rapid spread of unseen fire or smoke in voids and to prevent the spread of fire around compartmentation via voids and concealed spaces.

Concealed cavities (e.g., voids in partition walls, roof voids, voids between suspended ceilings and the soffit of the floor above) should be provided with cavity barriers to sub-divide them as outlined within Figure 36 of BS 9999:2017.

In general, cavity barriers should be at 20 m centres within cavities, and formed exclusively of Class C-s3, d2 materials or better. For other materials, the spacing between cavity barriers should be reduced to 10 m.

In voids above or below large rooms, cavity barriers may be at up to 40 m centres in either direction, provided there are also cavity barriers provided along the lines of the enclosing walls/partitions of that room and cavity linings are exclusively Class C-s3, d2 or better.

Cavity barriers should achieve 30 minutes integrity fire resistance (E) and 15 minutes insulation (I) fire resistance.

Cavity barriers should be within the external wall cavity, positioned to align with the internal fire-resisting walls and floors, unless constructed in line with Figure 36 of BS 9999:2017, presented in Figure 8 for ease of reference. Cavity barriers should also be installed to seal around any openings (windows or doors) in the external wall.

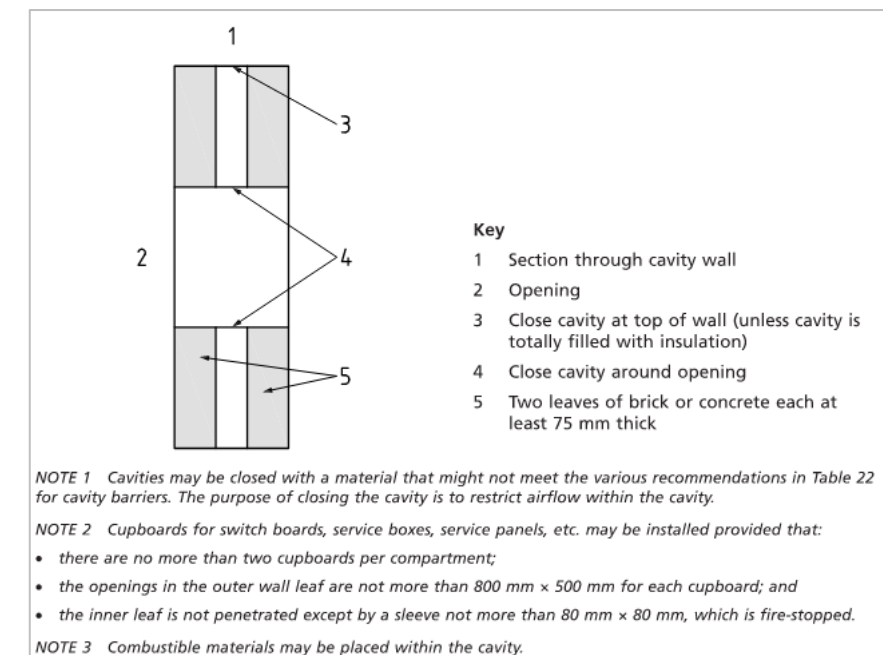


Figure 8 - Figure 36 of BS 9999:2017

8 External Fire Spread

8.1 Building Separation

The building's external walls must be designed such that they will not support fire spread from the external surfaces facing another building. Should a fire occur in a building, heat will radiate through non-fire-resisting openings in the external walls.

In order to reduce the chance of this occurring, the Building Regulations place limits on the area of the external elevation with no fire resistance. This area is known as the unprotected area. The distance of the building from other buildings, the use of the building, and the compartment size are all factors in determining the acceptable degree of unprotected area for each elevation.

The external façade of the building will remain largely untouched during this refurbishment, other than the replacement of a building entrance door; therefore, the external fire spread will remain untouched and no worse than the existing condition.

8.2 External Wall Construction

The external walls of the building should be designed to reduce the risk of fire spread and the risk of fire spread from one building to another.

The building has a height of less than 18 m with a relevant boundary of more than 1 m away, therefore, no restrictions are placed on the materials used.

