



Developed for:  
Pagecolt Ltd.

# Outline Fire Safety Strategy

## 235-237 The Broadway

Bexleyheath,  
London, DA6 7EL

Issue 02  
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# Outline Fire Safety Strategy

235-237 The Broadway

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## 1. INTRODUCTION

### 1.1 General

- 1.1.1 Ashton Fire have been commissioned by Pagecolt Ltd to provide fire safety consultancy services for the proposed development at 235 & 237, The Broadway. The project encompasses the proposed demolition of the existing buildings and redevelopment to provide commercial use (Use Class E) at ground floor with residential flats (Use Class C3) above over four floors, together with associated cycle and refuse storage and service area. The development is located in Bexleyheath, London DA6 7EL, London.
- 1.1.2 This document is confidential and for the exclusive benefit of Pagecolt Ltd (the Client). It may not be assigned to or relied upon by a third party without agreement of Ashton Fire Ltd (Ashton Fire) in writing. Ashton Fire retains all copyright and other intellectual property in the document and its contents unless transferred by written agreement between Ashton Fire and the Client.
- 1.1.3 This report outlines the minimum fire safety provisions required for the proposed building to be compliant with the Functional Requirements of the Building Regulations 2010 (as amended).
- 1.1.4 This document is intended for RIBA Stage 3. This document is an outline document only and is not to be submitted as part of the Building Regulation application; a Detailed Fire Safety Strategy is required to be developed during the proceeding design stages to support.
- 1.1.5 It should be noted that any alternative design solutions proposed within this report are subject to agreement and eventual approval by the relevant authorities having jurisdiction (AHJs).
- 1.1.6 Unless specifically covered in this report please refer to the adopted design guidance for further details.

### 1.2 Legislation and basis of design

- 1.2.1 Fire safety in buildings is primarily governed by two pieces of legislation in the UK. The Building Regulations 2010, Part B, Fire Safety applies to building design, whilst for fire safety management in buildings, compliance with the Regulatory Reform (Fire Safety) Order 2005 (FSO) is required.
- 1.2.2 This strategy has been developed to meet the level of fire safety expected under the Building Regulations 2010 (as amended), namely:
- B1 - Means of warning and escape
  - B2 - Internal fire spread (linings)
  - B3 - Internal fire spread (structure)
  - B4 - External fire spread
  - B5 - Access and facilities for the fire and rescue service
- 1.2.3 The fire safety strategy will be developed to satisfy the requirements for fire safety as set out by the Building Regulations. The strategy has not been specifically developed to address property protection or insurer's requirements. However, the features that are included for life safety, as required by the Building Regulations 2010, will contribute in some extent to business and property protection.
- 1.2.4 In general, the necessary level of life safety will be achieved utilising BS 9991:2015 [1][2] for the residential areas, BS 9999: 2017 [3] for the non-residential areas. Fire engineering principles are employed to support alternative solutions where strict adherence to the codes would conflict with the

wider aspirations for the scheme. Unless otherwise stated, it is expected that provisions will be provided according to recommendations of BS 9991 or BS 9999 as appropriate.

- 1.2.5 Fire engineering principles may be employed to support alternative solutions where strict adherence to the guidance would conflict with the wider aspirations for the scheme. Unless otherwise stated, it is expected that all aspects of the design will be in accordance with Approved Document B, applicable British Standards and codes of practice.
- 1.2.6 On the basis that recommendations made within the guidance documents are followed, it is considered that the life safety requirements of the Building Regulations 2010 (as amended) will be satisfied, and that an adequate level of safety will be achieved throughout the premises.
- 1.2.7 The strategy has been developed in cognisance of the Construction (Design and Management) Regulations 2015 (CDM 2015) [4], which sets out what designers are required to consider to protect anyone involved in the construction or ongoing use of a project.
- 1.2.8 Where departures from the guidance documents are identified, alternative proposals (including associated analyses) are documented for facilitating review with the AHJs. In accordance with the fire safety engineering principles detailed in the PD 7974 codes of practice, it is considered appropriate that all fire precautions are determined based on there being one seat of fire (i.e., accidental fires).
- 1.2.9 This strategy does not provide a comprehensive assessment of site fire safety during the building works or the phasing of these works. The Fire Protection Association and the Health and Safety Executive (HSE) issue guidance on identifying and managing fire precautions during the works, which should be consulted by the contractor or their specialist advisor when developing their construction fire safety plan.
- 1.2.10 Unless specifically covered in this report, please refer to the adopted design guidance for further details.

### 1.3 The London Plan – Policy D12

- 1.3.1 The Policy D12 states:

*In the interest of fire safety and to ensure the safety of all building users, all developments 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;
  - 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.

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 position of equipment, firefighting lifts, stair and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these;
- How provision will be made with the curtilage of the site to enable fire appliances to gain access to the building;
- Ensuring that any potential future modification to the building will take into account and not compromise the base build fire safety/ protection measures.

1.3.2 In accordance with Policy D5 (Inclusive Design) of the London Plan, safe and dignified emergency evacuation is required to be incorporated into the building for all building users. As this building will have a lift installed, the aforementioned policy stipulates that the lift should be suitably sized for evacuation.

1.3.3 Evacuation lifts and associated provisions will be appropriately designed and constructed and should include the necessary controls suitable for the intended purposes. Furthermore, the operation of the lifts will be supported by appropriate management procedures. The end client will need to understand and provide a suitable management plan for the evacuation lifts within the building.

1.3.4 This document has been prepared in line with the above items and is deemed suitable to be adopted as the Fire Statement that is referenced in Policy D12. However, as this document is intended to serve as strategic guidance, detailed design information such as the methods of construction or the selection of specific products will not be included within this document and can be obtained from other members of the design team.

1.3.5 In accordance with Clause 3.12.9 of Policy D12 of the London Fire Plan, Fire Statements are to be produced by qualified engineers with relevant experience in fire safety such as a chartered engineer or suitably qualified and competent professionals with demonstrable experience to address the complexity of the design being proposed. The relevant experience of the authors and authorisers of this document are displayed in Table 1.

Table 1 - Qualifications and relevant experience

Name	Role	Academic qualifications	Membership of professional bodies	Relevant experience
Claire Doherty	Fire Engineer	BEng (Hons) in Fire Safety Engineering	Associate Member with the Institute of Fire Engineers (AIFireE) Member of Engineers Ireland (MIEI)	1 year in the design of fire strategies for residential buildings including high-rise buildings.
Daniel Mois	Associate Fire Engineer	BSc in Civil Engineering MSc in Civil Engineer, Building Structures	Associate Member with the Institute of Fire Engineers (AIFireE)	5 years in the design of fire strategies for residential buildings including high-rise buildings.
Ceranda Argue	Associate Fire Engineer	BSc Architectural Technology. BSc (Hons) Fire Safety Engineering	Member of Engineers Ireland (MIEI)	8 years in the design of fire strategies for residential buildings including high-rise buildings.

#### 1.4 Reference information

1.4.1 This strategy is based on information by MAB Architects provided to Ashton Fire as listed in Table 2. Additional contradictory information or subsequent design variations to the information supplied may render the findings and recommendations of this report invalid.

1.4.2 The figures used within this report are indicative and whilst intended to convey the principles of the fire safety strategy, they may not be representative of the final arrangement. The fire safety principles contained within this report are required to be maintained through any design amendments during the lifetime of the building.

Table 2 - Project documentation referenced.

Description	Drawing No.	Rev.
Topographical Survey Block Plan	2473_01	---
Existing & Proposed Ground Floor Plans	A100	C
Existing & Proposed 1st Floor Plans	A200	C
Existing & Proposed 2nd/3rd Floor Plans	A300	C
Existing & Proposed 3rd Floor Plans	A400	E
Existing & Proposed Roof Plans	A500	A

## 1.5 Project description

- 1.5.1 235-237 The Broadway is the proposed demolition of the existing buildings and redevelopment to provide commercial use (Use Class E) at ground floor with residential flats (Use Class C3) above over four floors, together with associated cycle and refuse storage and service area. The development is located at the junction between Albion Road and Broadway in Bexleyheath, London. The building will measure 12.8m above Ground Level.
- 1.5.2 Due to the height of the building exceeding 11m, it should be provided with a sprinkler system. The residential areas should be provided with a sprinkler system in accordance with BS 9251 [5], the commercial areas should be provided with a sprinkler system in accordance with BS EN 12845 [6].
- 1.5.3 Ground Level of the building comprises of commercial and ancillary areas, i.e., refuse and cycle stores, as well as the residential entrance. At this stage, the shell and core only are being developed for the commercial spaces, and therefore it is the responsibility of the tenants to provide a separate fire strategy for the unit prior to any fit-out works commencing.
- 1.5.4 Access to the upper levels (First Floor-Fourth Floor) is facilitated by a protected stair. At Ground Floor Level, the stair discharges via a dedicated protected passageway to outside onto Albion Road.
- 1.5.5 Access to the flats is provided via a balcony open to air. However, following a review of the proposal It should be noted that the balcony does not align with the recommendations of BS 9991.
- 1.5.6 The development is located in London and is applicable to the recommendations of the London Plan, to align with D5 of the London Plan, an evacuation lift should be provided.
- 1.5.7 A lift will be provided which is currently serving the First Floor Level only. Where a lift is provided it should be designed as an evacuation lift serving all levels of the building, currently guidance is in relation to provision and operation of evacuation lifts is unclear. Proceeding with the lift serving the first floor only should be considered as an approvals risk that should be discussed and agreed with relevant stakeholder.
- 1.5.8 All flats on the First, Second and Third Floor level will have an open plan arrangement, i.e., kitchen, dining and living room spaces.
- 1.5.9 All flats on the Fourth Floor Level will be provided with an entrance hall, which should be a fire protected entrance hall enclosed in construction achieving a fire resistance rating of 30 minutes.
- 1.5.10 The roof level will be accessible for maintenance staff only via an access hatch on the Fourth Floor Level.

- 1.5.11 An indicative site plan is illustrated in Figure 1. Indictive upper floor plans are illustrated in Figure 2 to Figure 7.

