

# City House – Sutton Park Road

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**RIBA Stage 3 Fire Strategy Report**

**Macar Living (City House) Ltd.**

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<b>Project title</b>	City House – Sutton Park Road	<b>Job Number</b>
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## Executive Summary

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This document presents the RIBA Stage 3 Fire Strategy Report for the proposed development of City House, Sutton Park Road, SM1 2AE.

The proposed building is a mixed-use development comprising a ground and 12 upper floors. The ground floor consists of residential entrance, plant and cycle and refuse storage rooms. There is a commercial unit provided at ground floor which will be provided with separate entrance / exit points and will not share means of egress with the residential areas. The height of the topmost occupied storey is 39.3m above ground level.

The key aspects of this fire strategy include:

- The fire strategy is designed in accordance with BS 9991: 2015. This strategy has also been designed in accordance with policies D12 and D5 of the London Plan 2021.
- Elements of structure are to be provided with 120 minutes of fire resistance.
- A residential sprinkler system will be provided in accordance with BS 9251: 2021
  - The system category will be Category 4
  - The sprinkler system will be extended to provide coverage to the ancillary spaces and ground floor commercial unit. These spaces will be designed with compartment walls to limit the maximum area of a single compartment to not more than 100m<sup>2</sup>.
- Residential apartments will be designed based on a protected internal hallway to which all habitable rooms are accessed from and from which the travel distance will be limited to 9 m.
- Residential apartments will be provided with a grade D, Category LD3 fire detection system to BS 5839-6.
- An evacuation alert system in accordance with BS 8629 will be provided.
- Common areas of the building will be provided with a category L5 fire detection system to BS 5839-1.
- The commercial unit will be provided with category L3 fire detection to BS 5839-1.
- Two escape staircases will be provided to the building:
  - Stair 1 will be an escape and fire-fighting stair. This staircase shall be provided with two entrances which are both accessed by protected corridors provided with smoke ventilation.
  - Stair 2 will be an escape staircase. This staircase will be accessed from a protected residential access corridor which will be provided with smoke ventilation.
- Two lifts are to be provided:
  - Lift 1 will be designed as a fire-fighting lift to BS EN 81-72. The lift will also be designed such that it may be operated for evacuation by occupants prior to the arrival of the fire service on-site.
  - Lift 2 will be an evacuation capable lift that is provided with suitable secondary power supply to provide a means of escape for mobility impaired occupants.
- Stair 1 will be designed as a fire-fighting stair with the following features:
  - 120 minutes fire resistance to the staircase and lift shaft
  - Maximum distance of 7.5m between the lift landing doors and stair access door.
  - Dry rising fire main to BS 9990 with landing valves within the stair core

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# 1.0

## Introduction

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## 1.0 Introduction

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Macar Living (City House) Ltd. has commissioned Cundall to prepare a fire safety strategy report for City House, Sutton Park Road, SM1 2AE.

### 1.1 Objective of the report and assumptions

The objective of this report is to:

- Demonstrate to the statutory authorities how the relevant fire safety requirements of the Building Regulations will be satisfied;
- Provide advice to the design team/contractor to ensure that they can incorporate any fire safety requirements in to the aspects of the design they are responsible for;
- Provide relevant fire safety information to assist those responsible for the management of the building and the safety of the occupants.

For the purposes of this strategy, it has been assumed that fire is an accidental event and that there is a single seat of fire. No account is taken of the potential for arson, which may typically be characterised by multiple seats of fire and the use of accelerants. However, it should be recognised that a number of the fire safety measures provided will also help to reduce the risk and consequences of arson, e.g. compartmentation, etc.

There is also no reliance placed on the fire service for rescue from the building; the assumption being that people should be able to escape from the building using their own unaided efforts.

The dimensions given for the escape routes in this strategy are the minimum required for the stated population. Wider doors and corridors may be required to satisfy other legislation, such as Part M of Schedule 1 to the Building Regulations, or for functional reasons. Therefore, wider doors etc., will be able to accommodate larger numbers of people.

It has been assumed that all building work carried out in accordance with Regulation 7 of the Building Regulations. Therefore, to ensure that the proposed fire safety system detailed within this report achieve the appropriate fire performance, it is recommended that all products, components, materials or structures relating to the fire strategy are installed using competent companies/persons and, where applicable, third party accreditation/certification.

Additional measures may be required for the purpose of property protection and business continuity, which are outside the scope of the Building Regulations. We do not expect there to be any additional measures required, however, it is recommended that the Client and their insurers are also consulted together with any other relevant parties. This fire strategy also does not address any environmental effects resulting from a fire within the building.

### 1.2 Building description

City house is a proposed new-build mixed use development comprising a residential tower block with limited commercial unit located at ground floor level. The development is located on the junction of Sutton Park Road and Cheam Road.

The building comprises a ground plus 12 upper floors containing a total of 70 residential apartments. The ground floor contains various plant rooms, refuse stores and cycles stores and an independent commercial unit. At fifth floor level there is an open roof garden forming a communal amenity space for residents.

There is a small area of below-ground floor comprising an attenuation tank only.

The upper floors are served by two staircases and two lift cores which are located centrally in the common corridor. Apartments are accessed via common corridors with all apartments being single-storey units.

The height of the topmost occupied storey of the building is 39.3m above ground level.



Figure 1-1111: Site Plan

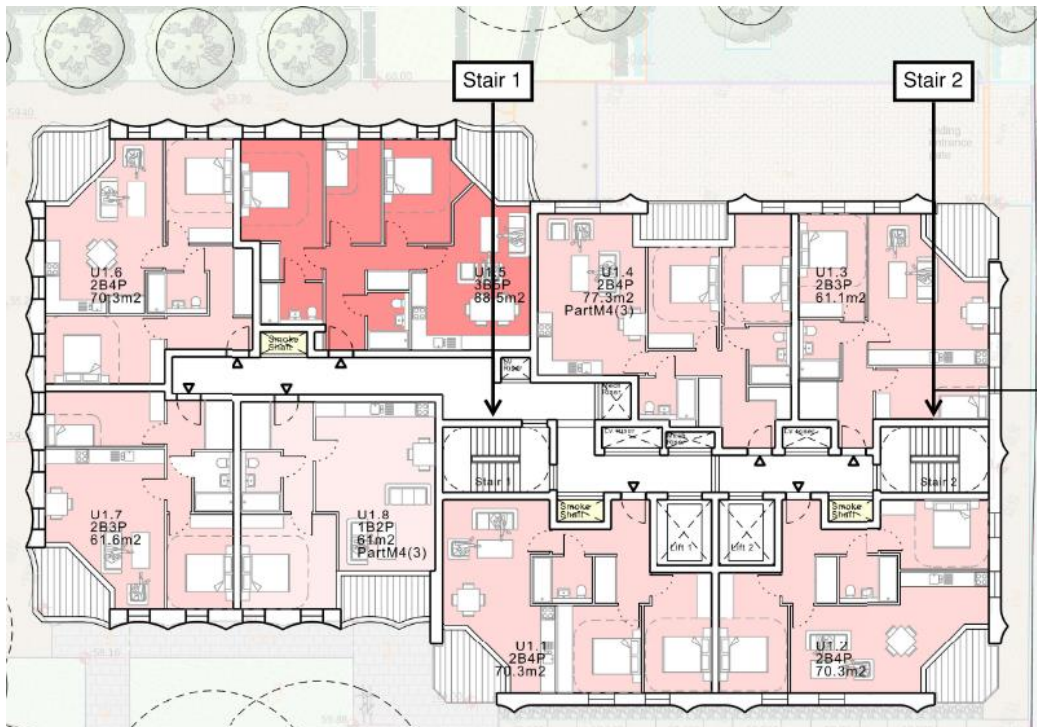


Figure 1-2222: Typical Floor Plan

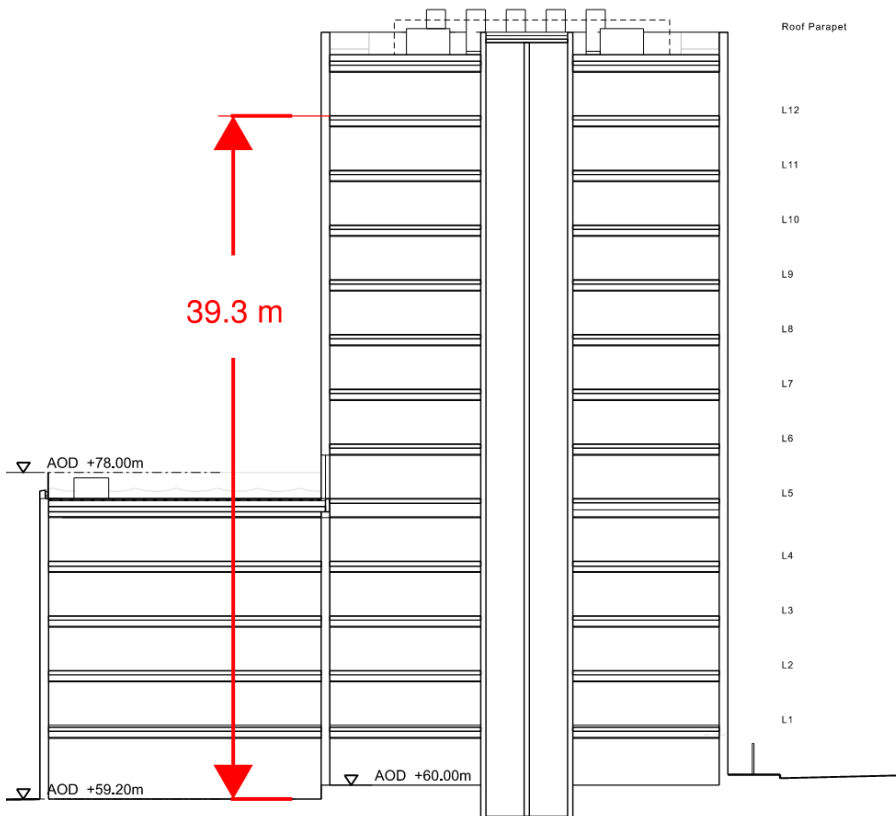


Figure 1-3333: Building Section showing height of topmost occupied storey

### 1.3 Drawings and documents

This report should be read in conjunction with the following architectural drawings which have been provided to Cundall to develop this fire strategy report using.