It is noted that Regulation 7 (1A) also prohibits the use of relevant compost panels in external walls, and these should not be used in the external wall construction.

Relevant metal composite materials are defined as any panel or sheet having a thickness of no more than 10 mm, which is composed of a number of layers, two or more of which are made of metal, alloy or metal compound and one or more of which is a substantial layer made of a material having a gross calorific value of more than 35 MJ/kg when tested in accordance with BS EN ISO 1716. A substantial layer is defined as a layer which is at least 1 mm thick or has a mass per unit area of at least 1 kg/m².

8.3 Roof Coverings

All roof coverings may be designated in accordance with Table 12, when tested in accordance with BS EN 135015. This is not part of the scope of this report.

Table 12 - Roof Covering Requirements

Designation of Covering of Roof or Part of Roof	Distance From Any Point of 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	Not Acceptable	Not Acceptable	Acceptable
E _{ROOF} (t4)	Not Acceptable	Not Acceptable	Not Acceptable	Not Acceptable
F _{ROOF} (t4)	Not Acceptable	Not Acceptable	Not Acceptable	Not Acceptable

9 Access and Facilities for Fire and Rescue Service

9.1 Vehicle Access to and Around the Building

In accordance with Table 17 of BS 9999:2017, the stair of a building with an A or B risk profile, which is less than 11 m, should be provided with unvented lobby protection and a dry rising fire main.

No dry rising main has been provided to the building, and it is considered reasonable since it is not part of the scope of the project to provide a dry rising main.

In accordance with Table 19 of BS 9999:2017, perimeter access has been provided to more than 15% of the building perimeter. The building has a perimeter of 207 m, therefore requiring access to 31.05 m of the perimeter. From the hardstanding location, access has been provided to 52 m of the perimeter with access to three doors which all have a width of more than 750 mm.

10 Life-Safety Secondary Power Supplies

All life safety systems will be provided with secondary power supplies in accordance with BS 8519:2020. These systems include, but are not limited to:

- Emergency lighting
- Automatic fire alarm and detection systems
- All fire alarm interlinked fire/smoke dampers
- Automatic smoke control systems (including automatic opening vents, mechanically activated smoke control dampers and smoke ventilation systems)
- Emergency Voice Communication systems
- Security doors requiring power

The selection, design and installation of these power supply systems should be in accordance with BS 8519:2020 and BS EN 12010-10:2005, where relevant, with additional protection measures as described in Clause 37.2.3 of BS 9999:2017, e.g., fire rated cabling.

There must be minimal delay in changeover if the main power fails, and it must occur automatically.

The emergency lighting/internally illuminated signage and fire alarm system will utilise internal batteries to provide back-up power. These batteries will be capable of a continuous stand-by supply in accordance with the relevant design standard and be fully rechargeable within a period of 24 hours.

All plant that supports fire life safety equipment should be enclosed within a minimum of REI 120 fire-resisting construction.

11 Fire Safety Management

11.1 Regulatory Reform (Fire Safety) Order 2005

Management procedures have a pivotal role in fire prevention, control and evacuation of occupants should a fire incident occur. Within non-domestic premises, the Regulatory Reform (Fire Safety) Order 2005 (RRFSO) places legal obligations on the building's management to do this.

The 'responsible person' has a duty to make the premises safe and must undertake regular fire risk assessments. Under the new legislation, the responsible person will be held accountable for any breaches in fire safety.

The owner or person in control of the premises is described as the *responsible person*.

11.2 Management and Responsibilities in Support of the Fire Strategy

To be able to demonstrate in broad terms that all structures, systems and components should be designed, constructed, commissioned, operated and maintained in such a way as to enable duty holders of the building to manage the risk and provision of fire service access and water supply, a Fire Statement document sets out to achieve the following principles:

- 1) Demonstrate that the building conforms to relevant building regulations and planning legislation and applies proportionate good engineering practices and sound risk management principles.
- 2) Identify the failure modes and potential hazards with respect to fire service access and water supply.
- 3) Provide sufficient information (golden thread) that demonstrates that any measures have been applied appropriately and at the first Gateway.