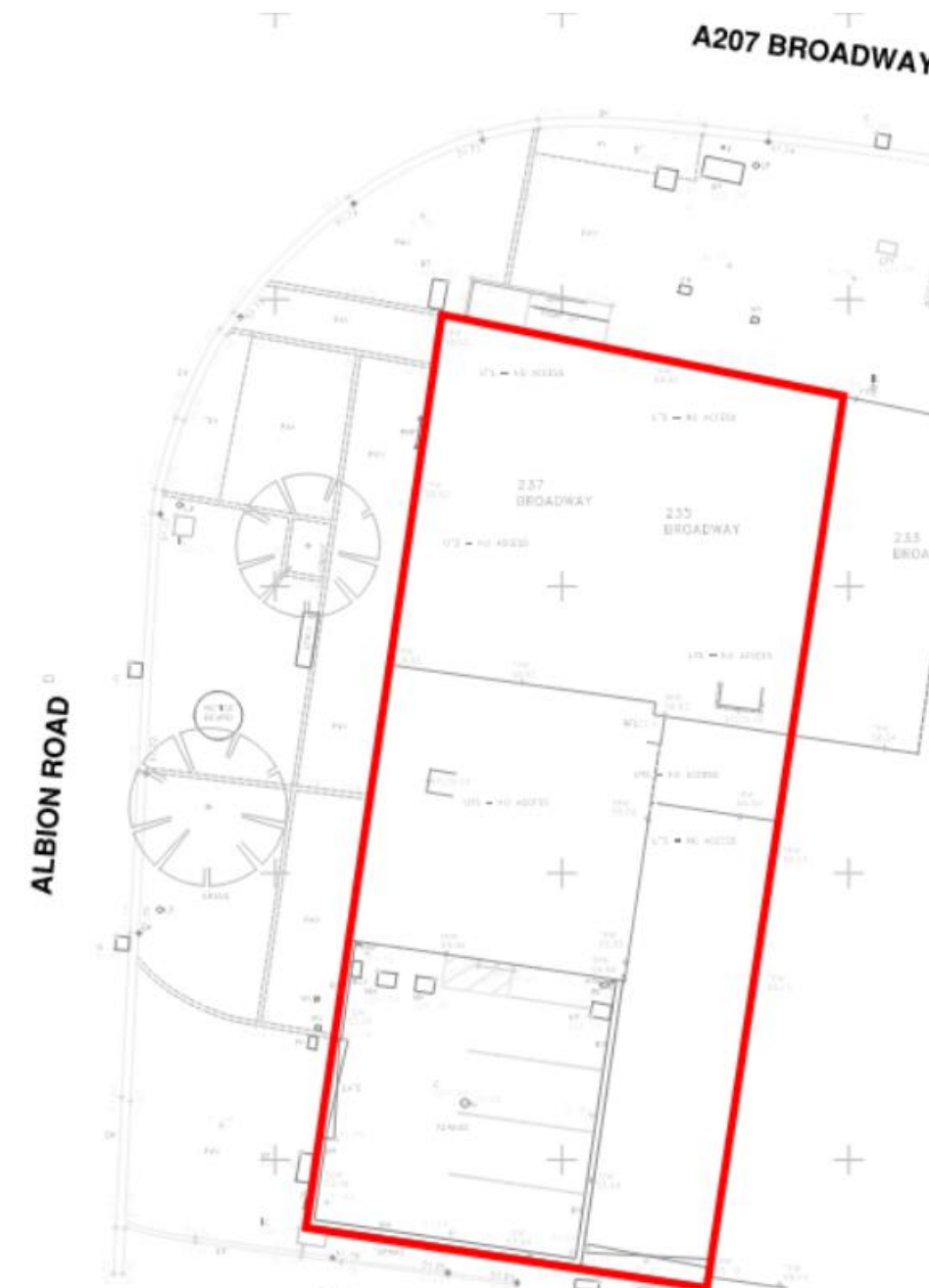


Figure 1 - Indicative site plan

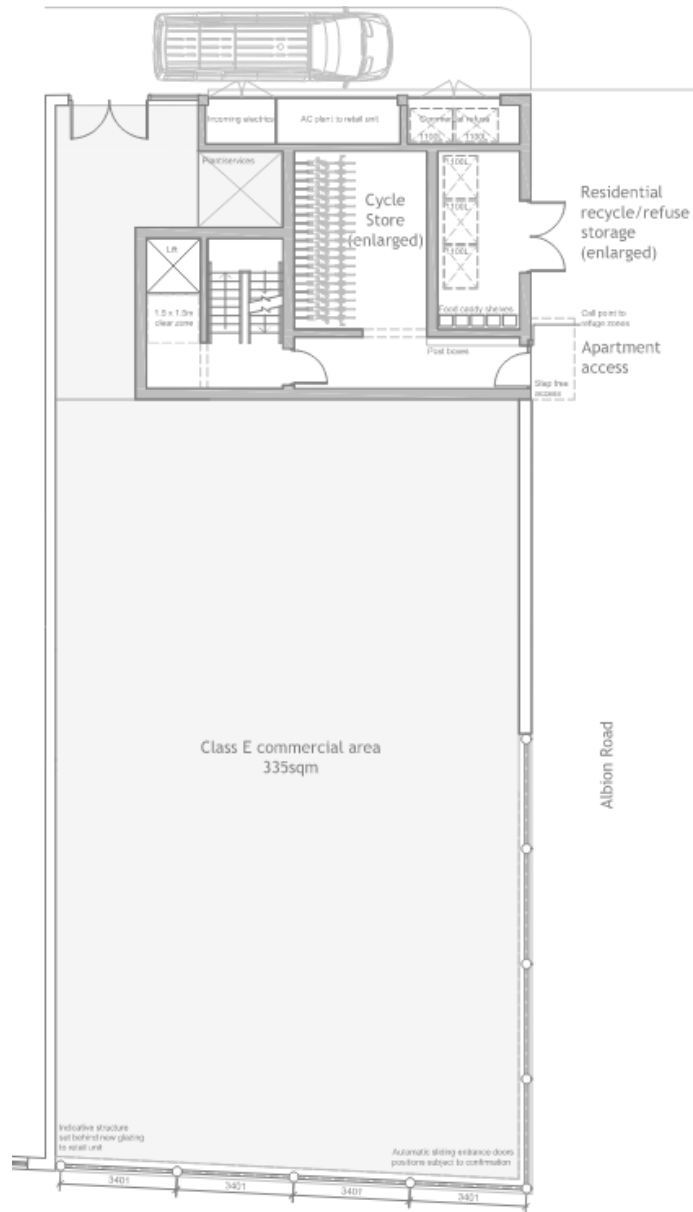


Figure 2 - Indicative Ground Floor Level

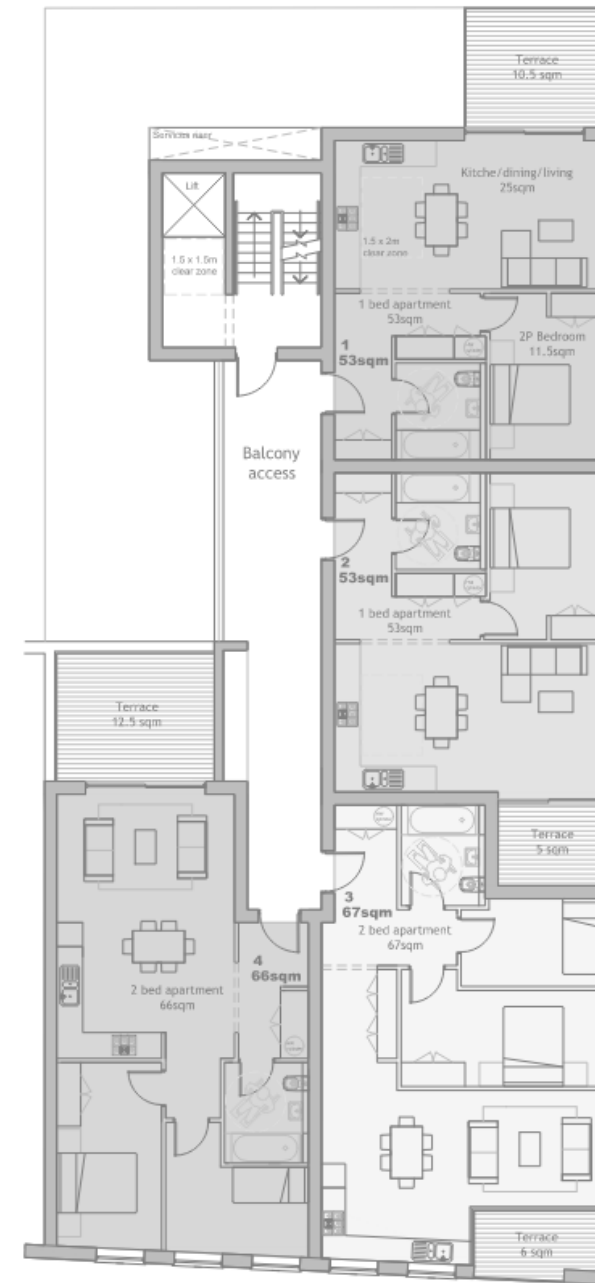


Figure 3 - Indicative First Floor Level



Figure 4 - Indicative Second Floor Level

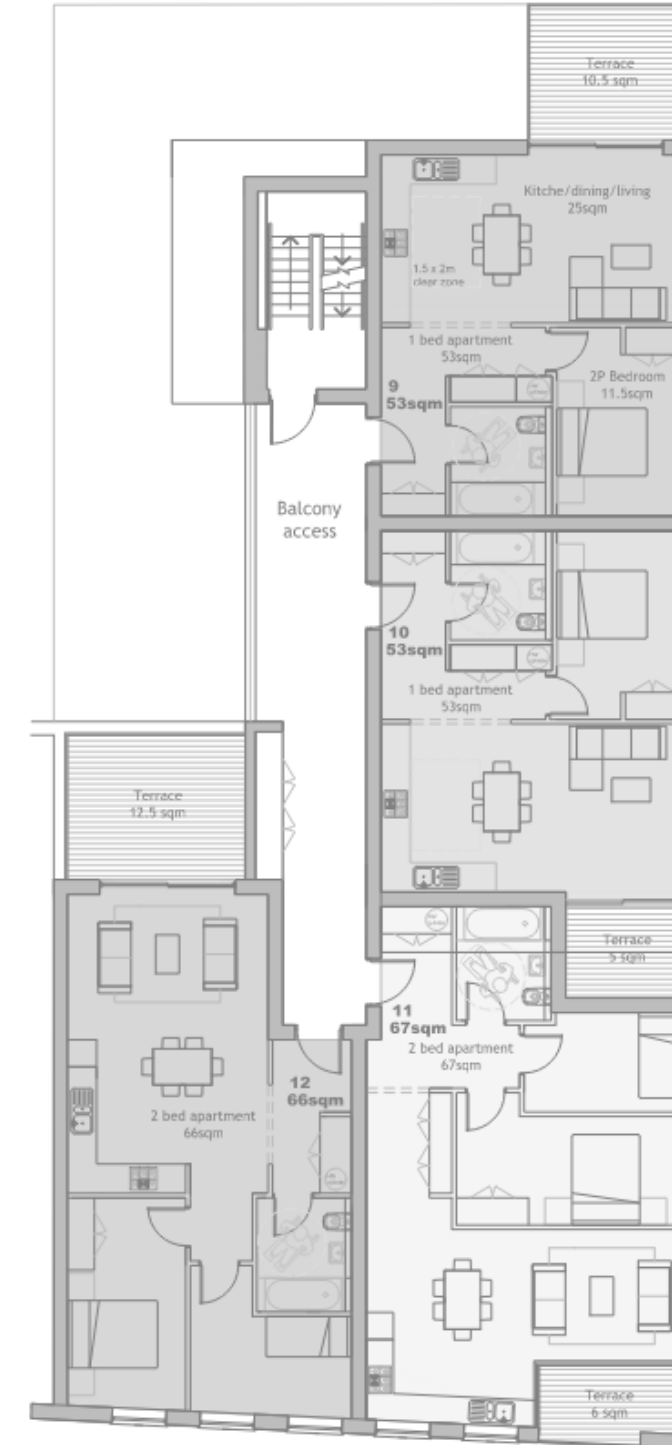


Figure 5 - Indicative Third Floor Level - Flats



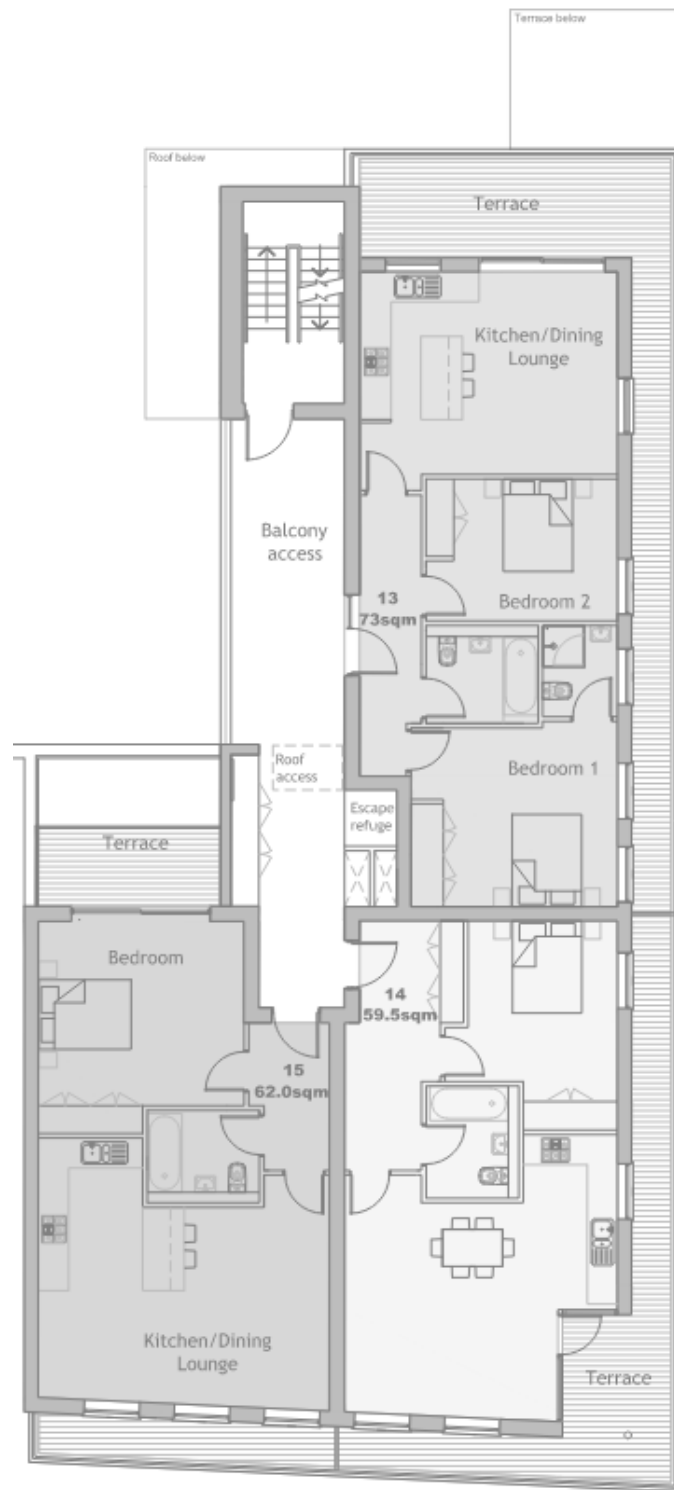


Figure 6 - Indicative Fourth Floor Level

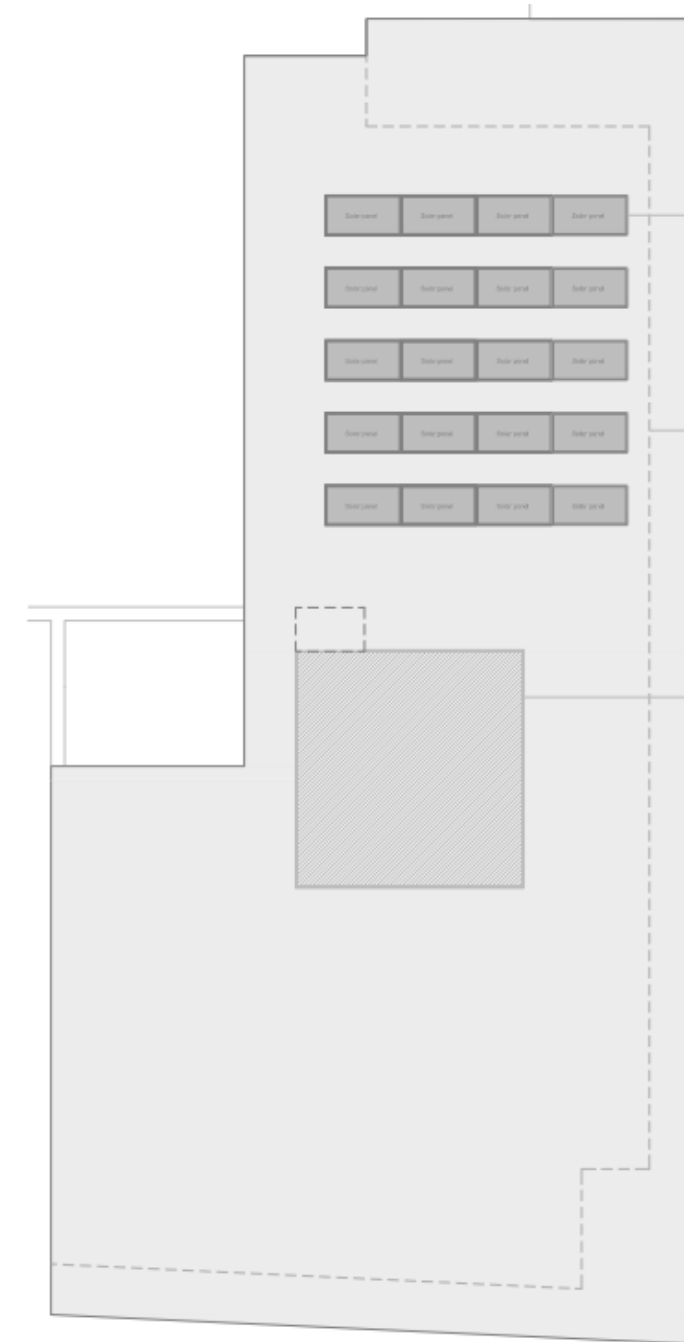


Figure 7 - Indicative Roof Level

1.5.12 The proposed design includes a number of design challenges that should be reviewed at the proceeding design stages, these are as detailed in Table 3.

**Table 3 - Design challenges/risks**

Level	Item	Design challenge/risk	Ref
Ground	Excessive travel distance in commercial unit	The single direction of travel limit within the commercial unit is 20m in line with BS 9999. The commercial unit exceeds this travel distance. A second exit is required.	3.6.3
Ground	Internal ancillary connections	BS 9991 does not support connection of single stair with ancillary areas. This is a deviation from the guidance and connection should be removed.	3.7.2
First Floor	Evacuation lifts	In line with London Plan recommendations, where a lift is provided it should be designed as an evacuation lift serving all levels of the building. Proceeding with the lift serving the first floor only does not align with London Plan policy and should be considered as an approvals risk that should be discussed and agreed with relevant stakeholders.	2.5
Fourth Floor	Private terrace	The travel distances within the terrace on the Fourth Floor Level exceed the recommended 7.5m. An alternative exit from the terrace into a different room should be provided.	3.4.1
First - Fourth Floor	Communal balcony	Communal balcony does not align with recommendations of BS 9991. This arrangement should be considered as an approvals risk that should be discussed and agreed with relevant stakeholders.	3.3.3

## 1.6 Risk profile

- 1.6.1 The commercial unit and ancillary areas should be designed in accordance with the guidance contained in BS 9999:2017.
- 1.6.2 The fire strategy is applicable for the shell and core of the commercial unit, the use of the unit may be subject to change on the final fit out.
- 1.6.3 The risk profiles for the different non-residential areas are summarised in Table 4.

**Table 4 - Risk profile summary**

Area	Occupancy characteristics	Fire growth rate	Risk profile
Ancillary areas	A - Awake and Familiar	2	A2
Commercial unit	B - Awake and Unfamiliar	2	B2

(1) To create the Risk Profile, the fire growth rate for each area has been reduced based on sprinkler protection being provided.

## 1.7 Design occupancy

- 1.7.1 The number of occupants expected in the non-residential areas is to be calculated to ensure that the number and width of exits have sufficient capacity for means of escape.
- 1.7.2 It is considered that ancillary areas, plantrooms, and similar spaces will be occupied infrequently and therefore the occupancy of these spaces is not expected to exceed more than 60 persons.

- 1.7.3 The occupancy for commercial units is to be developed for shell and core only, and therefore the use of the commercial areas has not yet been determined. Based on this, a floor space factor of 1m<sup>2</sup>/person has been adopted within the commercial areas.
- 1.7.4 The maximum design occupancy noted in table below has been calculated based on the floor space factor provided in BS9999.

**Table 5 - Design occupancy**

Level	Space	Area	Floor space factor	Risk profile
Ground	Commercial unit	335 m <sup>2</sup>	1 m <sup>2</sup> /person	60 <sup>(1)</sup>

(1) The occupancy has been limited to 60 people due to the provision of a single means of escape.

## 2. ACTIVE FIRE SAFETY SYSTEMS

### 2.1 Automatic detection and alarm systems

2.1.1 The fire detection and alarm system recommendations across the development are summarised in Table 6.

**Table 6 - Minimum recommended fire detection and alarm system**

Accommodation	Minimum recommendations
Residential flats	Residential flats are to be provided with a minimum of a Grade D, Category LD1 detection and alarm system, designed and installed in accordance with BS 5839-6 [7] A Grade D1 system is recommended for rented units, while owner-occupied units should be provided with a Grade D2 system. Where access from a balcony area is via a cooking space, sounders should be provided on the balcony which should be linked to the access room. Sounders are required on all balconies unless kitchens within the flats are enclosed.
Communal areas	The communal areas will be provided with an L5 automatic fire detection and alarm system designed and installed in accordance with the recommendation in BS 5839-1 [8] The system is intended to activate elements of the smoke control system (e.g., AOVs) within the communal areas only, and it will not provide an audible alarm within the building. It is recommended that the detector head spacing for the L5 system within the corridors and stairs is in accordance with the recommendations for a category L4 system.
Ancillary areas	An automatic fire detection and alarm system equivalent to an L2 standard, designed and installed in accordance with BS 5839-1 should be provided in the ancillary spaces (e.g., refuse store).
Commercial Unit	Manual system conforming to BS 5839-1. This would constitute a shell and core system. Individual fit-out strategies for these units will be required in the future.

### 2.2 Automatic suppression systems

- 2.2.1 The building features a top storey height greater than 11m above Ground Floor Level, and therefore an automatic fire suppression system will be provided throughout the building.
- 2.2.2 Automatic suppression should be provided by a sprinkler system designed in accordance with BS 9251:2021. As such, a Category 2 system should be provided within each of the flats (including any common corridors).
- 2.2.3 The commercial areas and ancillary areas should be provided with an automatic suppression system in accordance with BS EN 12845:2015. As such, a Category OH3 sprinkler system should be provided within the commercial area.
- 2.2.4 In instances where the floor area of the ancillary accommodation/commercial units is less than 100m<sup>2</sup>, it may be possible to extend the residential system to provide sprinkler coverage in these spaces.