Table 1-1111 - Drawing List

Author	Number	Name	Date
Wimshurst Pelleriti	WP-0816-A-0151-P-GF	Ground Floor Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0170-P-BL	Basement Plan Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0171-P-GF	Ground Floor Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0172-P-Low	Typical Low Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0173-P-L4	Level 4 Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0174-P-L5	Level 5 proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0175-P-High	Typical High Floor Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0155-P-High	Roof Plan Proposed Schematic Plan	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0202-E-N	North Elevation proposed	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0203-E-S	South Elevation Proposed	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0204-E-E	East Elevation Proposed	30/11/2023
Wimshurst Pelleriti	WP-0816-A-0351-S-AA	Section AA Proposed Schematic Section	30/11/2023



# 2.0

## Applicable legislation and guidance

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## 2.0 Applicable legislation and guidance

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### 2.1 Legislation

#### 2.1.1 Building Safety Act 2022

In response to the Dame Judith Hackett review, the Building Safety Act 2022 has been enacted to incorporate many of the recommendations of the review and to establish a new regime to the approach to Higher Risk Buildings (HRBs) in England.

The Act establishes the role of the Building Safety regulator and their function in relations to buildings, who are now the statutory Building Control Authority in relation to Higher Risk Buildings and are responsible for maintaining registers of building control approvers and building inspectors.

The Act further creates a new regime for the ongoing management of fire safety for the Accountable Person of HRBs and provides enhanced provisions for the residents of HRBs to raise safety concerns to the Accountable Person and for repair and remediation to be made.

The Act defines HRBs as a building in England which:

- Is at least:
  - 18 metres in height (measured to the topmost occupied storey) OR;
  - Has at least 7 storeys
- Contains at least 2 residential units.

As the proposed development meets the above qualification, the building is considered a HRB.

##### 2.1.1.1 Planning Gateway 1

As part of the Building Safety Act's regime and a desire to maintain the "Golden Thread" of information, planning applications involving relevant buildings (defined in the same manner as a HRB above) should be submitted alongside a fire statement which will outline:

- The principles, concepts and approach relating to fire safety that have been applied to each building in the development.
- The site layout.
- Emergency vehicle access and water supplies for firefighting purposes.
- What, if any, consultation has been undertaken on issues relating to the fire safety of the development; and what account has been taken of this.
- How any policies relating to fire safety in relevant local development documents have been taken into account.

This fire strategy report is prepared in support of the Gateway 1 Fire Statement, which shall be provided in document reference: CHS-CDL-XX-XX-R-FE-55201.

#### 2.1.2 Building Regulations 2010

With few exceptions, all buildings built in England and Wales must comply with the England and Wales Building Regulations 2010.

The Building Regulations do not require anything to be done except for the purpose of securing reasonable standards of health and safety for persons in or about buildings, and for the conservation of energy in buildings. They cannot be applied retrospectively and make no recommendations relating to property protection, loss prevention or business continuity.

In England and Wales, the Regulations relating to fire safety are expressed in the form of six functional requirements, these being:

- Requirement B1 Means of warning and escape;
- Requirement B2 Internal fire spread (linings);
- Requirement B3 Internal fire spread (structure);
- Requirement B4 External fire spread;
- Requirement B5 Access and facilities for the fire service; and
- Regulation 38 Fire safety information.

### 2.1.3 Regulatory Reform (Fire Safety) Order 2005

All existing fire safety legislation, except that relating to the Building Regulations, has been gathered together under a single Order. This Order encompasses the previous requirements made under the Fire Precautions Act 1971 and the Fire Precautions (Workplace) Regulations 1997 and extends them to include a requirement to take precautions to safeguard other persons who may be affected by a fire in a building. This legislation is based on a risk-appropriate compliance and requires a fire risk assessment to be carried out once the building has been occupied.

This strategy document may be used as the basis for the fire risk assessment.

### 2.1.4 Construction (Design and Management) Regulations 2015

Projects undertaken in Great Britain and Northern Ireland are subject to the requirements of the Construction (Design and Management) Regulations 2015 (CDM). The objective of CDM Regulations is to reduce risk to health and safety during construction and maintenance of construction sites and occupied buildings.

To fulfil their duties under the CDM Regulations, the contractor should ensure, so far as reasonably practicable, the early installation and operation of fire protection measures contained within this report and any others required as part of the Contractor's construction phase fire safety plan.

Where any conclusions or recommendations, contained in this report, may result in significant or unusual risks during the construction, operation, maintenance or refurbishment of the proposed building, these will have been assessed in accordance with CDM Regulations 11 and 18 (duties for designers) and will be captured in the project risk register.

### 2.1.5 London Plan 2021

The London Plan 2021 is the spatial development strategy for Greater London which sets out the framework for how London will develop as a city. This is a statutory development plan for London which will inform decisions on planning applications across the Greater London Area and will apply to all development proposals. In relation to fire safety, Policy D12 of the London Plan sets out the strategic provisions that are expected of development proposals.

Additionally, Policy D5, part B5 regarding inclusive design influences the evacuation considerations within this strategy by requiring safe and dignified evacuation provisions for mobility impaired occupants.

As this project comprises a major development proposal, it is to follow the requirements of Policy D12b, which requires a Fire Statement, which is an independent fire strategy which should detail how a development will function in terms of:

- The building's construction: methods, products and materials used, including manufacturers' details
- The means of escape for all building users: suitably designed stair cores, escape for building users who are disabled or require level access, and associated evacuation strategy approach
- Features which reduce the risk to life: fire alarm systems, passive and active fire safety measures and associated management and maintenance plans
- Access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and positioning of equipment, firefighting lifts, stairs and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these

- How provision will be made within the curtilage of the site to enable fire appliances to gain access to the building
- Ensuring that any potential future modifications to the building will take into account and not compromise the base build fire safety/protection measures.

This report may form the basis of the Fire Statement.

## 2.2 Design guidance

The guidance presented in this report has been based on the recommendations of BS 9991:2015: *Fire Safety in the design management and use of residential buildings – Code of practice* and the associated British and European Standards (BS and EN respectively).

The recommendations of BS 9991 are based largely on fire engineering principles and allow a greater degree of flexibility in the design when compared to other standards, such as Approved Document B: *Fire safety*. Using this approach will result in a more efficient and cost-effective design, without compromising on fire safety.

As with all British Standard Codes of Practice, BS 9991 provides guidance and recommendations relating to its subject matter. It does not contain mandatory clauses or prescriptive requirements, and it is acceptable to develop alternative solutions from the recommendations made, provided such alternative designs are supported by adequate evidence that the functional requirements of the Building Regulations will be met, and other aspects of BS 9991 are not compromised.

The Standard also acknowledges that in some circumstances it may be necessary to use one guidance document to supplement another and confirms that this is acceptable provided the overall approach is fully integrated into the final design solution.

Where an alternative approach has been taken, this is highlighted in the relevant section of the report, along with the necessary information to demonstrate compliance with the relevant requirements.

# 3.0

## Fire safety systems

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## 3.0 Fire safety systems

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### 3.1 Fire detection and alarm systems

The building will be provided with automatic fire detection systems designed in accordance with the BS 5839-1 and BS 5839-6. The details of the proposed system are summarised below.

It is expected that the relevant designers and installers will develop the design of the system and will be responsible for providing the necessary certification and obtaining the necessary approvals. Where a variation is required to the recommendations of BS 5839-1, these will be identified and agreed with all relevant parties to ensure that the objectives of this fire strategy are satisfied.

#### 3.1.1 Category of system and coverage

##### 3.1.1.1 Apartments

Each apartment will be provided with a standalone system designed in accordance with BS 5839-6. The system will be a Grade D, Category LD3 system. This requires detectors to be located within the circulation space serving as the escape route from an apartment (i.e. the apartment entrance hallway).

##### 3.1.1.2 Common areas serving apartments

A Category L5 system designed in accordance with BS 5839-1 will be provided in the common areas of the building. This is provided only to operate the fire safety systems in the common areas. This will include:

- Smoke ventilation systems;
- Automatic hold open devices to doors;
- Any HVAC systems serving the common areas;
- Electronic access control systems will release where located on egress routes.
- Notification signal to be sent to ground floor commercial / office unit fire alarm panel.

##### 3.1.1.3 Ancillary spaces

Ancillary spaces within the residential areas of the building will be provided with a Category L5 alarm system. Automatic fire detection is to be provided to all ancillary rooms such as cycle stores, plant rooms, etc. which will initiate an audible alarm within the affected room only to alert occupants within the room or who attempt to enter the room of the presence of fire.

##### 3.1.1.4 Commercial Unit

In accordance with BS 5839-1, the minimum recommended category of alarm system for office type accommodation to satisfy legislative requirements is a category M system comprising manual call points only, however it is recommended that automatic fire detection is also provided to this area of the building to improve the safety provisions to occupants of the unit and enable automatic activation of any fire safety systems.

A minimum category L3 alarm system in accordance with BS 5839-1 is recommended, which will comprise automatic detection within all escape routes and rooms which open onto escape routes. It is expected that the requirements for additional detectors or a higher standard of coverage will be assessed during fit out works to the commercial unit by those responsible for the alarm design.

### 3.1.2 Audible and visual alarms

#### 3.1.2.1 Apartments

The alarm signal will be distinct from any other alarms or signals used and the audibility of the alarm signal will not be less than 75 dB(A) at the bedhead within the apartments. Elsewhere within an apartment, the audibility will be not less than 65 dB(A), although this may be reduced to 60 dB(A) in enclosures of no more than 60 m<sup>2</sup> in area. Where the background noise is greater than 60 dB(A), the sound pressure level of the alarm signal will be 5 dB above this level, but not greater than 120 dB(A).

In addition to audible alarms, visual alarms satisfying the recommendations of BS 5839-1 will be provided in areas where it is anticipated that persons with impaired hearing may be located in relative isolation.

Rooftop plant areas will be provided with both audible and visual alarms as required.

#### 3.1.2.2 Ancillary Rooms / Commercial unit

The alarm signal will be distinct from any other alarms or signals used and the audibility of the alarm signal will not be less than 65 dB(A) throughout all accessible areas of the building, although this may be reduced to 60 dB(A) in enclosures of no more than 60 m<sup>2</sup> in area. Where the background noise is greater than 60 dB(A), the sound pressure level of the alarm signal will be 5 dB above this level, but not greater than 120 dB(A).

#### 3.1.2.3 Common areas serving apartments

No audible alarm will sound within the common areas due to the evacuation arrangements. The system is only provided to operate the fire safety systems.