Inherent in fire strategy is the assumption that the premises will be appropriately managed for fire safety when in use. In accordance with BS 9999:2017, there are two management system levels: enhanced and adequate. Enhanced demonstrates a high level of assurance with a BS 9997 standard of management level. Adequate levels of management demonstrate assurance that conforms to the requirements of the legislation.

Fire safety management must be integrated with all other management systems. To ensure there is no doubt as to where the responsibility for fire safety rests and to enable consistency of approach, each establishment must appoint a designated fire safety representative who reports to the nominated Building Safety Manager.

The appointed person should have the necessary authority and powers of sanction to ensure that standards of fire safety are maintained. The main duties of the Fire Safety Manager are as listed in BS 9999:2017, include:

- 1) Managing the building to minimise the incidence of fire (fire prevention), e.g., good fire safe housekeeping and security.
- 2) Producing an Emergency Fire Plan.
- 3) Being aware of all the fire safety features provided and their purpose.
- 4) Being aware of any particular fire risks on the premises, plus those relating to construction materials.
- 5) Being aware of their responsibilities towards occupants who may require assistance during any evacuation.
- 6) Liaise with and, where necessary, seek the advice of the fire authority, the licensing authority and other relevant enforcing authorities.
- 7) Having powers to deal with individuals who damage or tamper with fire safety systems, who ignore any smoking policy or who block exits.
- 8) Liaising with other fire safety managers in a multi-occupancy arrangement.
- 9) Ensuring that public areas are suitably controlled.
- 10) Ensuring that tenants, concessionaires or caretakers are appropriately briefed as to the fire procedures for the building.
- 11) Ensuring that all necessary and appropriate communication systems are in place to deal with any fire incident.
- 12) Checking the adequacy of any firefighting equipment and ensuring its regular maintenance.

- 13) Ensuring fire escape routes and fire exit doors/passageways are kept unobstructed, and doors operate correctly.
- 14) Ensuring that fire detection and protection systems are maintained and tested, and proper records are kept; and
- 15) Ensuring any close-down procedures are followed.

Good fire-safe housekeeping will be encouraged to ensure that the effectiveness of the fire safety provisions is not adversely affected. This should include adequate provision for the disposal of waste and/or rubbish.

Where appropriate, these facilities should be emptied daily, and the rubbish should be stored in a suitable area outside the building. Maintenance procedures should be developed to ensure that all equipment and services can operate effectively. Maintenance staff should be trained in the importance of the fire safety systems and planned maintenance programmes developed.

The management of ancillary accommodation will need to develop procedures to assist with the evacuation of vulnerable persons and should not rely on the fire and rescue service for assistance.

Suitable assembly points outside the building should be identified. These should be remote from the access routes used by the attending Fire Services.

Maintenance procedures will be developed to ensure that all equipment and services can operate effectively. Maintenance staff will be trained in the importance of the fire safety systems and planned maintenance programmes developed.

Where installed, fire extinguisher points should be located at storey exits to ensure that coverage of at least one fire point containing a water type and carbon dioxide type fire extinguisher for every 200 m² of floor area exists. The type and size of fire extinguisher(s) at each fire point should be selected in accordance with BS 5306 guidance.

12 Information Schedule

Table 13 - Information Used

Information ID	Title	Rev
WH01-WDI-XX-B2-DR-A-002300	Level B2 General Arrangement Plan	P01
WH01-WDI-XX-B1-DR-A-002300	Level B1 General Arrangement Plan	P01
WH01-WDI-XX-LG-DR-A-002300	Level LG General Arrangement Plan	P01
WH01-WDI-XX-00-DR-A-002300	Level 00 General Arrangement Plan	P01
WH01-WDI-XX-01-DR-A-002300	Level 01 General Arrangement Plan	P01
WH01-WDI-XX-02-DR-A-002300	Level 02 General Arrangement Plan	P01
WH01-WDI-XX-03-DR-A-002300	Level 03 General Arrangement Plan	P01