- 2.2.5 The design, installation and commissioning of the sprinkler system should be carried out by a sprinkler specialist.

### 2.3 Smoke ventilation systems

#### Stair

2.3.1 A 1.0m<sup>2</sup> AOV should be provided at the head of the stair, the AOV should conform to BS EN 12101-2 [9].

#### Balcony/Deck Approach

2.3.2 The staircase is separated from the flats by a balcony/ deck. The balcony/ deck is open to external air.

### 2.4 Electromagnetic locking/hold-open devices

- 2.4.1 Where doors are provided with electromagnetic locking or hold-open devices, these devices are to operate (either release the door to close normally, or release the door to be opened: upon:
- Activation of the detection and alarm system
  - Failure of the power supply
  - Operation of a hand operated switch located to the side of the door;
  - Malfunction.

### 2.5 Evacuation lifts

- 2.5.1 In accordance with applicable guidance within BS 9991 at the time of writing this report, provision of an evacuation lift is not required. However, the building will be provided with an evacuation lift in order to align with the requirements of London Plan Policy D5.
- 2.5.2 The residential areas of the building will be provided with an evacuation lift serving the First Floor. It is recommended that evacuation lifts will be designed and installed in accordance with the relevant provisions of BS EN 81-20 [10] and BS EN 81-70 [11] and provided with a secondary power supply. A type 2 evacuation lift car is recommended, as outlined in Table 3 of BS EN 81-70.
- 2.5.3 An evacuation lift should be provided within this building to align with the requirement of the London Plan, where all building users should be provided with equal means of escape. Where a lift is provided it should be designed as an evacuation lift serving all levels of the building, currently guidance is in relation to provision and operation of evacuation lifts is unclear. Proceeding with the lift serving the first floor only should be considered as an approvals risk that should be discussed and agreed with Building Control and the London Fire Brigade.
- 2.5.4 BS 9991 does not provide guidance in regard to protection of the evacuation lift. However, BS 9991 does allow for lifts to be located within the staircase.
- 2.5.5 The evacuation lift being located within the staircase, would be provided with the same level of protection as the staircase itself. In front of the lift, a refuge point should be provided with an emergency voice communication system (EVC), as indicated in Section 2.6.
- ### 2.6 Emergency Voice Communication System
- 2.6.1 The evacuation lift lobbies are recommended to be provided with an emergency voice communication system (EVC) in accordance with BS 5839-9 [12] and will consist of a Type B outstation which communicates with a receiving station.

## 2.7 Emergency lighting

- 2.7.1 Emergency lighting (within the common areas only) will be installed to provide temporary illumination in the event of failure of the primary power supplies to the normal lighting system. As part of the emergency lighting system, escape lighting will be provided to ensure the escape routes are illuminated at all material times. Adequate artificial lighting will be provided in all common escape routes and will be of a sufficient standard to enable persons to see to escape.
- 2.7.2 Emergency lighting should be installed in accordance with the recommendations of BS EN 5266 [13], BS EN 1838 [14] and BS EN 60598-2-22 [15].

## 2.8 Fire safety signage

- 2.8.1 Fire safety signs will be installed where necessary (common areas only) to provide clear identification of fire precautions, fire equipment and means of escape in the event of fire. All parts of the development will be fitted with appropriate fire safety signage to comply with The Health and Safety (Signs and Signals) Regulations 1996, i.e. signage to be specified in accordance with BS ISO 3864-1 [16], BS 5499-4 [17] and BS 5499-10 [18].

## 2.9 Wayfinding signage

- 2.9.1 The building will have a top storey more than 11m above ground and should therefore be provided with appropriate signage to assist the fire service to identify each floor and flat.

## 2.10 Emergency (life-safety) power supply

- 2.10.1 All life-safety systems will be provided with robust power supplies in accordance with BS 8519 [19]
- 2.10.2 The following fire safety systems will comply with their respective British Standards regarding secondary power supplies:
- Emergency lighting and signage;
  - Automatic fire detection and alarm systems
  - Emergency voice communication systems (EVCs);
  - Automatic smoke ventilation systems.
  - Automatic suppression systems
  - Evacuation lifts.
- 2.10.3 There must be minimal delay in change over if the main power fails and it must occur automatically.
- 2.10.4 Internal dedicated batteries may provide back-up power supply for the fire safety systems as listed above. These batteries should 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.

## 3. MEANS OF WARNING AND ESCAPE

### 3.1 Evacuation Philosophy

- 3.1.1 A defend-in-place strategy, otherwise known as a 'stay-put' strategy should be implemented in the residential units, whereby, in the event of fire, only the unit (flat) of fire origin will receive a signal to evacuate. No other flats will receive an alert notification, though should residents become aware of a fire in another flat they may leave the building if they wish to do so. Further evacuation of other units may also be enacted by the fire and rescue service, as needed depending on the development of fire.
- 3.1.2 The commercial unit should operate completely independently from the rest of the building. Evacuation from this area is based upon simultaneous evacuation, whereby, upon activation of the detection and alarm system, only the commercial unit will receive a signal to evacuate.
- 3.1.3 The ancillary areas should operate a local simultaneous evacuation, whereby upon activation of the detection and alarm system, ancillary accommodation will receive a signal to evacuate. All other areas will not receive a signal to evacuate.
- 3.1.4 The fire detection and alarm system will be configured to support the evacuation philosophy as discussed above.