The exception to the above is on the fifth floor where a communal roof garden is provided. On this floor, the L5 fire detection system is to be provided with beacons and sounders on the roof garden area to alert occupants of this space to the presence of smoke in the common corridor on the fifth floor.

### 3.1.3 Connection to other systems

Any systems that are designed to operate automatically in the event of a fire, provide an input to the fire alarm panel, or are required to shut down will be connected to the fire alarm system. Such systems will include:

- Smoke ventilation systems;
- The automatic sprinkler systems;
- Automatic hold open devices to fire doors;
- HVAC systems, e.g. closing of dampers, shutting down of fans;
- Shut off valves to gas systems;
- Electronic access control systems will release where located on egress routes;
- The residential L5 alarm system and commercial L3 system will be linked so that notification is received on the fire alarm panel for each system.
- Remote alarm receiving centre if provided

#### 3.1.4 Cause and effect

A full fire alarm cause and effects matrix for the fire alarm system will be created by those responsible for the design of the fire alarm system. This will be produced during the design stage of the system and agreed with the building management, and relevant authorities, prior to commissioning and handover.

The matrix will include the evacuation arrangements detailed in Section 4 of this report and all devices and systems connected to the fire alarm system and describe how the system is designed to operate. This will then be used as part of

the commissioning process and any future fire alarm testing and maintenance. Any changes and modifications to the system will require the fire alarm cause and effects matrix to be updated accordingly.

### **3.1.5 Evacuation Alert System**

An evacuation alert system in accordance with BS 8629 will be provided to the residential areas of the building to assist the attending fire service with managing a wider evacuation of the building if necessary.

Evacuation alert sounders will be provided within the entrance hallway of each apartment.

Control and indicating equipment for the evacuation alert system is to be provided within the building, adjacent to the fire service's entry point.

## **3.2 Sprinkler system**

As the building exceeds 11m in height, it will be provided with a system of automatic fire suppression.

A residential sprinkler system will be provided in accordance with BS 9251. The system will comprise a category 4 system and will be designed with a minimum supply duration of 60 minutes. Sprinkler heads will be provided within all apartments, ancillary rooms and within common corridors.

In accordance with BS 9251, the system may be extended to provide protection to limited areas of Ordinary Hazard type accommodation (i.e. the ground floor commercial unit). The ground floor commercial unit will be provided with compartmentation (See Section 5.3.2 for further details in relation to compartmentation) to limit the maximum area of a single fire compartment to a maximum of 100m<sup>2</sup> to enable this design. If this is not achieved, it will be necessary to provide the unit with sprinkler coverage to BS EN 12845.

## **3.3 Emergency lighting**

Emergency escape lighting will be designed, installed and maintained in accordance with the appropriate recommendations of BS 5266-1 and BS EN 1838. The system will be self-contained and non-maintained, with a duration not less than 180 minutes.

Emergency luminaires are to be provided to the following areas:

- All internal circulation areas, open plan areas greater than 60 m<sup>2</sup> in area and any windowless accommodation;
- At every storey exit and final exit door;
- External escape routes and external areas in the immediate vicinity of exits;
- In all escape stairs to ensure that, each flight receives direct light. Lighting to escape stairs should be on a separate circuit from that supplying other parts of the system;
- At any changes in floor level and any changes in direction of escape routes;
- Close to (typically within two metres of) all fire safety, or other safety equipment;
- All toilets accommodation greater than 8 m<sup>2</sup> in area; and
- All plant rooms.



### 3.4 Ventilation systems

#### 3.4.1 Smoke ventilation

##### 3.4.1.1 Typical Floors

Apartments are all to be accessed via protected corridors which are provided with a natural vertical smoke shaft in accordance with the recommendations of clause 14.2.3 of BS 9991. The details of the smoke shaft design are as follows:

- The shaft cross-sectional area will be a minimum of 1.5m<sup>2</sup> with minimum dimension of 0.85m
- The shaft will extend at least 2.5m above the ceiling level of the highest storey served by the shaft and 0.5m above any surrounding rooftop elements within 2m of the vent.
- Automatic Opening Vents (AOVs) linked to the corridor L5 fire alarm system are to be provided from the common corridor into the shaft. The minimum free area of the vent will be 1.0m<sup>2</sup>. All AOVs are to be smoke control dampers.
- A 1.0m<sup>2</sup> AOV is to be provided at the head of each staircase.
- The smoke shaft will be constructed from non-combustible materials achieving class A1 to BS EN 13501-1.

The arrangement of smoke ventilation to the upper floors is outlined in Figure 3-1111Figure 3-11 below. The smoke shaft for corridor 1 will terminate at the Level 5 communal roof amenity while the corridor 2 and 3 smoke shafts will terminate at roof level.

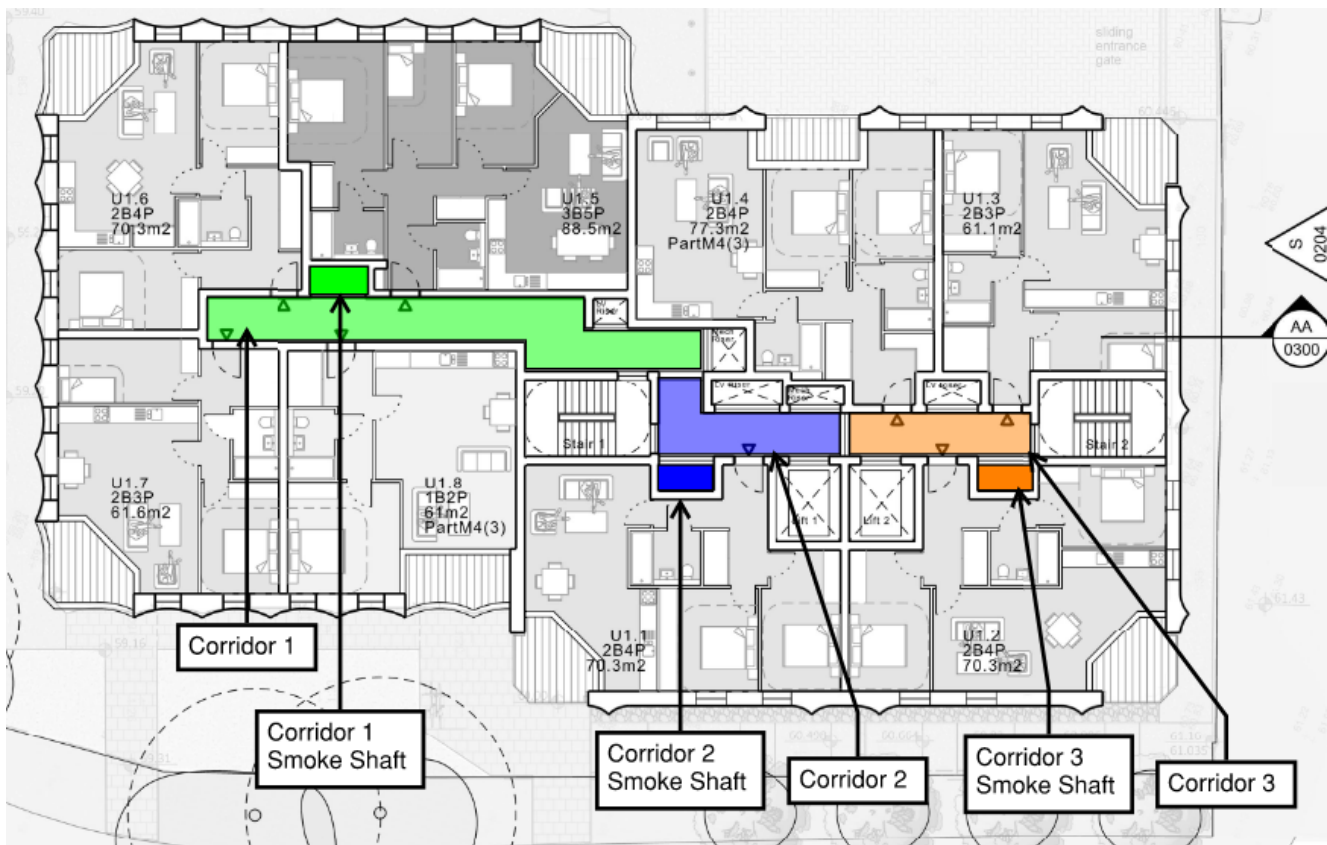


Figure 3-1111: Upper Floor Smoke ventilation arrangements

##### 3.4.1.2 Ground Floor

The ground floor of the building is provided with two sections of corridor which access plant rooms and cycle stores and which adjoin the final exit routes to the protected escape staircases. In accordance with BS 9991, these sections of

corridor are to be provided with smoke ventilation to protect the final exit route from the staircase. The locations of these corridors are outlined in Figure 3-2222Figure 3-22 below.

The smoke ventilation provision to the ancillary corridor accessed from the stair 1 escape route may be provided via a suitable manually operated fire door serving as a vent which is interlinked with the staircase AOV to open the AOV in a fire scenario when the door is operated. In addition to the smoke ventilation required for active fire scenarios, the corridor is to be provided with a minimum of 0.2m<sup>2</sup> of permanent natural ventilation to satisfy BS 9991 recommendations for corridors / lobbies serving refuse storage rooms.

The ancillary corridor adjacent to the residential cycle store 3 and 4 entrances will be provided with smoke ventilation via the vertical smoke shaft serving the upper floor corridors. This shaft will be continued down to ground floor level with a ceiling mounted AOV to ventilate the access lobby to the cycle stores.