### 3.2 Horizontal means of escape - Residential areas

#### Internal flats

- 3.2.1 All flats on the Fourth Floor Level are provided with an entrance hall by which all habitable rooms are accessed directly from.
- 3.2.2 All flats will be provided with a protected entrance hall: In accordance with Section 9.4 and Figure 11 of BS 9991, the protected entrance hall should be separated from the rest of the flat by 30 minutes fire-resisting construction. Bathrooms may be included within 30 minutes fire-rated enclosure of the protected entrance hall.
- 3.2.3 The maximum travel distance within the entrance hall is limited to 9m, measured from the flat entrance door to the door of any habitable room. This maximum distance limit is met in all flats in the residential blocks.
- 3.2.4 BS 9991 recommends that cooking facilities are located remotely from the internal flat escape route, it is recommended the cooking facilities are relocated such that they are at least 1.8 m from the escape route.
- 3.2.5 All flats on the First, Second and Third Floor Level will have open plan layouts, i.e., kitchen, dining and living room spaces. Open-plan layouts should be designed in accordance with Section 9.7 of BS 9991 and adhere to the following proviso:
- A grade D1, LD1 detection and alarm system should be provided in accordance with BS 8539-6;
  - A sprinkler system should be provided throughout the flat;
  - The flats should be located on a single level only;
  - The size of the flat should not exceed 16m x 12m;
  - Ceiling within the flat should have a minimum height of 2.25m;
  - The kitchen should be enclosed in open-plan flats having an area exceeding 8m x 4m. Cooking areas should not be adjacent to the entrance of the flat, regardless of flat size.

3.2.6 Regarding the final point above, the restriction on the flat size of 8m x 4m before enclosing the kitchen is quite restrictive in the design of open-plan flats. As such, further research (beyond the research carried out by the BRE and commissioned by the NHBC Foundation on open-plan flat design - NF19) has been carried out (Open plan apartments - revisiting risks in light of contemporary demands. IFE Journal Issue No 18, November 2016 [20]). The results of the additional research were published within the IFE journal and demonstrated that flats with a size greater than 8m x 4m with the kitchen open to the living area had a similar or better results than when compared to the scenarios with the kitchen enclosed.

3.2.7 Cooking facilities in these units should not be sited adjacent to the flat entrance and internal escape routes. It is recommended that the hob is located a minimum of 1.8m away from the escape route.

### 3.3 Horizontal means of escape - Upper levels

- 3.3.1 Horizontal means of escape from flats on the upper floors is facilitated by a balcony/ deck. The escape arrangements should align with recommendations within Section 7.3 and Figure 5(b) of BS 9991.
- 3.3.2 Balcony/deck should meet the following recommendations.
1. The structure, including the floor, should be protected by 60-minute fire-resisting construction (integrity and insulation).
  2. The walking surface should be imperforate.
  3. The sectional profile should be such that any fire plume breaking out of a flat is directed outwards and upwards, and should be arranged such that smoke does not leak laterally along the soffit. Balconies should be as open as possible to allow for the dispersal of smoke originating in a flat. At least 50% of the vertical section should be open and the area of opening should be uniformly spread around the surface. The opening for ventilation should be at least between the top of the balustrade at 1.1 m and the soffit to the balcony above.
  4. The soffit above a balcony or deck having a width of more than 2 m should be designed with down-stands placed at 90° to the face of the building (on the line of separation between individual flats). Down-stands should project 0.3 m to 0.6 m below any other beam or down-stand parallel to the face of the building, or should be determined by calculation.
  5. Where the balcony or deck is adjoined to the building wall only at the place where there is an entrance to a flat, unless it is a minimum of 1.8 m away from the face of the building, it should, in the case of single direction escape routes, be proven by calculation that the escape route is not subjected to hazardous exposure levels or smoke-logging.
  6. Balconies providing a single direction of escape should be further safeguarded by the following provisions.
    - i. The face of the building (excluding window openings) should provide at least 30 min fire resistance.
    - ii. Doors opening onto the balcony should be FD 30 self-closing doors.
    - iii. Window openings should not extend below a height of 1.1 m above the deck level.
    - iv. The external balustrade should be imperforate.
    - v. Surface materials of the facing wall, balcony soffit and balustrade should be of a class A2-s1, d0 rating.
  7. The length of balconies should be such that no point in any flat is more than 45 m from a rising main landing valve or the approach position of a fire appliance (measured along the firefighting

3.3.3 Within the proposal, a portion of the balcony is enclosed on three sides, and therefore does not align with the recommendation noted in point 3 above. This is a deviation from the guidance and represent an approval risk until discussed and agreed with relevant stakeholders such as Building Control.

3.3.4 Following a review of the proposal, the following points are provided for Building Control consideration:

- BS 9991:2015 supports a travel distance of 15m from flat entrance door to stair door within an enclosed corridor, based on sprinkler provision. The corridor in this proposal could be provided with smoke ventilation via a 1.5m<sup>2</sup> AOV on the external wall, which is much less than the area of permanent openings. The current proposal is provided with multiple permanent openings, each providing circa 6.2m<sup>2</sup> of ventilation.
- Current proposal includes a balcony approach which has a travel distance of circa 14.0m and is provided with smoke ventilation via permanent openings in the facade. The current travel distance is less than the limit supported by BS 9991:2015 in enclosed corridor ventilated with a 1.5m<sup>2</sup> AOV.

3.3.5 The above points are provided for Building Control consideration, which might have additional requirements to support this proposal.

3.3.6 Figure 8 - Enclosed corridor (upper figure), compliant balcony layout, and the current design below shows a typical enclosed corridor arrangement, a BS9991 balcony approach, and the current design:

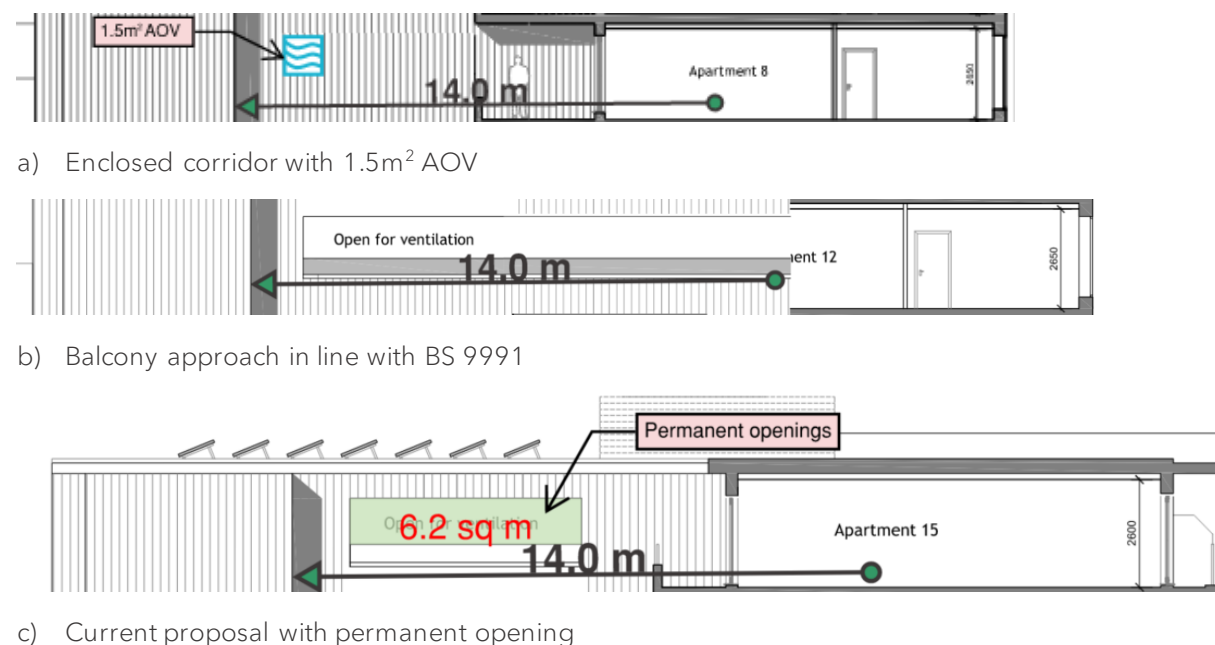


Figure 8 - Enclosed corridor (upper figure), compliant balcony layout, and the current design

3.3.7 The common stair within the building will be provided with a stair of acceptable width for everyday use. It should be noted that other standards, such as Approved Document M and K, may have more onerous requirements.

3.3.8 Where handrails intrude 100mm or less, these can be ignored when assessing the clear width of the common stair. The width of the stair should be kept free for a vertical distance of 2m.

3.3.9 A lift is provided to serve First Floor only. In line with recommendations of London Plan, the lift should be designed as an evacuation lift. The lift should serve every floor. Currently, the lift does not serve 2<sup>nd</sup> to 4<sup>th</sup> Floor. This arrangement does not align with London Plan recommendations for an inclusive design.

3.3.10 Figure 9 illustrates the means of escape from the upper levels of the building.

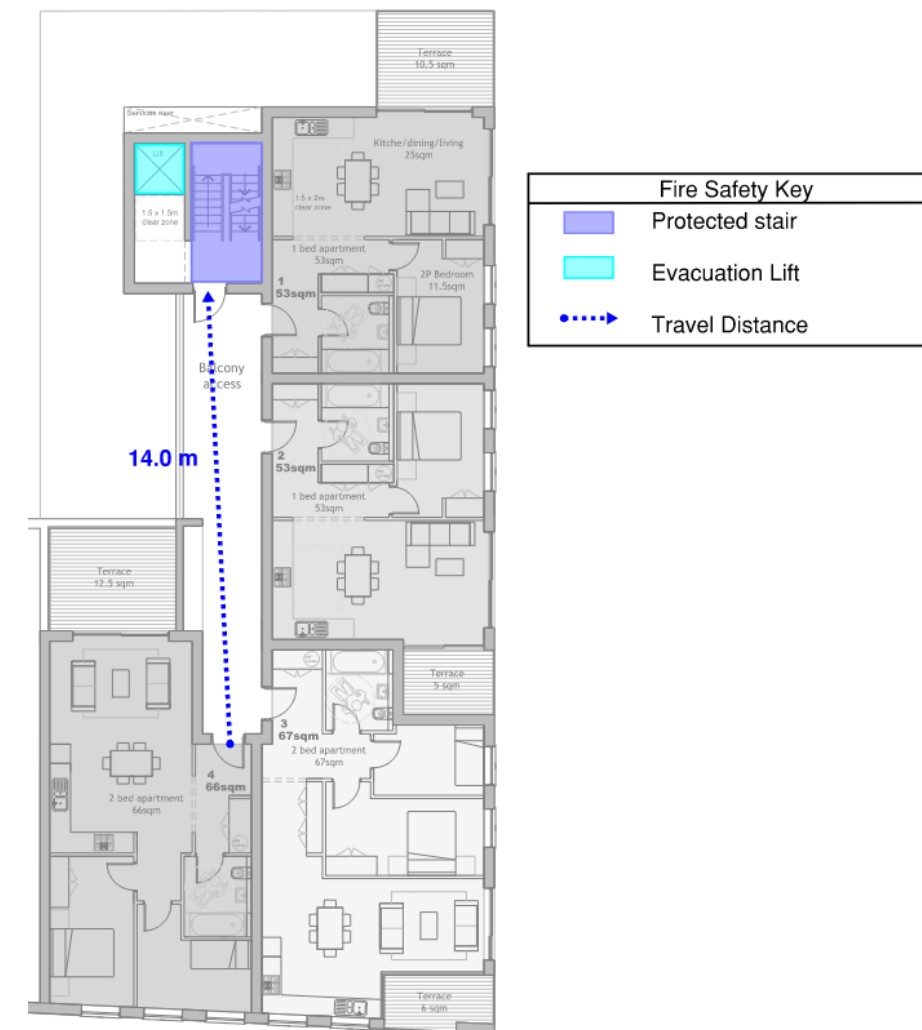


Figure 9- Upper Floor means of escape.

### 3.4 Private balconies and terraces

3.4.1 Private balconies should meet the following recommendations:

- The escape route from the balcony should not pass through more than one access room;
- A fire detection and alarm system in accordance with BS 5839-6 is provided to the access room with an alarm system on the balcony;
- Maximum permitted travel distance from the balcony access door to the furthest point of the balcony is 7.5m; alternatively, a separate exit into a different room should be provided; and

3.4.2 Balconies and terraces should be designed in accordance with BS 8579:2020. In accordance with BS 8579 [21], vertically stacked balconies and any balconies within buildings with a top floor located above 11m are to be constructed of materials class A2-s1, d0 or better. Terrace build-ups should achieve BROOF(t4).

### 3.5 Horizontal means of escape – ground floor level

3.5.1 At Ground Floor Level, the stair and lift discharge to outside via a dedicated protected passageway onto Albion Road. The protected passageway should be afforded the same level of fire resistance as

the stair itself (i.e., separated from all areas via 60 minutes fire resistance), and should remain fire sterile.

- 3.5.2 All ancillary areas and commercial unit should discharge independently from the stair/lift lobby. The cycle store connects to the residential passageway. Please note that this is not supported by prescriptive guidance and internal connection should be removed.
- 3.5.3 The commercial unit should be provided with an independent means of escape directly outside and should be separated from the rest of the building by a compartment wall, achieving the same fire resistance as the elements of structure.
- 3.5.4 Any post boxes located in the exit passageway should be made of non-combustible materials and should achieve a minimum of 30 minutes fire resistance, exit passageways/lobbies forming part of the passageway should be maintained as fire sterile areas.
- 3.5.5 Figure 10 illustrates the means of escape from Ground Floor Level.

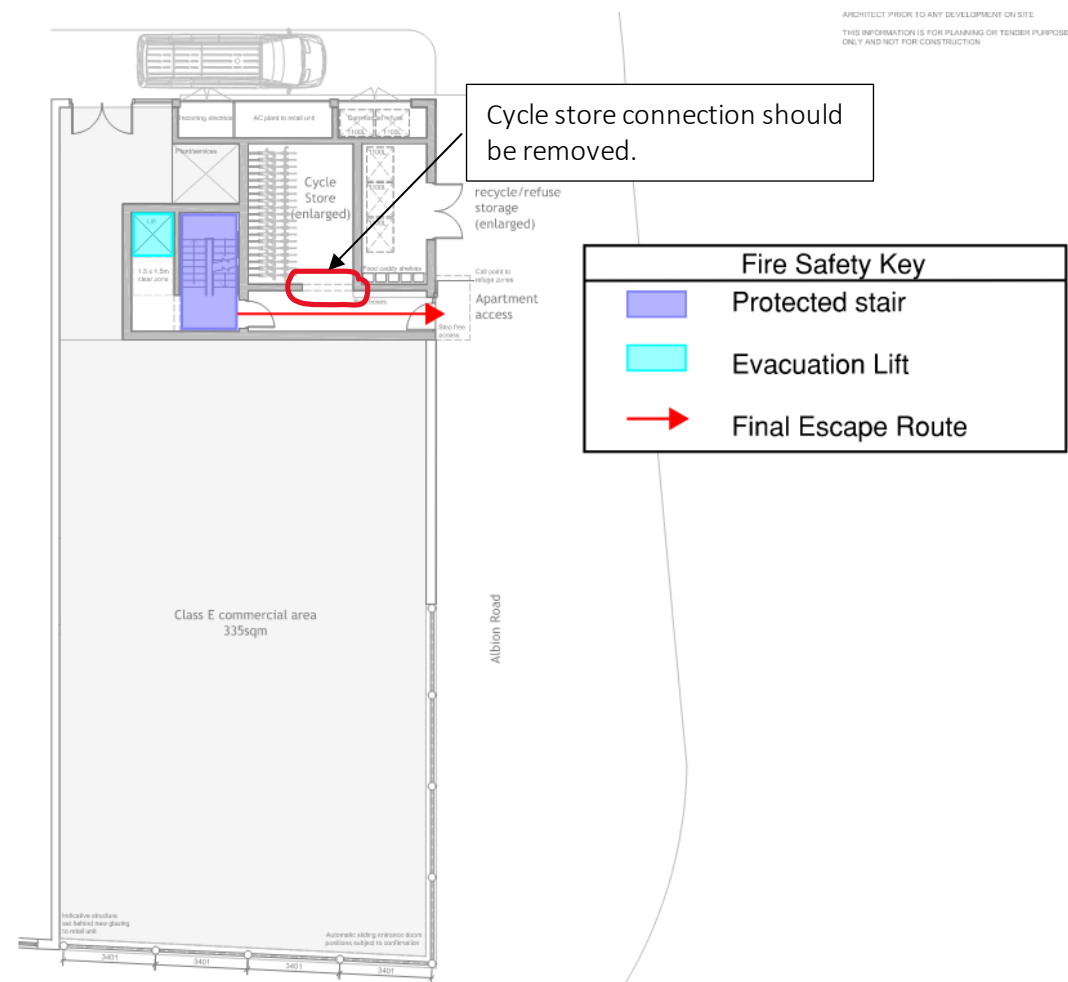


Figure 10 - Ground Floor means of escape.

### 3.6 Horizontal means of escape - commercial unit

- 3.6.1 A commercial unit will be provided at Ground Floor Level, which should be accessed directly from outside.; the commercial unit should not connect with residential areas and should be separated from the residential areas by a compartment wall, achieving the same fire resistance as the elements of structure.

- 3.6.2 This fire strategy is concerned only with the shell and core of the commercial unit, it will be the responsibility of the tenant to provide a detailed fire strategy at fit out stage. As detailed in Section 1.6, the risk profile assigned to the non-residential units is B2 for the commercial unit.
- 3.6.3 The maximum permitted travel distances within the commercial unit is detailed in Table 7. Travel distances in the commercial unit are in excess of the maximum permitted travel distance. A second exit should be provided to meet travel distance limitations.

Table 7 - Maximum travel distance in commercial area

Accommodation	Risk Profile	Maximum travel distance in single direction (m)		Maximum travel distance in multiple directions (m)	
		Direct	Actual	Direct	Actual
Commercial unit	B2	13	20	33	50

The above figures are for the actual travel distance, applicable where the internal layout is known. Where the internal layout is not known, the travel distance shall be limited to two-thirds of the above figures. The direct travel distances are used where the layout is unknown.

- 3.6.4 The maximum exit width depends upon the number of occupants required to use them and the capacity factor. The storey exit capacity factor for a B2 risk profile is 4.1 mm/ person.
- 3.6.5 The exits from the commercial unit should have a minimum clear width in accordance with Table 8.

Table 8 - Maximum travel distance in commercial area

Area	Estimated design occupancy	Minimum number of exits required <sup>(1)</sup>	Minimum clear width (mm) per person <sup>(2)</sup>	Minimum clear width (mm) for each door <sup>(3)</sup>	Resulting exit capacity per person
Commercial unit	335	2 exits <sup>(1)</sup>	4.1	850mm	60 people <sup>(4)</sup>

1) As per Table 10 of BS 9999:2017.  
 2) Minimum clear widths as Per Table 12 of BS 9999:2017.  
 3) Minimum no. of exits required at all times; Note that were two exits to be provided the largest exit should be discounted and the remaining exit should have sufficient capacity to serve all the occupants in the space exits discounted during this exercise.  
 4) Due to the current provision of a single means of escape within the commercial area, the occupancy of this space is to be 60 people.

- 3.6.6 Doors hung to swing against the flow of escaping occupants are to serve a maximum of 60 people, irrespective of the available clear exit width. Where wheelchair users are expected, doors should have at least 850mm clear width.
- 3.6.7 Where double doors are provided, the width of one of the leaves should be not less than 800mm.
- 3.6.8 The above recommendations are to be reviewed during the fit-out of those units. The fire safety strategy for the commercial spaces is concerned with the shell and core of these spaces only. Demonstrating compliance with Part B for the fit-out of these units will be the tenant's responsibility.
- 3.6.9 Figure 11 illustrates the means of escape from the commercial unit on Ground Floor Level.

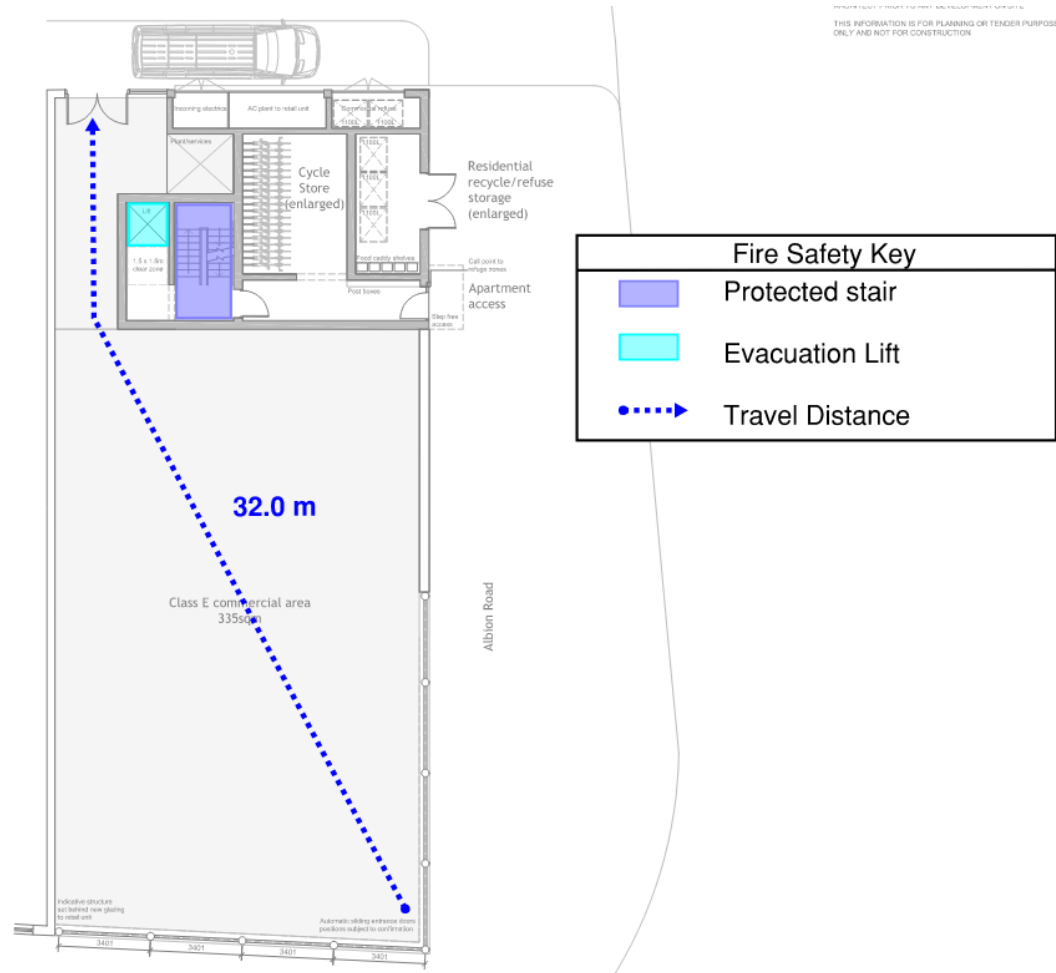


Figure 11 - Commercial unit means of escape

### 3.7 Horizontal means of escape - ancillary areas

- 3.7.1 Ancillary accommodation is located at Ground Floor Level. The accommodation consists of a refuse store, a cycle store and various plant rooms.
- 3.7.2 The internal ancillary areas are not permitted to connect with the residential areas. Independent external access is required for these areas i.e., cycle store.
- 3.7.3 Where the occupancy of a space is more than 60 people, the doors used for final exit should be arranged to open in the direction of escape. The maximum permitted travel distance for ancillary areas are summarised in Table 10.

Table 9 - Maximum travel distance in ancillary areas

Accommodation	Risk Profile	Maximum travel distance in single direction (m)		Maximum travel distance in multiple directions (m)	
		Direct	Actual	Direct	Actual
Ancillary areas	A2	15	22	37	55

The above figures are for the actual travel distance, applicable where the internal layout is known. Where the internal layout is not known, the travel distance shall be limited to two-thirds of the above figures. The direct travel distances are used where the layout is unknown.

3.7.4 The exit doors are required to have a minimum clear width of 800mm, or 850 mm where unassisted wheelchair users are expected. The minimum clear width should be measured in accordance with Figure 12.