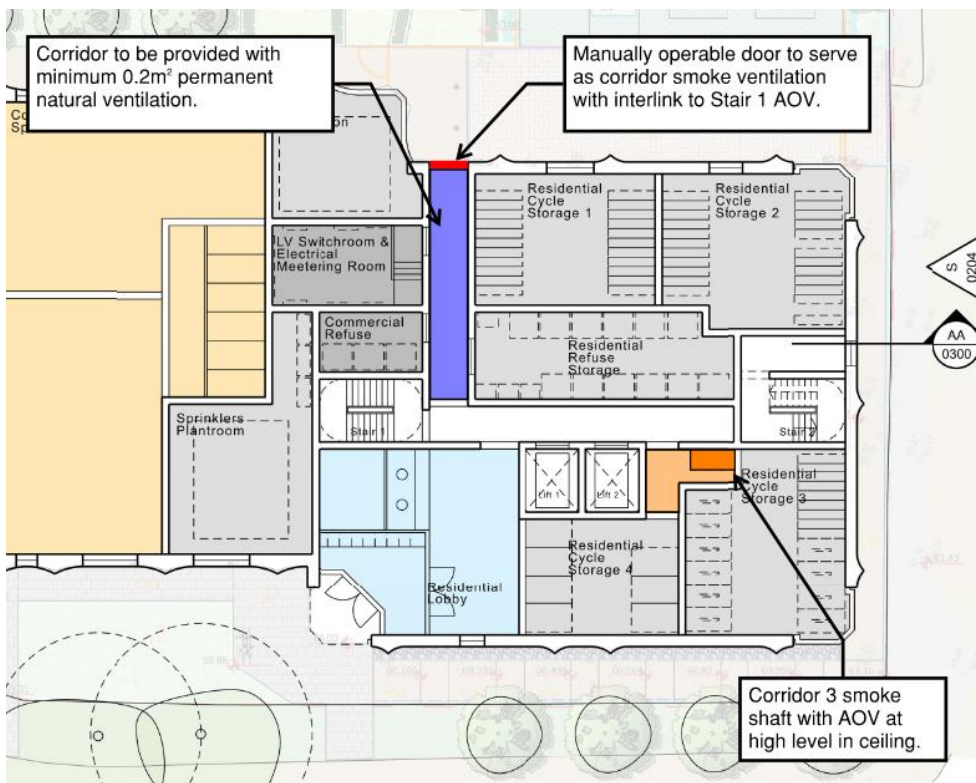


Figure 3-2222: Ground floor smoke ventilation arrangements

### 3.4.2 Heating, ventilation and air conditioning systems (HVAC)

Ductwork will be designed in accordance with the recommendations of BS 9991 and BS 9999. Where non-fire resisting ductwork passes through fire resisting construction, fire dampers are to be provided within the thickness of the construction. Where the ductwork passes through a protected escape route, these dampers are to be motorised fire and smoke rated dampers interlinked with the alarm system.

Ductwork serving protected escape staircases and fire-fighting shafts should not serve other areas of the building and where ductwork no serving the stair passes through the enclosure, the ductwork should be fire resisting ductwork.

Where an area of the building is part of a fire-fighting shaft, ductwork that is not associated with the fire-fighting shaft should not pass through this area.

Where practicable air transfer grilles should avoid being provided within fire-resisting walls and doors. However, intumescent type grilles may be fitted where the construction does not form a protected escape route. Where the wall or door forms part of a protected escape route, air transfer grilles should be avoided or fire and smoke dampers provided that operate on operation of the fire alarm system.

For the purpose of ductwork design, protected escape routes and fire-fighting shafts are indicated in the below figures.

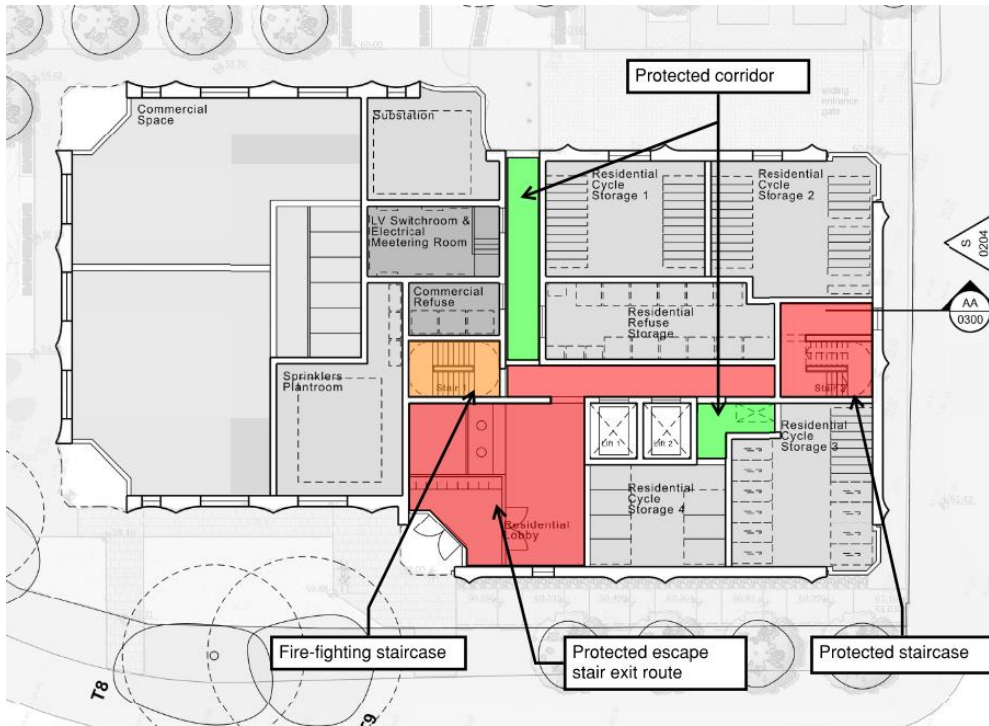


Figure 3-3333: Ground Floor Protected Escape Routes



Figure 3-4444: Upper Floor Protected Escape Routes

### 3.5 Access control systems, door fastenings, and hold-open devices

Where doors are normally secured against entry, they will only be fitted with a lock or fastening, which is readily operated, without the use of a key and without having to manipulate more than one mechanism.

Where electrically powered locks are provided, then they should return to the unlocked position under the following conditions:

- On operation of the fire alarm system;
- On loss of power to the system;
- On system error;
- On activation of a manual door release unit positioned on the side of the door approached by occupants making their escape.

Where hold-open devices are provided to fire doors, these will release the door automatically on operation of the fire alarm system, following the agreed cause and effect. In addition, the door hold-open device will release the door on failure of the power supply. Door hold-open devices will be in accordance with the relevant requirements of BS EN 1155.

### 3.6 Vertical transportation

#### 3.6.1 Evacuation lifts

To comply with Policy D5(B5) of the London Plan, each stair core which is provided with at least one lift is to be provided with an evacuation lift to enable a safe and dignified method of evacuation for mobility-impaired occupants.

Current available design guidance for evacuation lifts relies on suitably trained and qualified members of staff to be present to operate evacuation lifts and that control of evacuation lifts during a fire scenario is performed by trained staff using override controls. This is not typically available within residential developments which are not provided with permanent 24-hour concierge facilities. Draft standard prEN 81-76, with outlines alternative modes of operation for evacuation lifts, is currently under review and due for publication at a later date, however at present it is not possible to certify an evacuation lift without operation by trained members of staff.

It is proposed that fire-fighting lifts and passenger lifts will be designed as “evacuation capable” lifts for the purposes of satisfying Policy D5(B5).

- On activation of the fire detection and alarm system, fire-fighting lifts and passenger lifts will remain in normal operation to provide a means of mobility impaired occupants to self-evacuate from the building.
  - Fire-fighting lifts will be provided with override controls at fire and rescue service access level which will enable the fire and rescue service to assume control of operation of the fire-fighting lift and disable on-floor controls from the residential floors. Passenger lifts will remain in operation to continue to provide evacuation capability.
- The lift controls will be programmed to prioritise calls from floors where the common fire detection system has been activated.
- Evacuation-capable passenger lifts will be designed and installed in accordance with relevant guidance from Annex G of BS 9999 and BS EN 81-20 and BS EN 81-70 in relation to lift car dimensions, fire protection to the lift shaft, secondary power supplies, etc.

This approach is to be agreed with relevant authorities having jurisdiction including the local fire service.

#### 3.6.2 Fire-fighting lifts

Lift 1 will be designed as a fire-fighting lift. The fire-fighting lifts will be designed and installed in accordance with BS EN 81-20 and BS EN 81-72.

## **3.7 Water supplies for fire-fighting**

### **3.7.1 Hydrants**

There should be sufficient hydrants located near to the building for use by the fire service. The location and suitability of hydrants and the flow rates will need to be determined by the fire service based on their risk assessment.

Typically, where there are existing hydrants within 90 m of the building, there are no additional requirements for the purposes of Building Regulations. If new hydrants are required, then consultation should be undertaken with the fire authority to determine the number and location of hydrants. All new hydrants should be designed and installed in accordance with BS 9990.

### **3.7.2 Fire mains**

Dry rising mains will be provided in accordance with BS 9990. The location and arrangement of the dry rising mains will be in accordance with Section 7.3 of this report.

## **3.8 Emergency power supplies**

Secondary power supplies will be required to all life safety and fire-fighting systems, e.g. fire-fighting lifts, mechanical ventilation systems etc. The secondary power supply should ensure that these critical systems remain active on loss of normal power service to the building. This is normally achieved by an emergency generator, although for some systems with low power requirements a local battery may be sufficient. The arrangement of the power supplies should be in accordance with BS 8519.

Secondary power should be provided to the following systems:

- Fire detection and alarm system
- Smoke ventilation AOV systems
- Fire suppression systems
- Emergency Lighting System
- Evacuation Alert System
- Fire-fighting / Evacuation Capable Lift System

## **3.9 Fire safety signage**

### **3.9.1 Escape Routes**

Every escape route, other than those in ordinary use, will be distinctively and conspicuously marked by emergency exit signage of adequate size. The signage will be consistent throughout the building and will comply with the recommendations of BS 5499-1 and comprise of a graphical symbol, directional arrow and supplementary text.

Consideration needs to be given to any fit-out design and position of furniture, partitions, and fixings that could obscure signage or the escape route. Therefore, this should be reviewed as part of any on-going fire risk assessments once the building is occupied.

All fire safety signs which indicate escape routes shall be illuminated by means natural lighting or artificial lighting. To cater for power failure, emergency lighting will be located to provide sufficient illumination to these signs such that they are clearly distinguishable by occupants.

### **3.9.2 Wayfinding Signage**

Emergency wayfinding signage will be provided within all residential blocks to assist the fire and rescue service in navigating the building.

Floor indicator signs will be provided at each stair landing at a height between 1.7m and 2m from floor level.

Floor indicator signs will be provided within each protected lobby which a fire-fighting lift opens onto in a location immediately visible when the lift landing doors open.

Floor indicator signs will take the form “Floor X” where X designates the number of the storey (where ground level is Floor 0).