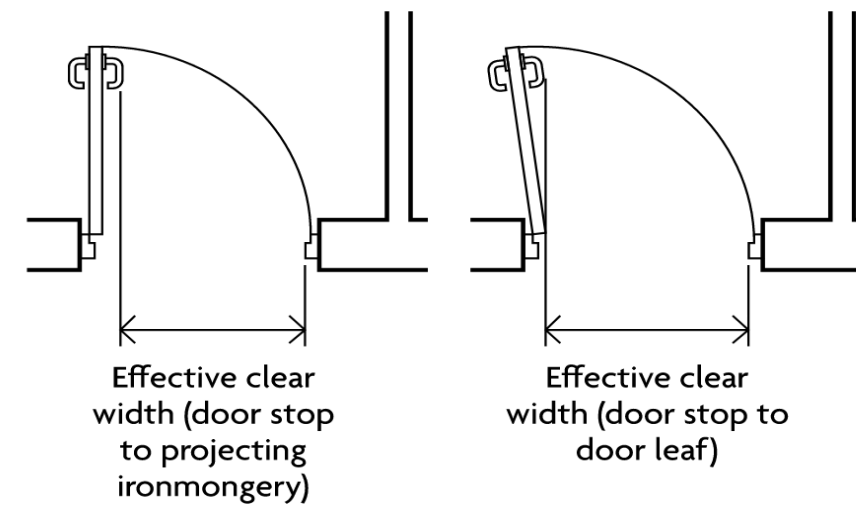


Figure 12 - Measurement of clear width

### 3.8 Vertical means of escape

- 3.8.1 In accordance with BS 9991, the minimum required stair width is 1000mm.
- 3.8.2 It should be noted that wider stairs may be required by other guidance documents, such as Approved Document K [22] and Approved Document M [23].
- 3.8.3 The width of the stair should be kept clear from a vertical distance of 2m. Where handrails and strings intrude 100mm or less, these can be discounted when assessing the clear width of the escape stair.
- 3.8.4 The flights and landings of communal escape stairs should be constructed of materials achieving class A2-s3, d2 or better.
- 3.8.5 Vertical means of escape should be supported by an evacuation lift in accordance with London Plan policy requirements. The final escape route from the evacuation lift should have the same level of protection at Ground Floor Level as the evacuation lift on the upper floors. Currently the lift does not serve every floor. This proposal does not align with London Plan recommendations.
- 3.8.6 The residential entrance lobby through which the stair and evacuation lift discharge should be fire sterile.

### 3.9 Final exit and onward escape

- 3.9.1 Travel beyond the building final exit must be away from the building, towards a place of safety, and not be jeopardised by unprotected openings of the building.
- 3.9.2 In general, the building should be provided with escape routes, upon exiting the building that are either directly away from the building or via an alternate path along the building façade. Where the external escape route continues in a single direction along the façade, the external wall adjoining the escape route should have a minimum of 30 minutes fire resistance (integrity and insulation).



## 4. PASSIVE FIRE PROTECTION SYSTEMS

### 4.1 Internal wall and ceiling linings

- 4.1.1 All wall and ceiling linings within the building should meet the recommendations of Section 20.1 of BS 9991 when tested under the European Classification (in accordance with BS EN 13501-1 [24]) as summarised in Table 10.
- 4.1.2 The surface linings of walls and ceilings should generally conform to the classification recommended above for the appropriate location. However, parts of walls in rooms may be of a lower class but not lower than European Class D-s3, d2, provided that the floor area of those parts in any one room does not exceed half of the floor area of the room, subject to a maximum area of 60 m<sup>2</sup> in non-residential areas and 20m<sup>2</sup> in residential areas.

**Table 10 - Surface spread of flame requirements**

Location	Euro Class
Small rooms ≤4m <sup>2</sup> (residential and ancillary)	D-s3, d2
Circulation spaces (communal)	B-s3, d2
Circulation spaces (within dwellings)	C-s3, d2
Other rooms	C-s3, d2

### 4.2 Rooflights and thermoplastic materials

- 4.2.1 Any non-plastic rooflights are to meet the recommendations of Table 10.
- 4.2.2 Where thermoplastic materials are used in the building, these are to comply with the various recommendations provided in Sections 18.6.2 in BS 9991.

### 4.3 Structural fire resistance

- 4.3.1 The required period of fire resistance of the structural elements has been based upon the recommendations in Table 11 for a block of flats with a top floor height of less than 18m. As such, elements of structure are to achieve at least 60-minutes fire resistance (loadbearing capacity only).
- 4.3.2 Where a construction element with lower fire resistance supports or provides stability to another element of structure, then the protection to the supporting structure should be at least the same as the structure it is supporting.
- 4.3.3 Elements of structure that only support a roof do not require fire resistance. Elements of structure supporting an additional load to the roof (e.g., roof plant) or essential to the stability of a fire-resisting wall (internal or external) are considered to support more than only a roof. Where this is the case, the structural elements are required to achieve the same fire resistance rating as described in section 4.3.1. PV panels are not considered to constitute plant.

### 4.4 Compartmentation and fire-resisting construction

- 4.4.1 All floors within the building are required to be compartment floors with at least the 60 minutes fire resistance.
- 4.4.2 Each flat is to be designed as a separate fire compartment. The walls separating the flat from all other areas are required to have a minimum of 60 minutes fire resistance.

- 4.4.3 All shafts (e.g., service risers, etc) are to be constructed as protected shafts achieving at least 60 minutes fire resistance and be provided with 30 minutes fire-rated smoke sealed doors (FD30S). Electricity meters should be located in securely locked cupboards.
- 4.4.4 Gas service and installation pipes and meters should not be within a protected stairway, unless installed in accordance with the Pipelines Safety Regulations 1996 [25] and the Gas Safety (Installation and Use) Regulations 1998 [26].
- 4.4.5 The non-residential areas (i.e., commercial unit and ancillary areas) will be separated from the rest of the building by compartment walls and floors achieving at least 60 minutes fire resistance. Connections between the ancillary areas and the residential areas are not permitted.
- 4.4.6 The key fire resistance requirements applicable to this development are summarised in Table 11 below:

**Table 11 - Periods of fire resistance for fire-separating elements (in minutes)**

Part of Building	Minimum Fire Resistance rating when tested to the relevant part of BS 476 (mins)			Methods of Exposure
	Loadbearing	Integrity	Insulation	
Structural elements	60	n/a	n/a	Exposed Faces
Compartment Floor	60	60	60	From underside
Compartment / party Walls	60	60	60	Each side separately
External walls: Any part less than 1,000 mm from a point in the relevant boundary	60	60	60	Each side separately
Any part more than 1,000 mm from the relevant boundary (where required)	60	60	15	From the inside
Any part adjacent to an external escape route	30	30	30	From the inside
Protected Shafts (risers, lift stair, etc)	60	60	60	Each side separately
Protected enclosure Not forming part of a compartment wall or shaft to a lobby or corridor Protected entrance hall	30	30	30	Each side separately
Cavity barriers	n/a	30	15	Each side separately

Note: The loadbearing ('R') rating only applies to elements which are loadbearing.

## 4.5 Fire doors

4.5.1 Fire doors should be provided as summarised in Table 12, in accordance with the recommendations of BS 9991.

4.5.2 Fire door assemblies will comply with:

- BS 476-22 [27] or BS EN 1634-1 [28] and BS EN 1634-2 [29] for door hardware & fire resistance; and where applicable,
- BS 476-31 [30] or BS EN 1634-3 [31] or smoke leakage.

**Table 12 - Fire Doors**

Position of Door	Tested to BS 476-22	Tested to BS EN1634-2
Enclosing a protected shaft / riser	FD 30 S	E 30 S <sub>a</sub>
Enclosing ancillary accommodation	As per the wall it is fitted in	As per the wall it is fitted in
Enclosing a lift shaft	FD 30	E 30
Enclosing a protected stair	FD 30 S	E 30 S <sub>a</sub>
Flat entrance doors	FD 30 S	E 30 S <sub>a</sub>
Doors to internal protected entrance halls /protected stairway fire resisting partition	FD 30	E 30

Notes:  
 The ratings shown above are for integrity only.  
 Smoke seals are indicated by the suffix 'S' (to BS 476-31 [30]) or S<sub>a</sub> (to BS EN 1634-3 [31]) and are required in all doors which form the enclosure to protected escape routes.  
 All fire doors should be self-closing except for doors which are normally locked shut, such as to places of special fire hazard or service risers, which should also be provided with appropriate signage.

## 4.6 Fire-stopping and penetrations through fire-resisting construction

4.6.1 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 space. Penetrations through lines of fire-resisting separation should be fire-stopped using a system which will achieve the same fire resistance rating as the penetrated wall or floor.

## 4.7 Protection of ductwork

4.7.1 One of the following methods is to be implemented where a ventilation duct passes through a fire resisting element to maintain the integrity of the element being breached:

- Protection using fire and smoke dampers activated upon smoke detection (ES-type dampers). It should be noted that fire dampers only are not suitable to protected escape routes;
- Protection using fire-resisting enclosure achieving the fire resistance rating equivalent to the highest rated compartmentation it penetrates;
- Protection using fire-resisting ductworks achieving the fire resistance rating equivalent to the highest rated compartmentation it penetrates.

4.7.2 Any extraction ductwork serving the kitchen is recommended to avoid passing through fire-resisting construction where possible. If this cannot be avoided, then the ductwork should not be fitted with dampers, and should instead be fire-resisting or be enclosed within fire-resisting construction.

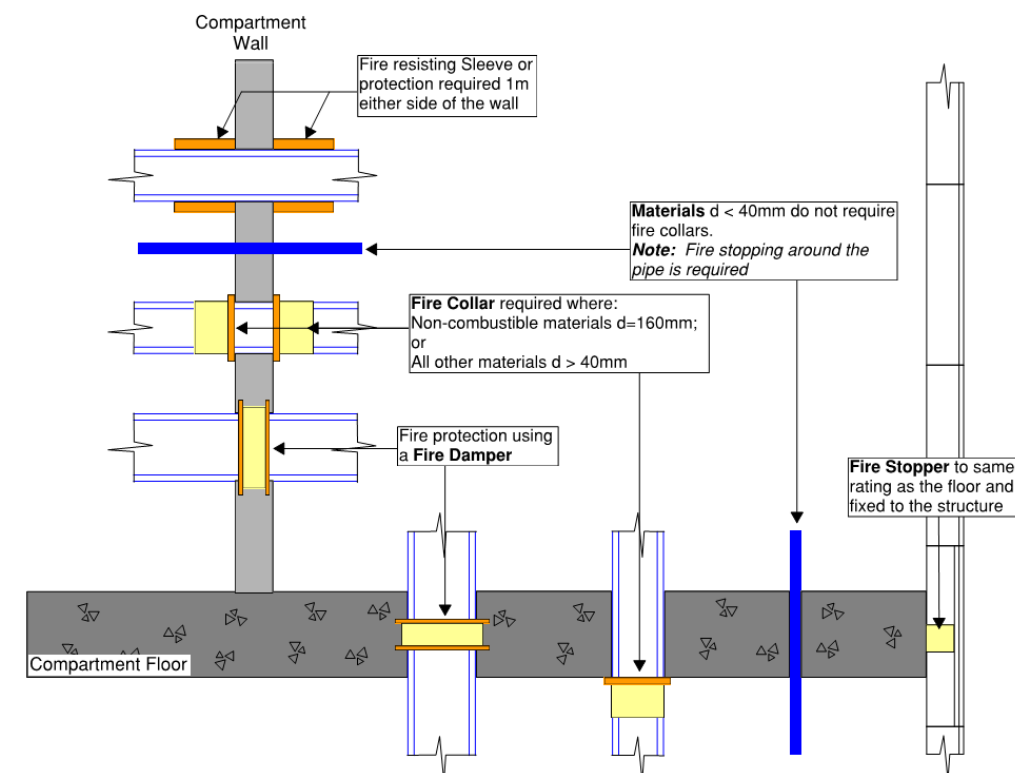
## 4.8 Cavity barriers and concealed spaces

4.8.1 Cavity barriers are provided in order to prevent the rapid spread of unseen fire or smoke in voids, and to prevent the spread of fire around compartmentation via voids. Extensive internal concealed cavities (e.g., roof voids or the void between suspended ceilings and the soffit of the floor above) generally require cavity barriers to sub-divide them.

4.8.2 All cavity barriers should have a fire resistance rating of at least 30 minutes for integrity (E) and 15 minutes for insulation (I). In general, cavity barriers should be at 20 m centres in cavities with exclusively Class C-s3, d2 linings or better. For other linings, the spacing between cavity barriers should be reduced to 10 m.

4.8.3 Cavity barriers provided around openings within the external wall may be formed of:

- steel at least 0.5mm thick or timber at least 38mm thick; or
- polythene-sleeved mineral wool, or mineral wool slab under compression when installed cavity; or
- calcium silicate, cement-based or gypsum-based boards at least 12mm thick.