Apartment indicator signs will be provided directly below each floor indicator sign taking the form “Flats X-Y” where X is the lowest flat number and Y is the highest on the floor. Supplementary arrows should be used where multiple directions of travel are available from the fire-fighting lobby.

### **3.10 First aid fire-fighting equipment**

Although not a direct requirement for compliance with the Building Regulations, for the purposes of satisfying the requirements under the RRO, portable fire extinguishers should be provided in accordance with BS 5306-8:2012 along with suitable training provided to persons expected to use them. These provisions apply to the ground floor commercial unit and will apply once the premises are occupied.

All equipment should be located so as to be readily available in all areas and strategically located in areas not likely to be involved in the early stages of a fire (adjacent to storey exits or by fire alarm points). Extinguishers should be mounted so that the carrying handle of larger, heavier extinguishers is circa 1,000 mm above the floor, but smaller extinguishers can be mounted so that the handle is circa 1,500 mm from the floor.

It is recommended that advice on the type and location of extinguishers is sought from the manufacturer/supplier and those responsible for the fire risk assessment. Typically, water-based fire extinguishers used for Class A fires are distributed around the building, generally located adjacent to exits and circulation routes. Additional types of fire extinguisher, fire blankets, etc. may be required for other fire types, e.g. oils, electrical, etc. These should be located locally to the associated risk.

# 4.0

## Means of escape

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## 4.0 Means of escape

### 4.1 Evacuation arrangements

Within the residential areas, the evacuation arrangements are based on a defend in place approach, where only the occupants of the apartment of fire origin will be expected to evacuate. Occupants within other residential apartments in the building will not receive an alarm, but if they consider it necessary to evacuate, then fire safety measures have been incorporated into this fire strategy to allow them to do so. Further alarmed evacuation of residential apartments beyond the compartment of fire origin will be performed at the discretion of the attending fire and rescue service via the evacuation alert system and subject to their on-site activities and risk assessment.

The Commercial Unit will be expected to operate a simultaneous evacuation strategy whereby an alarm within the unit will result in a full evacuation of the commercial unit. This will be independent of the residential evacuation strategy and an alarm on one area of the building will not result in an evacuation of the other.

### 4.2 Escape within Apartments

Apartments will be designed in accordance with Figure 14 of BS 9991. All habitable rooms within the apartment are to be accessed via a protected internal entrance hallway that affords 30-minute fire resisting construction and minimum FD30 fire doors to all rooms opening onto the hallway. The maximum travel distance within the apartment entrance hall is to be limited to 9 m. Based on the current architectural plans, these travel distances appear to be achieved.

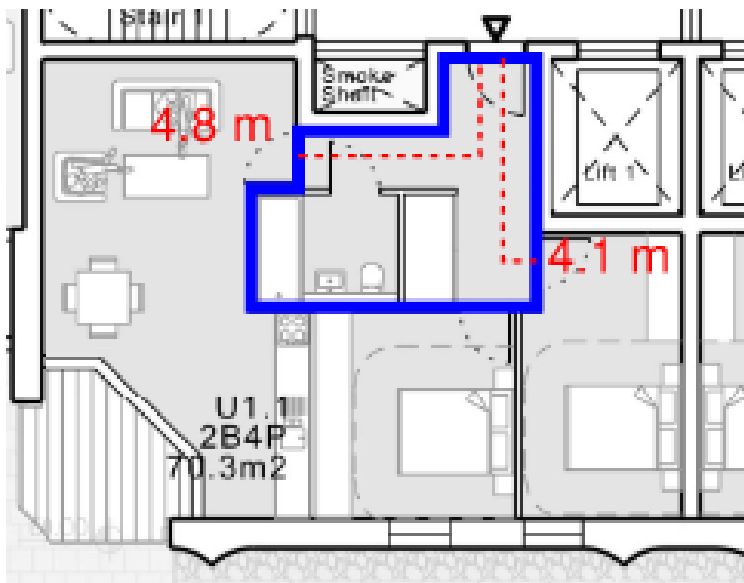


Figure 4-1111: Typical apartment internal block plan protected internal corridor and travel distances

Bathrooms do not need to be separated from the entrance hall by fire doors provided that they are separated by other areas of the apartment by fire resisting construction.

Where apartments are provided with private balconies and the access room to the balcony contains the kitchen facilities, the location of the cooker should be sited as far as practicable from the required means of escape route. A minimum space separation of 1.8 m between cooking appliances and the necessary path of travel to reach the room exit is recommended, with a minimum width of this path of travel of 0.9m.



### 4.3 Escape within Common Areas

#### 4.3.1 Ground floor

At ground floor level each stair will discharge to the external of the building via separate routes. Stair 1 will exit via the main residential entrance lobby while Stair 2 will exit to the south of the building.

The route from the star to the final exit will be afforded with the same level of protection as the staircase, with any ancillary accommodation at ground floor separated from the escape routes via a protected corridor / lobby which is provided with smoke ventilation.

The construction separating the two exit passageways leading to separate final exits should be imperforate (i.e. no openings for doors or ventilation louvres). Therefore, the area indicated in Figure 4-2222Figure 4-22 should be provided with solid EI 120 rated construction to comply with this requirement while also affording access to the fire-fighting lift from the Stair 2 entrance.



Figure 4-2222: Ground floor final exit routes

#### 4.3.2 Lower Floors

The first through to fourth floors follow the principles of Figure 7 a) and b) of BS 9991. Apartments on these floors will have access to two escape staircases. Stair 1 will be provided with two doors which afford access from different protected corridors.

Four apartments to the north side of the building will exit into a smoke-ventilated section of corridor where escape is available in a single direction. This area will be designed in accordance with Figure 7 b) for corridor access with dead-ends and the maximum travel distance in this corridor will not exceed 15m to the staircase entrance door.

The four apartments to the south side of the building exit into a section of common corridor in which two directions of escape are available. The maximum travel distance in this section is not more than 30 m and the arrangement is in accordance with Figure 7 a) of BS 9991.

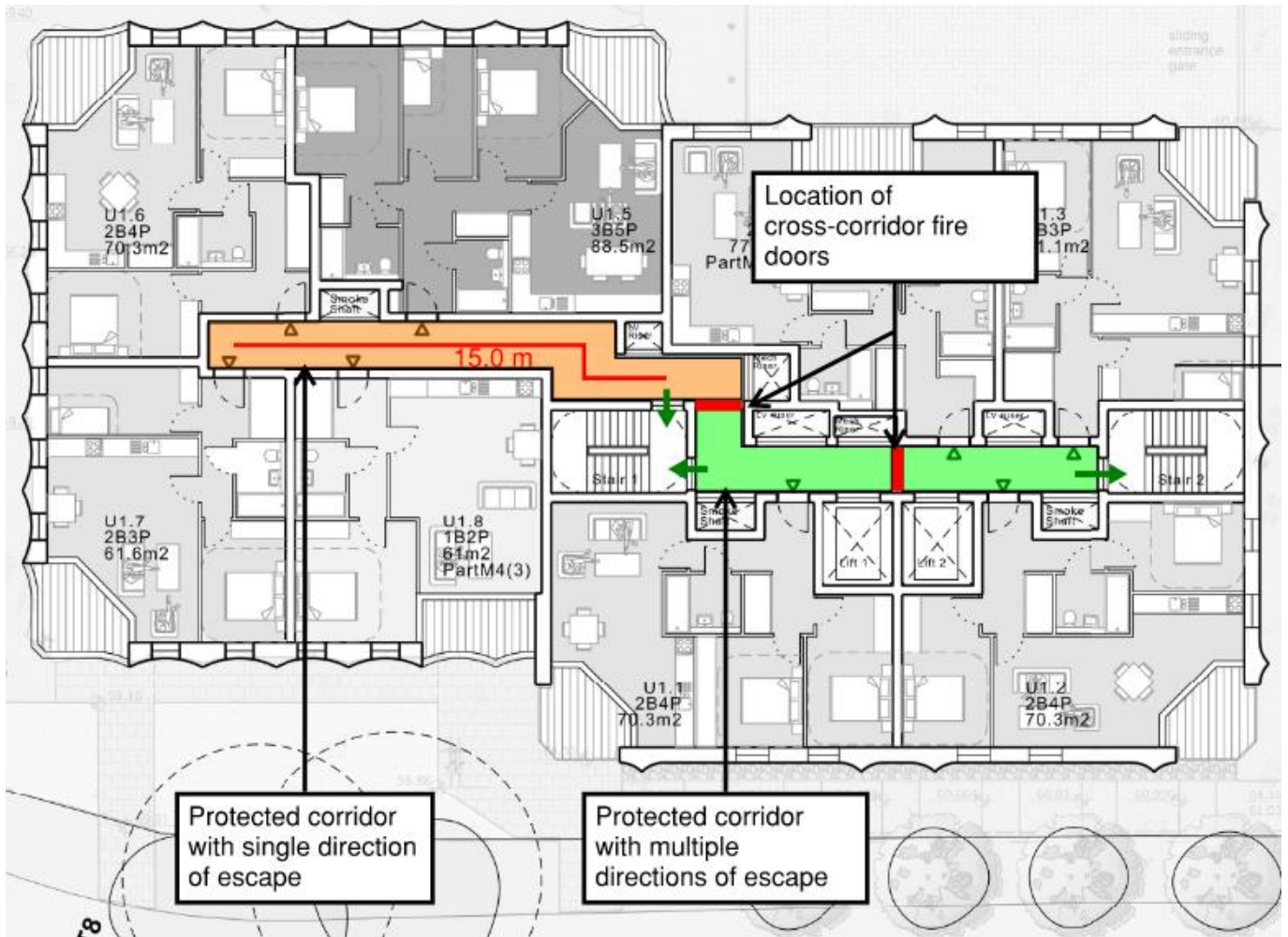


Figure 4-3333: Lower level common escape arrangements

### 4.3.3 Upper Floors

Upper floors will be designed in accordance with Figure 7 a) of BS 9991. Staircases on these floors are accessed by ventilated common corridors and escape is available in two directions in each corridor. Travel distances within the common corridor do not exceed 30 m.

A cross corridor door is to be provided to separate the central corridor into two separate sections.

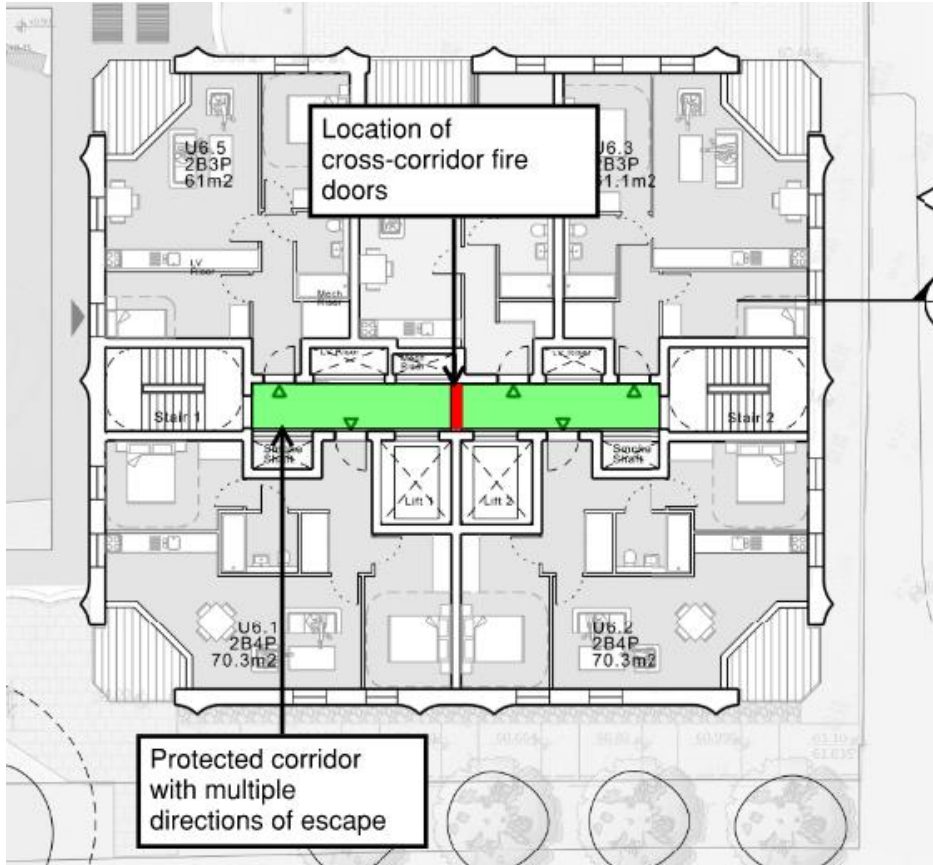


Figure 4-4444: Upper level common escape arrangements

### 4.3.4 Fourth Floor Plant Rooms

A series of plant rooms are provided on the fourth floor which are accessed via a protected lobby from the common corridor. In accordance with BS 9991, this is an acceptable arrangement for buildings which are provided with more than one escape staircase.

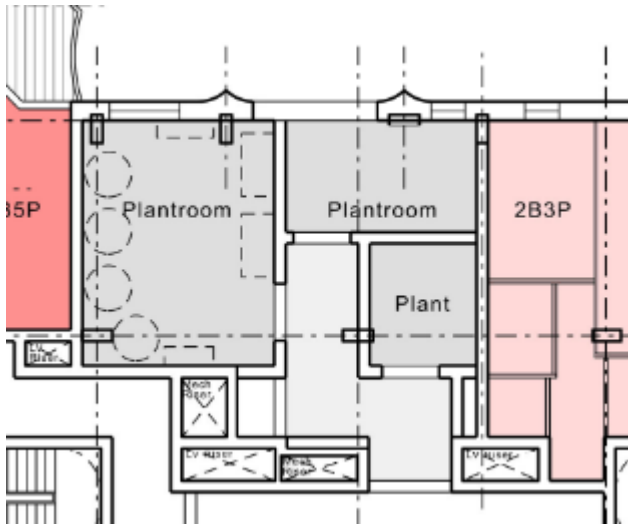


Figure 4-5555: Fourth Floor plant area

### 4.3.5 Fifth Floor Roof Garden

A communal roof garden is provided on the fifth floor. This roof garden is accessed directly from a protected corridor and is open to the external air. Consequently, there is no limit on maximum travel distance on the roof garden.

The roof garden should be provided with alarm sounders and visual beacons which are interlinked with the building common fire alarm system to provide audible warning to occupants in this area for detection of smoke within the fifth floor common corridors.

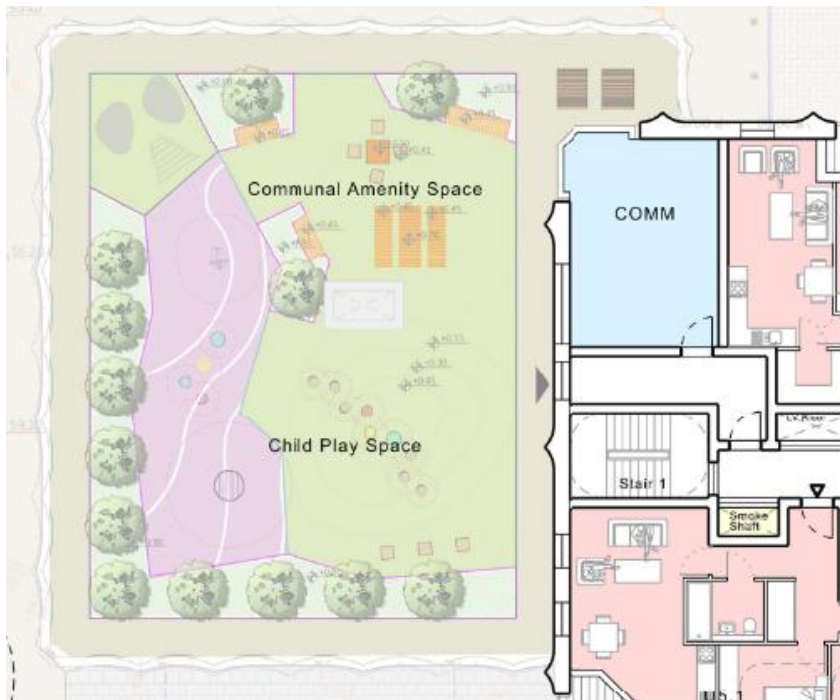


Figure 4-6666: Fifth floor roof garden

## 4.4 Exit and stair widths

### 4.4.1 Doors and corridors

- Corridors should not be less than 1,200 mm.
- For cross-corridor doors, the width of the doors should not be less than the required width of the corridor minus 150 mm.
- For unassisted wheelchair access is required, doors on escape routes should not be less than 850 mm;
- Elsewhere, the absolute minimum width of a door is 800 mm.

### 4.4.2 Stairs

Stair 1 is used as a fire-fighter's access stair in addition to escape purposes and is therefore to afford a minimum clear width of 1,100mm.

Stair 2 is used for escape and may also serve as secondary access to the building. In accordance with BS 9991, a minimum stair tread width of 750 mm is considered sufficient, although this staircase may need to be wider to accommodate other aspects of the building regulations.

For the purposes of escape, the handrails can be discounted when determining the stair width, provided they do not intrude more than 100 mm into the stair width.

## 4.5 Escape from Commercial Unit

The means of escape from the commercial unit will be designed in accordance with BS 9999.

BS 9999 uses the concept of risk profiles when determining the necessary means of escape and fire safety provisions from establishments. For this commercial unit, a risk profile of B3 will be applied, which corresponds to awake but unfamiliar occupants and a *fast* fire growth rate. This risk profile would be the expected risk profile of a supermarket type retail unit.

In accordance with BS 9999, where an occupancy is provided with automatic fire suppression, the benefits this provision offers to the expected fire conditions may be quantified by upgrading the risk profile by one level, therefore the means of escape from the unit will be based on a B2 risk profile.

The occupant load of the unit is assessed based on a floor space factor of 2.0m<sup>2</sup> / person corresponding to a high-density shop such as a clothing store in accordance with Table 9 of BS 9999 (this is selected as a worst-case example). The area of the commercial unit is 243.5m<sup>2</sup> and the predicted occupancy is therefore 122 occupants.

The predicted occupancy of the unit is greater than 60 and less than 600, therefore a minimum of 2 exits from the unit should be provided. The minimum clear width of each exit is to be 1,050 mm, which will afford a maximum escape capacity of 256 within the unit.

*Note: this is based on a 4.1mm/person floor space factor which is consistent with a B2 risk profile which would be applicable to retail premises where sprinklers are provided.*

The layout of escape routes is to ensure that maximum travel distances within the unit to the nearest final exit are to not exceed 20 m where a single direction of escape is available and 50 m where multiple directions are available.

## 4.6 Means of escape for mobility impaired occupants

Both lifts will be designed as evacuation capable lifts in accordance with Section 3.63.6 such that occupants who are unable to evacuate via the staircases are capable of self-evacuation.

## 4.7 External escape routes and assembly points

Once occupants have exited the building, they are able to escape to an ultimate place of safety via the existing public realm areas of Sutton Park Road and Cheam Road.

The arrangement of final exits from the building does not result in instances where occupants must escape within close proximity of external walls of the building.

# 5.0

## Internal fire spread

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## 5.0 Internal fire spread

### 5.1 Linings of walls and ceilings

Although they are not likely to be the materials first ignited, the interior wall and ceiling surfaces can have a significant influence on how fast a fire may spread through the building. This is particularly important in circulation spaces, where the rapid spread of fire is most likely to prevent occupants from escaping. Therefore, any new linings of the walls and ceilings within the building should satisfy the surface spread of flame classification outlined in Table 5-1111Table 5-11 below.

These provisions do not apply to the upper surfaces of floors and stairs and exclude door and window frames, architraves, skirting, picture rails and fixed furniture.

Table 5-1111: Classification of linings of walls and ceilings

Location		European Classification (In accordance with BS EN 13501-1)
<b>Non-residential</b>	Rooms not more than 30 m <sup>2</sup> in area	D-s3, d2
<b>Residential</b>	Rooms not more than 4 m <sup>2</sup> in area	
All other rooms		C-s3, d2
Circulation spaces		B-s3, d2

Thermoplastic materials that do not meet the performances set out in Table 5-1111Table 5-11 above, can however still be used in windows, roof-lights and lighting diffusers in suspended ceilings so long as they comply with the recommendations set out in AD B. Roof-lights used in circulations spaces and rooms may be used so long as they are constructed of a thermoplastic material if:

- The lower surface has a TP(a) rigid or TP(a) classification;
- The size and disposition of the roof-lights accords with the limits in Table 5-2222Table 5-22 below.