**Figure 13 - Fire stopping expectations.**

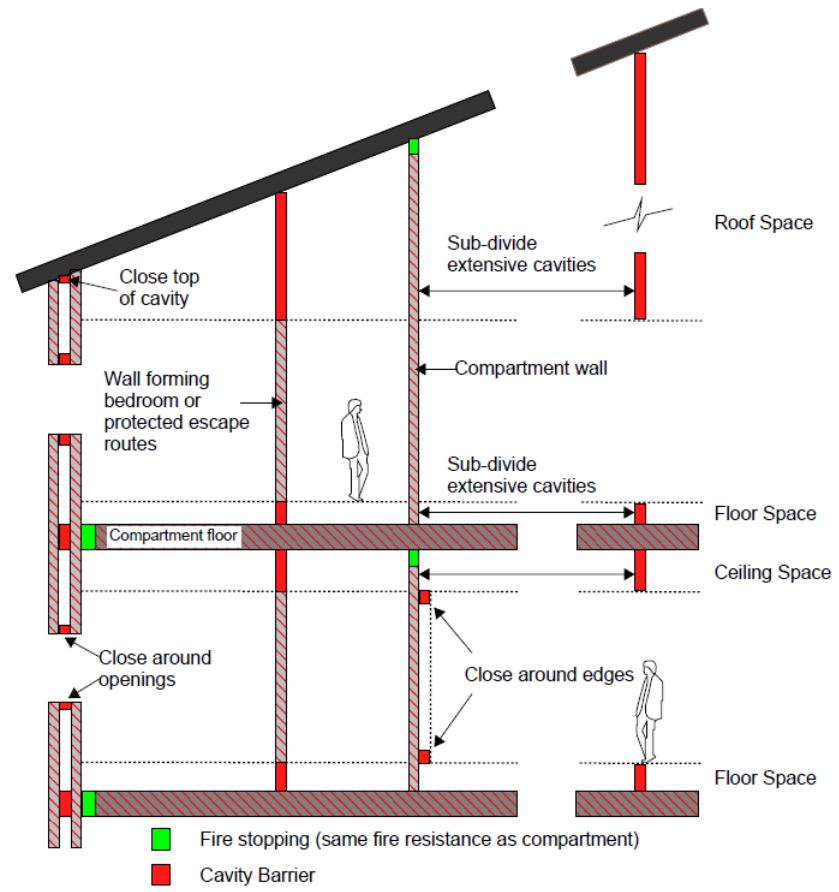


Figure 14 - Cavity barrier and fire stopping locations.

## 5. EXTERNAL FIRE SPREAD

### 5.1 External wall construction

- 5.1.1 As the building will contain one or more dwellings, an institution or a room for residential purposes but will not have a floor at a height greater than 18m above Ground Floor Level, it is not considered to be a 'relevant building' under Regulation 7(4) of the Building Regulations.
- 5.1.2 The following recommendations highlight the minimum required provisions to satisfy the minimum recommendations of fire safety guidance. However, it is recommended that where Regulation 7(2) is not followed, lenders and other project stakeholders are consulted as they may have more onerous requirements for the external wall.
- 5.1.3 The external walls within buildings with a top floor height between 11m and 18m above ground should achieve either of the following:
- Meet the performance criteria given in BRE report BR 135 [32] for cladding systems using full-scale test data from BS 8414-1 [33] or BS 8414-2 [34]; or
  - Meet the following recommendations:
    - External surfaces should meet the recommendations in Table 13 below; and
    - Cavity barriers should be provided in accordance with Section 4.8 of this report.

**Table 13 - Reaction to fire performance of external surface of walls.**

Building Type	Top Storey Height	Less than 1m from the boundary	More than 1m from the boundary
All residential purpose groups (purpose groups 1&2)	More than 11m	Class A2-s1, d0 or better <sup>(1)</sup>	Class A2-s1, d0 or better <sup>(1)</sup>
Notes:			
1) Profiled or flat steel sheet at least 0.5mm thick with an organic coating of no more than 0.2mm thickness is also acceptable.			

- 5.1.4 In buildings with a residential storey more than 11m above ground, 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 the external walls will be specified to achieve a class A2-s1, d0 or better in accordance with BS EN 13501-1.
- 5.1.5 Any balconies will be specified to meet either of the following conditions:
- a) Only contain materials achieving class A1 or A2-s1, d0, except for any of the following:
- Cavity trays when used between two leaves of masonry;
  - Intumescent and fire-stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1 to the Building Regulations 2010;
  - Membranes;
  - Seals, gaskets, fixings, sealants and backer rods;
  - Thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1 of the Building Regulations 2010;

- Any material achieving class A1fl or A2fl-s1 when it forms the top horizontal floor layer of a balcony and is provided with an impermeate substrate under it which extends to the full size of the class A1fl or A2fl-s1 material;
  - Electrical installations; and
  - Fibre optic cables.
- b) Achieve both of the following conditions:
- Have an impermeate soffit which extends to the full area of the balcony, achieves a minimum REI 30 rating and is constructed of materials achieving class A2-s1, d0 or better; and
  - Materials achieving class B-s1, d0 or worse extending beyond the boundary of a single compartment will include a band of material rated class A2-s1, d0 or better, a minimum of 300mm in width centred on that boundary line.

- 5.1.6 Regulation 7(1A) prohibits the use of relevant metal composite materials in the external walls of all buildings of any height. The definition of a relevant metal composite material is given in Regulation 2(6)(c).
- 5.1.7 Balconies and terraces are to be provided in accordance with the recommendations in BS 8579. As the building has a floor more than 11m above ground, stacked balconies will be constructed from materials achieving class A1 or A2-s1, d0 in accordance with BS EN 13501-1.

### 5.2 Roof coverings

- 5.2.1 Roof coverings are recommended to be resistant to fire spread where either close enough to a boundary to be at risk of ignition from a fire in other buildings or where needed to avoid fire spread between compartments via the roof covering.
- 5.2.2 The relevant test and classification standards for the external fire performance of roof systems is BS EN 13501-5 [35] (European Class).
- 5.2.3 Roof coverings refer to a construction that can consist of one or more layers of material but does not refer to the roof structure as a whole.
- 5.2.4 Table 14 below summarises the separation distances from the boundary according to the type of roof coverings as described in Section 35.4 of BS 9991.

**Table 14 - Limitations on roof coverings**

Distance from relevant boundary	European Class	B <sub>ROOF</sub> (t4)	C <sub>ROOF</sub> (t4)	D <sub>ROOF</sub> (t4)
Less than 6m		✓	✗	✗
At least 6m		✓	✓	✗
At least 20m		✓	✓	✓

### 5.3 Space separation and unprotected areas of the façade

- 5.3.1 Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls. This heat can be enough to set fire to nearby buildings. 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, known as the unprotected area.
- 5.3.2 The relevant boundaries are the reference point at which the potential for fire spread, being:

- the site boundary;
- a notional boundary created on the centreline of an adjacent carriage way; or
- a notional boundary created midway between this building and the nearest adjacent building.

5.3.3 In accordance with BS 9991 guidance, only small, unprotected areas in an otherwise protected façade do not contribute to the extent of unprotected area. These are shown in Figure 15.

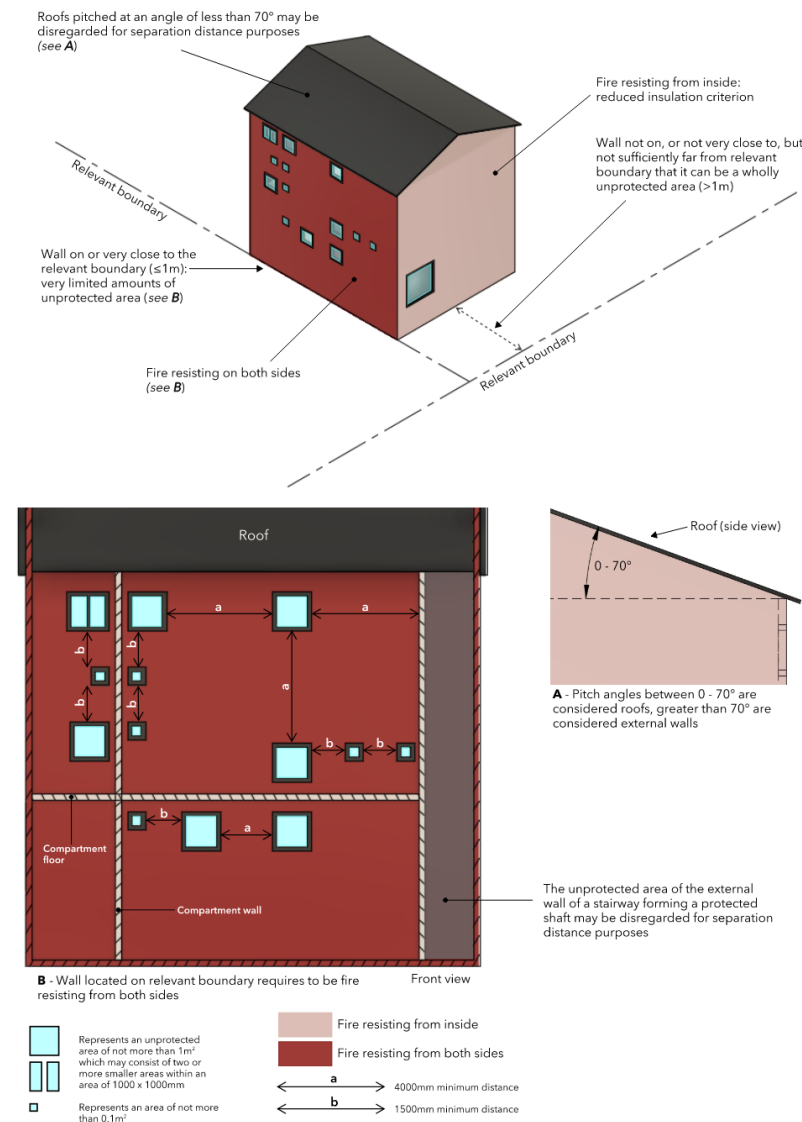


Figure 15 - Exclusion from unprotected area calculations

- 5.3.4 Where an external wall is within 1.0m from the relevant boundary, that external wall will have 0% unprotected area (with the exception of areas shown in Figure 15 and is required to achieve the fire resistance detailed Table 11).
- 5.3.5 Where an external wall has the appropriate standard of fire resistance but has a surface material classified as less than European Class B-s3, d2 and is more than 1mm thick, that part of the wall will be classified as an unprotected area equating to half its area.
- 5.3.6 The allowable unprotected areas have been assessed using the enclosing rectangle method of the BRE report BR 187 [36], taking into account the compartment dimensions and specified emitter radiation intensities.

5.3.7 Two radiation intensities have been adopted as recommended in BRE 187, corresponding to a standard and reduced fire load density, depending on the different occupancy types, as follows:

- 84 kW/m<sup>2</sup> for residential spaces; and
- 168 kW/m<sup>2</sup> for commercial and ancillary spaces

5.3.8 Indicative measurements between the building elevations and associated relevant boundaries are shown in Figure 16

5.3.9 The results of the analysis representing the worst-case scenarios are represented in Table 15 below. This table indicates the allowable unprotected area for the fire compartments on each elevation in relation to their distance from the relevant boundary.

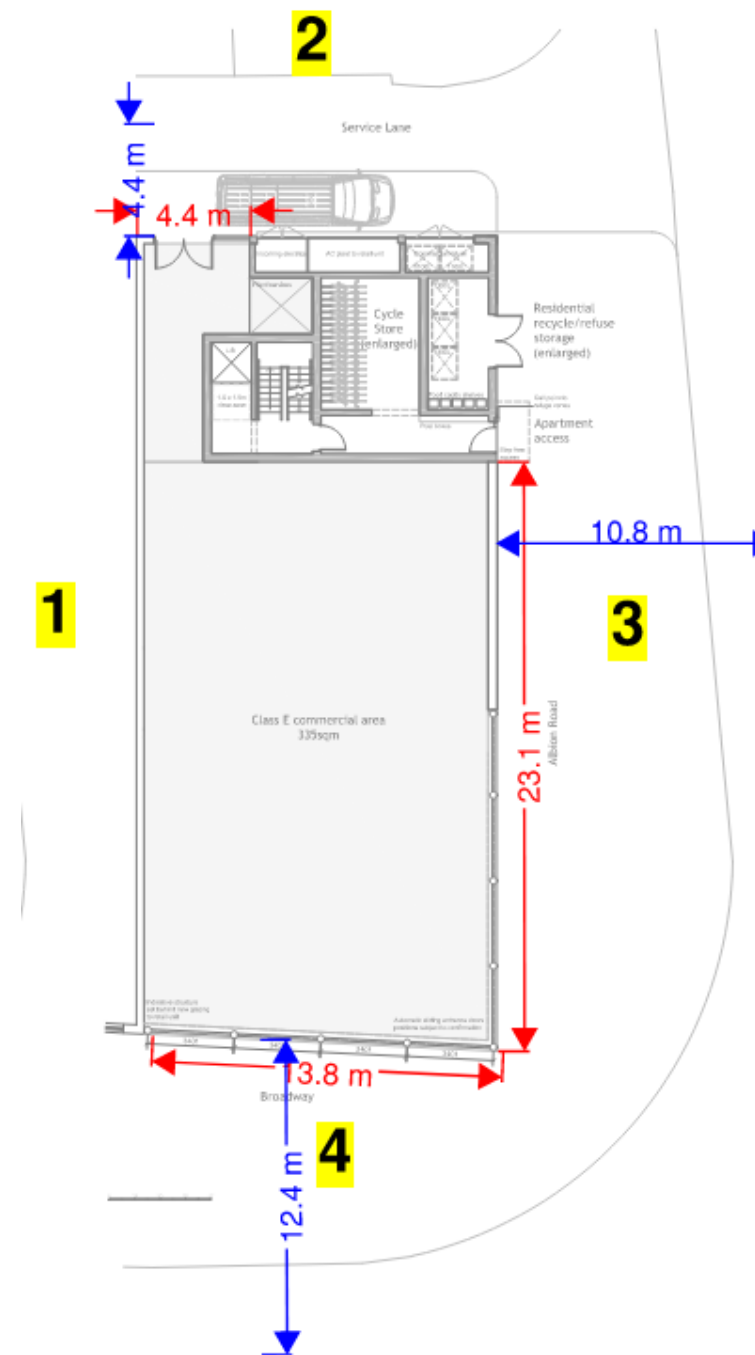


Figure 16 - Relevant boundaries - Ground Floor

Table 15 - Summary of external fire spread assessment.