Table 5-2222: Limitations applied to thermoplastic roof-lights and lighting diffusers in suspended ceilings and Class 3 plastic roof-lights

Minimum classification of lower surface	Use of space below the diffusers or roof-light	Maximum area of each diffuser panel or roof-light (m <sup>2</sup> )	Max. total area of diffuser panels and roof-lights ad percentage of floor area of the space in which the ceiling is located (%)	Minimum separation distance between diffuser panels or roof-lights (m)
TP(a)	Any except protected stairway	No limit	No limit	No limit
Class 3 or TP(b)	Rooms	5	50	3
	Circulation spaces except protected stairways	5	15	3



## 5.2 Loadbearing elements of structure

The building exceeds 30 m in height, therefore load-bearing elements of structure will be provided with not less than 120 minutes of fire resistance.

Elements that only support the roof of the building need not necessarily require fire resistance. However, where the roof forms the function of a floor, e.g. rooftop plant areas, structural elements supporting these areas should be provided with fire resistance.

In addition, structure supporting compartment walls or protected areas of external walls also needs to achieve the same level of fire resistance as the elements it supports.

## 5.3 Compartmentation and fire resisting enclosures

### 5.3.1 Compartment floors

All floors within the building are to be constructed as compartment floors which achieve 120 minutes of fire resistance (REI 120) from the underside. All service penetrations are to be suitably fire stopped or contained within a 120-minute fire resisting protected shaft.

### 5.3.2 Compartment walls

#### 5.3.2.1 General

All compartment walls and floors will form a complete barrier between the compartments they separate, with compartment walls running the full storey height.

At the junction of a compartment wall and internal non-fire resisting cavity wall (see Section 6.1.3 for junctions with external walls) a cavity barrier will be provided to maintain the integrity of the junction. This cavity barrier will achieve not less than 30 minutes fire resistance (integrity) and 15 minutes (insulation). The following are also considered to be acceptable as cavity barriers within internal cavity walls without any required test evidence or certification.

- Steel at least 0.5 mm thick; or
- Timber at least 38 mm thick; or
- Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
- Calcium silicate, cement-based or gypsum-based boards at least 12 mm thick.

The above also applies to around any openings, e.g. doors, located within fire resisting cavity walls.

The compartment walls will be designed to resist the deflection of the floor above: either by having a suitable head detail between the wall and floor; or can resist the additional vertical loads from the floor as it deflects.

Where a compartment wall meets the underside of the roof, the wall will be taken to the underside of the deck or roof covering and suitably fire stopped. The roof either side of the compartment wall will achieve a classification AA, AB, or AC (national classes) or B<sub>ROOF</sub>(T4) (European class) for a distance of 1,500 mm (See also Section 6.3 for classification of roofs in general).

#### 5.3.2.2 Residential Areas

All residential apartments are to be separated from neighbouring apartments, ancillary areas and internal communal spaces of the building by compartment walls which afford 60 minutes of fire resistance.

Stair 1 and Stair 2 are to be designed as protected shafts and enclosed in walls which achieve 120 minutes of fire resistance.

Refuse storage areas are to be enclosed in compartment walls which afford a minimum of 60 minutes of fire resistance.

### 5.3.2.3 Commercial Unit

The commercial unit is to be separated from the residential areas of the building by compartment walls. While BS 9991 recommends that 60 minutes is sufficient to separate a shop from an apartment above apartments, it is recommended that the fire resistance of compartment walls is increased to 120 minutes due to the use of BS 9251 sprinklers to provide protection to the commercial unit.

Because the total floor area of the unit exceeds 100m<sup>2</sup>, the commercial unit is to be provided with additional compartment walls which afford 120 minutes of fire resistance to sub-divide the unit such that the maximum area of a single compartment is limited to 100m<sup>2</sup>.

### 5.3.3 Fire resisting enclosures

In addition to the compartment described above, the following rooms and spaces will be enclosed in fire resistance construction.

Table 5-3333: Fire resisting enclosures

Room	Fire Resistance Rating (EI X) (minutes)
Storerooms	30
Low-Voltage Plant Rooms	30
Other Plant Rooms	60
Cycle Stores	60*
Plantrooms containing Medium and High-Voltage electrical plant or substations	120
Plantrooms Containing internal combustion engines	120
Boiler Rooms	120
Sprinkler Plantroom	120
UKPN-owned / operated substations	240

\* While existing guidance would recommend 30 minutes fire resistance to cycle store rooms, the increasing prevalence of e-bikes and the increased fire risk posed by high-density Li-Ion batteries is not considered in this guidance. Therefore, it is recommended that the fire resistance is increased to 60 minutes.

## 5.4 Concealed spaces (ceilings and floors)

Cavity barriers will be provided to sub-divide any cavities, so that they do not exceed 20 m in any direction (this can be increased to 40 m where the space below the cavity is open plan, provided that the surfaces within the cavity achieve Class 1 or better, and there are cavity barriers above any walls bordering the open-plan room).

Additional cavity barriers should be provided to close any cavities, and also be located above/below any fire resisting construction forming a protected escape route.

All cavity barriers should achieve a minimum of 30 minutes fire resistance (integrity) and 15 minutes fire resistance (insulation). They should be tightly fitted in accordance with the manufacturer’s instruction and, where practicable, mechanically fixed in position.

Around any openings, e.g. fire resisting door frames, windows, etc., the cavity barriers may be formed of:

- Steel at least 0.5 mm thick; or
- Timber at least 38 mm thick; or

- Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
- Calcium silicate, cement-based or gypsum-based boards at least 12 mm thick.

**Note:** *In some instances, additional cavity barriers may be required where it has been identified that fire detectors are omitted from ceiling cavities as part of a fire risk assessment.*

## 5.5 Fire stopping of openings and services

All openings and joints between fire separating elements will be adequately fire stopped and all openings for services that pass through fire separating elements will be:

- Kept as few in number as possible;
- Kept as small as practicable; and
- Fire stopped (which is the case of pipes or ducts allow for thermal movement).

The selection of fire stopping products and materials will take account of the size and nature of the gap and any anticipated differential movement.

### 5.5.1 Fire doors

Internal doors to the protected hallway of an apartment are to be 20-minutes fire doors. It is not necessary to provide these doors with self-closing devices or smoke seals.

Elsewhere, doors within fire resisting construction will be fire doors achieving the same level of fire resistance as the wall and fitted with self-closing devices, unless the fire door is normally kept locked shut, e.g. storerooms, service risers. Fire doors to protected stairs and any service risers may be half the fire resistance of the wall, but in no case less than 30 minutes fire resistance.

Cold (flexible-edged) smoke seals will be provided to all doors forming part of protected escape routes, i.e. the protected stairs and common corridors.

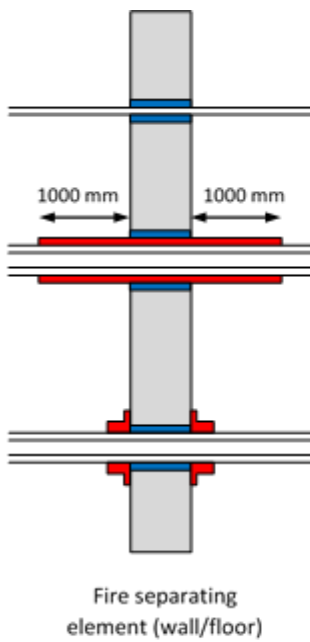
Hold open devices, which release the door on activation of fire alarm system, may be provided where the doors could provide a hindrance to normal circulation (i.e. cross-corridor doors).

### 5.5.2 Ventilation ductwork

Where ductwork passes through fire resisting construction, it will be designed in accordance with Section 3.4.2 of this report.

### 5.5.3 Fire stopping of pipes

Pipes that pass-through fire resisting construction, unless they are contained within a protected shaft, will satisfy the provisions detailed in Figure 5-1111Figure 5-11 below:



- **Fire stopping only** – maximum allowable diameters:
  - **160 mm** – non-combustible pipes.
  - **110 mm** – pipes of lead, aluminium, aluminium alloy, fibre-cement or uPVC through protected shafts (excluding stairways and lifts shafts).
  - **40 mm** – pipes of any other material or situation.
- **Sleeving** – pipes of lead, aluminium, aluminium alloy, fibre-cement or uPVC with a maximum diameter of 160 mm can be provided with a sleeve of non-combustible pipe. The sleeving needs to extend 1000 mm either side of the fire-separating element.
- **Proprietary seals** – suitable for any pipe diameter. Install in accordance with manufacturer's instructions.

Figure 5-1111 Fire stopping for pipes

# 6.0

## External fire spread

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## 6.0 External fire Spread

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### 6.1 Construction of external walls

#### 6.1.1 Material classification

All materials and products (other than those specifically stated below) forming part of the external wall construction will achieve a classification A2-s1, d0 or better, as defined by BS EN 13501-1. This includes any specified attachments, such as balconies, brise soleil, etc. fixed to the external wall.

The following elements are not required to achieve the above classification:

- Internal linings of the external walls will follow Section 5.1 of this report;
- Membranes (these should achieve a minimum Class B-s3, d0);
- Window frames and glass, including laminate glass, (window spandrel panels and infill panels must comply);
- Thermal breaks, where they do not span compartments;
- Shop front signs and similar.

#### 6.1.2 Provision of cavity barriers in external walls

Cavity barriers will be provided in any cavities formed within the external wall construction as follows:

- To close any openings, e.g. windows doors, service penetrations, etc;
- In line with any compartment walls; and
- To sub-divide a cavity such that it does not exceed 20 m.

Cavity barriers within the external wall construction will achieve a fire resistance of not less than 30 minutes for integrity and 15 minutes for insulation. Where provided around an opening or in external stud-walls the cavity barriers may be formed of:

- Steel at least 0.5 mm thick; or
- Timber at least 38 mm thick; or
- Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
- Calcium silicate, cement-based or gypsum-based boards at least 12 mm thick.

Where practicable, the cavity barriers should be tightly fitted to rigid construction and mechanically fixed in place.

### 6.2 Space separation analysis

To limit the potential for fire spread between buildings, it is necessary to provide a sufficient separation distance between them. The separation distance required depends on the size of the fire compartment, the amount of unprotected area provided on the opposing façade and the provision of an automatic sprinkler system. The Enclosing Rectangles Method outlined in BR 187: *External fire spread – Building separation and boundary distances Second edition* has been used to determine the requirements for limiting external fire spread for this building.