Elevation	Boundary distance (m)	Enclosing rectangle dimensions (m)		Sprinklers considered	Radiation intensity (kW/m <sup>2</sup> )	Allowable unprotected area
		W	H			
Ground						
1*	<1.0	---	---	Yes	168	0%
2	4.4	4.4	3.3	Yes	168	100%
3	10.8	23.1	3.3	Yes	168	100%
4	12.4	13.8	3.3	Yes	168	100%
Upper						
5*	---	---	---	Yes	84	0%
6	4.2	6.9	3.4	Yes	84	100%
7	4.4	5.9	3.4	Yes	84	100%
8	10.8	14.1	3.4	Yes	84	100%
9	12.4	6.7	3.4	Yes	84	100%

\*Relevant boundary is within 1 m, allowable unprotected area is 0%. As detailed in Section 5.3.4.

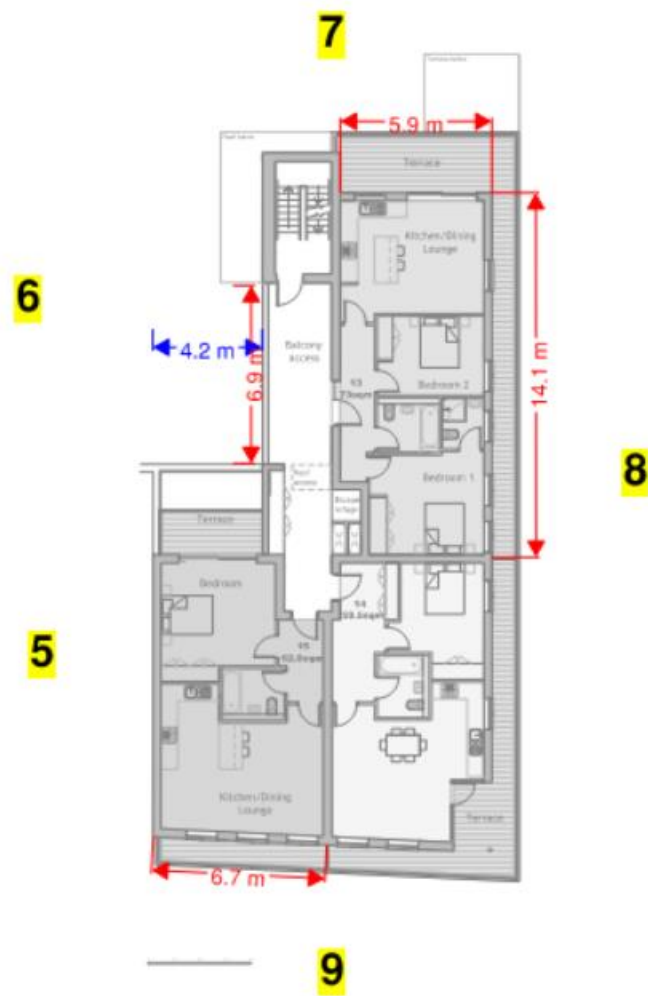


Figure 17 - Relevant boundaries - Upper Floor

## 6. ACCESS AND FACILITIES FOR THE FIRE AND RESCUE SERVICE

### 6.1 Means of notifying the fire and rescue service

6.1.1 In the event of fire, the fire and rescue service (FRS) will be notified by a resident of the building or by a member of the general public.

### 6.2 Vehicle access to and around the site

6.2.1 Vehicle access to the site is provided via Albion Road to the west and a Service Lane to the south which is accessed off Albion Road.

6.2.2 Fire and rescue service (FRS) vehicle access should be within 18m and within clear sight of the dry riser inlet, measured on a route suitable for laying hose. Indicative fire service access routes are illustrated in Figure 18 below.

6.2.3 The dry-riser main outlets should be located within the protected stairway on the full landing at each level, including Ground Floor Level. All areas of the upper levels should be accessible to within 45m of the fire main outlet position, measured along a suitable route for laying hose. The dry-riser main will be designed and installed in accordance with BS 9990 [37].

6.2.4 Any point at Ground Floor Level should be within 45m of the FRS vehicle parking position.

6.2.5 In accordance with BS 9990, a horizontal pipe run of 18m is permitted to where the pipe meets its vertical position within the protected stair.

6.2.6 FRS vehicle appliances should not reverse more than 20m, otherwise, suitable turning facilities will be provided.

6.2.7 The access route requirements provided in Table 16 are for a pump-type appliance taken from London Fire Brigade Guidance Note 29 [38]. FRS vehicles are not standardised, therefore vehicle access provision should be discussed and agreed with the local FRS to ensure their vehicle complies with the parameters listed in Table 16.

Table 16 - Typical pump-type firefighting appliance access requirements

Minimum access route specification	Dimension
Width between kerbs	3.7 m
Width between gateways	3.1 m
Turning circle between kerbs	16.8 m
Turning circle between walls	19.2 m
Clearance height	3.7 m
Carrying capacity	14 tonnes

### 6.3 Access into and through the building

6.3.1 Fire service access is provided to the residential areas via a dedicated passageway at Ground Floor Level which leads to the protected stair and evacuation lift. This access route is to remain a fire sterile area that is constructed to achieve the same level of fire resistance as the stair it serves. The maximum travel distance permitted in the exit passageway is 18m.

6.3.2 Access to any point on the floor plate at Ground Floor Level should be no more than 45m distance, measured on a route suitable for laying hose, from the FRS vehicle parking position.

6.3.3 All doors giving access to the interior of the building should have a minimum width of 850mm.

### Commercial Unit

6.3.4 The commercial unit is independently accessed via external perimeter doors and all areas should be accessible within 45m of the parked vehicle appliance.

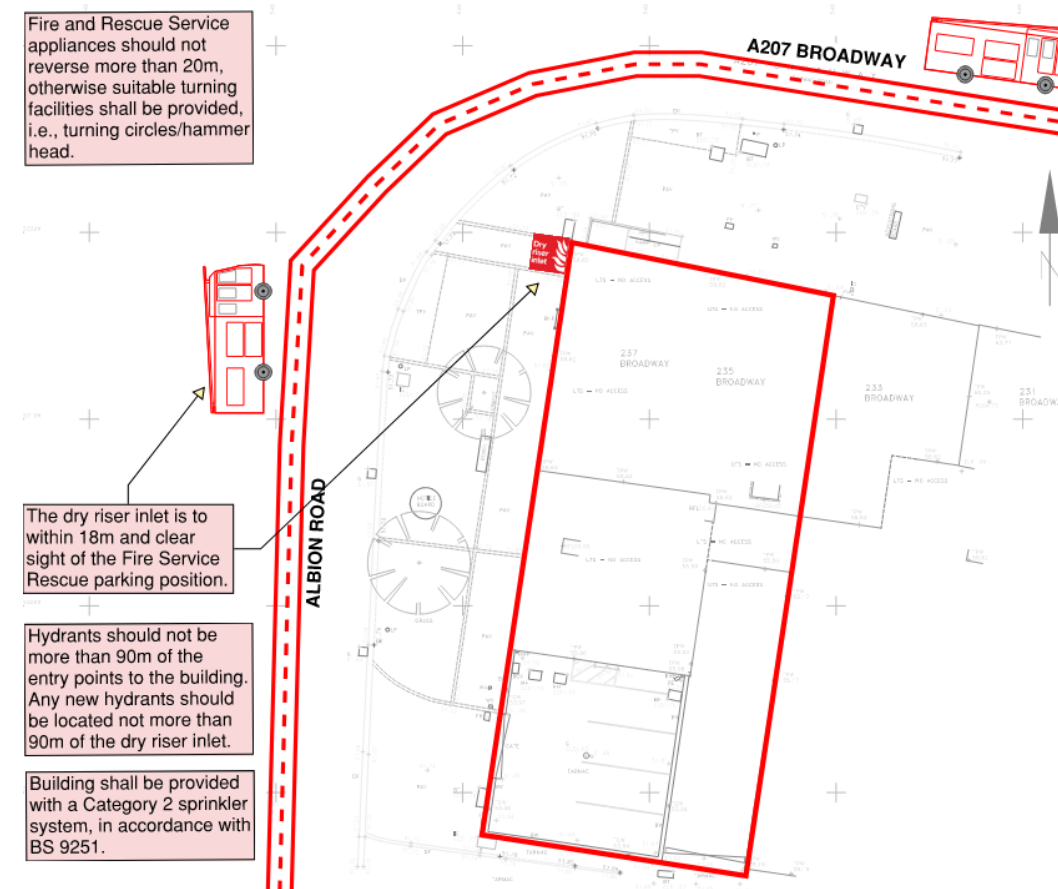


Figure 18 - Indicative firefighting access routes

### 6.4 Water supplies

6.4.1 Hydrants will be required in the vicinity of the buildings to support firefighting operations. As per BS 9991 recommendations, hydrants are to be provided such that there is a hydrant located no more than 90 m from an entry point to each building and from the dry fire main inlet, measured on a route suitable for laying hose.

6.4.2 The location and operational status of existing hydrants should be confirmed by the design team. Additional hydrants will be required if both of the following apply to the building:

- It has a compartment with an area of more than 280m<sup>2</sup>; and
- It is being erected more than 100m<sup>2</sup> from an existing hydrant

6.4.3 Private hydrants should be designed and installed in accordance with BS 9990. All hydrants should have signage in accordance with BS 3251.

6.4.4 If fire hydrants are to be installed, they should be included as part of a ring fire main system. They should be sited immediately adjacent to roadways or hard-standing facilities suitable for fire and rescue service appliances. To ensure that they remain usable during a fire they should be sited with

consideration of the effect that falling debris and other possible occurrences during a fire might have on the continuing viability of the location and should be not less than 6m from a building.

- 6.4.5 A water supply capable of providing a minimum of 1,500 litres per minute at all times is recommended. Water supplies will be designed and installed in accordance with BS 9990.

## 6.5 Fire-aid firefighting

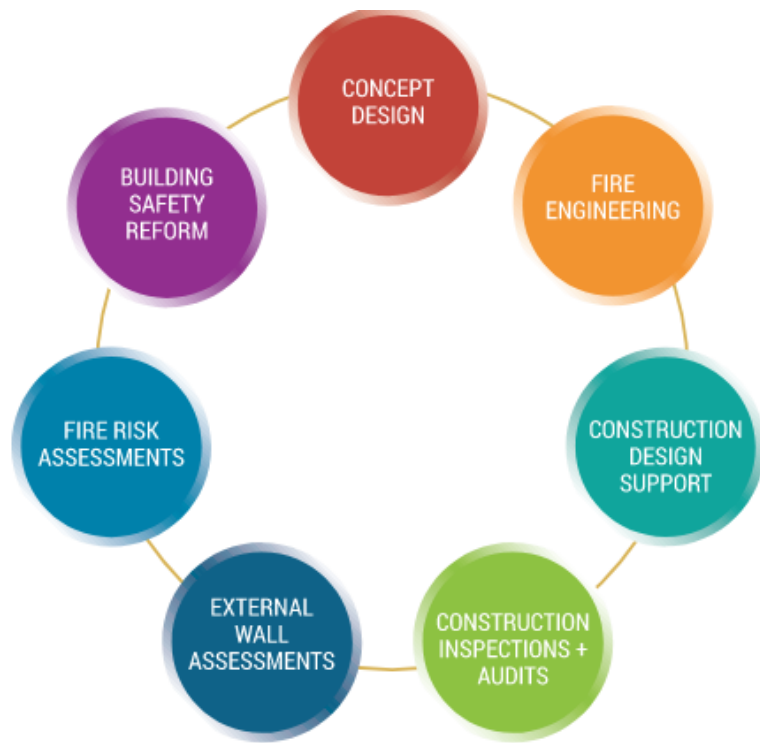
- 6.5.1 First-aid firefighting provisions should be assessed and provided as part of the fire risk assessment for the building, including consideration for the day-to-day management of these provisions.
- 6.5.2 In general, fire points should be located within the ancillary areas presenting a significant fire risk and to ensure coverage of at least one fire point for every 200m<sup>2</sup> of floor area. The type and size of the extinguisher(s) at each point should be chosen in accordance with the guidance given in BS 5306.



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