For the purposes of the analysis, the boundary distance is taken from the face of the façade to the opposing site boundary. Where a roadway is located along the site boundary, then the distance can be extended to the centreline of the road.

In accordance with the recommendations of BRE 187, the benefit provided by sprinkler systems in relation to reductions in expected fire sizes and the resultant thermal radiation emitted from compartment fires may be quantified by treating any boundary distance that is greater than 1m as if it were double the actual distance.

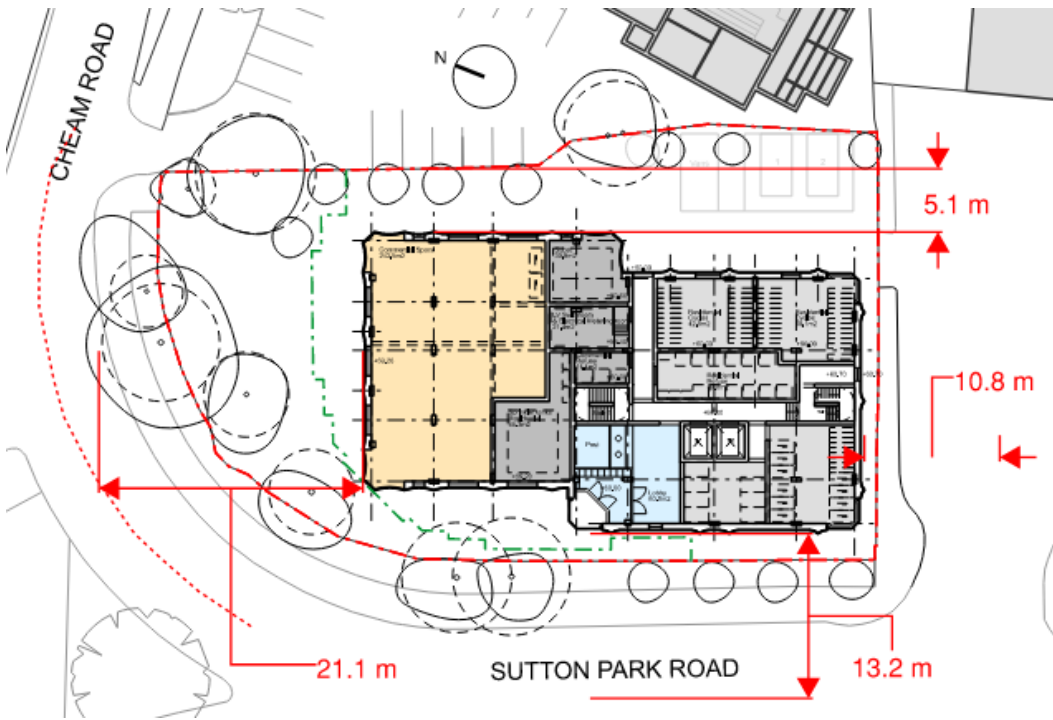


Figure 6-1111: Measurement of boundary distances

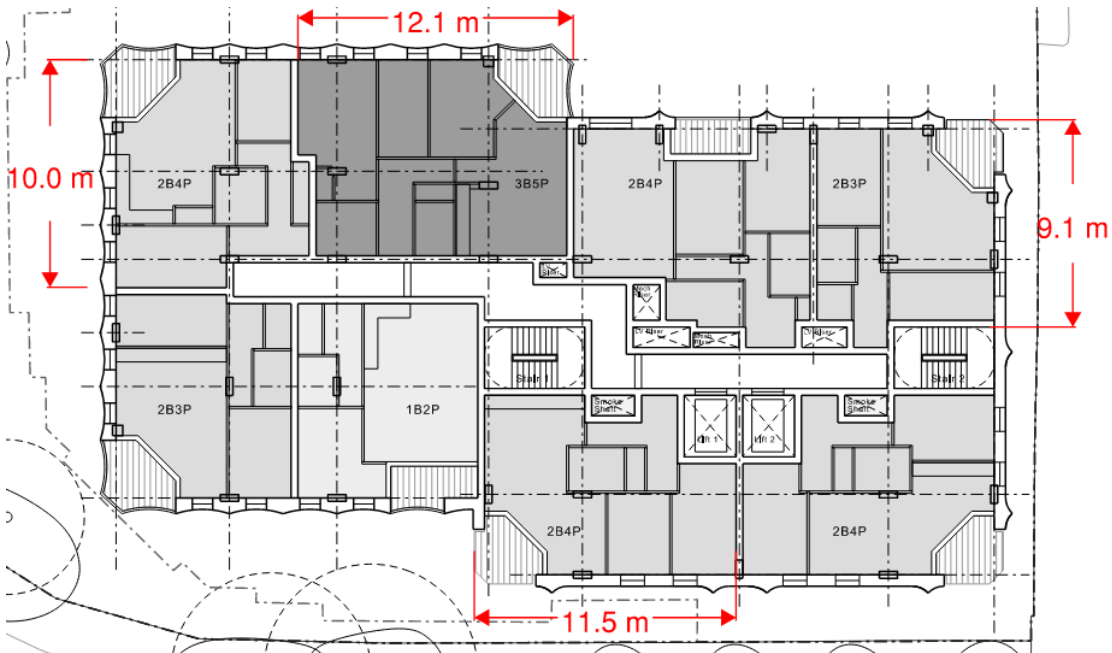


Figure 6-2222: Measurement of largest compartments for residential areas

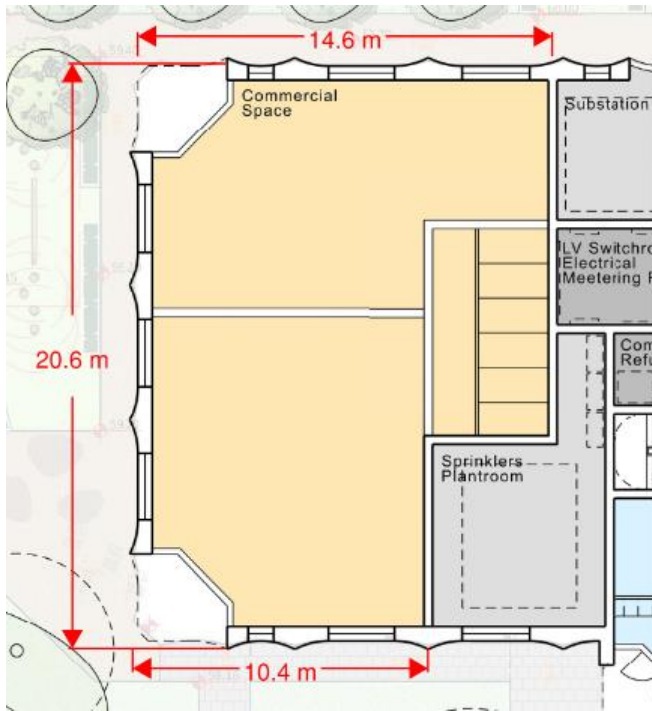


Figure 6-3333: Measurement of compartment dimensions for commercial unit. Note: Presence of internal compartment wall has been ignored to allow future flexibility of this subdivision at later design stages

Table 6-1111: Residential area external fire spread assessment

Elevation	Enclosing Rectangle (W x H)	Boundary Distance	Acceptable Unprotected
North	3.1m x 10.3m	21.1m	100%
South	3.1m x 9.1m	10.8m	100%
East	3.1m x 12.1m	5.1m	100%
West	3.1m x 11.5m	13.2m	100%

Table 6-2222: Commercial unit external fire spread assessment

Elevation	Enclosing Rectangle (W x H)	Boundary Distance	Acceptable Unprotected
North	4.3m x 20.6m	21.1m	100%
East	4.3m x 14.6m	5.1m	100% (52.4%)*
West	4.3m x 10.4m	13.2m	100%

\* Figures in bracket denote acceptable unprotected area if sprinklers are not provided

### 6.3 Construction of roofs

The building is within 6m of a relevant boundary, therefore all roof covering systems are to be designed to achieve a classification of B<sub>ROOF</sub>(t4) in accordance with BS EN 13501-5.



# 7.0

## Access and facilities for the fire service

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## 7.0 Access and facilities for the fire service

### 7.1 Water supplies

There should be sufficient hydrants located near to the building for use by the fire service. The location and suitability of hydrants will need to be determined by the fire service based on their risk assessment. This is to ensure that there is sufficient flow and pressure in the main to support fire-fighting activities, which can vary based on the location, size, height and use of the building.

An existing fire hydrant has been identified as illustrated in Figure 7-1111Figure 7-11. This hydrant should be inspected to ensure that it is still in working order in accordance with BS9990.



Figure 7-1111: Existing hydrant location in site vicinity

### 7.2 Vehicle access

Roadways for fire appliances should be a minimum of 3.7 m wide, reduced to 3.1 m between gates and will have a minimum carrying capacity of 12.5 tonnes. Where a roadway forms a dead-end greater than 20 m, suitable turning provisions will be provided.

It is expected that the existing public highways of Sutton Park Road and Cheam Road will provide suitable site access to the building.

Building access for the residential areas is to be based on provision of suitable stopping location for a fire service pump appliance to within 18 m of a fire main inlet.

BS9991 refers to the guidance contained within BS9999 for the design of firefighting shafts. Clause 20.2.2 of BS9999 requires that a firefighting shaft be accessed from outside or via a protected corridor. The current proposed entry point

for the attending fire service will be via the main entrance lobby which provides access to Stair 1, this is considered reasonable subject to agreement with the authority having jurisdiction and the local fire service based on the following;

- In the event that a fire initiates in the reception space;
  - The fire service will be able to fight the fire directly from outside the building without requiring access to the firefighting shaft.
  - As it is expected that there will only be a single seat of fire within the building, in this scenario there is no fire on the upper levels. Therefore, the fire service do not require access to the upper levels via the fire fighting stair or the firefighting lift;
  - If it is desired to access the firefighting shaft, a secondary means of access is provided by the rear of the building;
  - If during the course of an incident on site the attending fire service determine that further evacuation is necessary, occupants are provided with an alternative means of escape stair (stair 2) which does not communicate with the ground level accommodation
- In the event of a fire on the upper levels;
  - As it is expected that there will only be a single seat of fire within the building, in this scenario there is no fire within the reception space. Therefore the reception space is free of fire thus will be suitable and safe for access/egress

Access to the commercial unit will be developed as the design is progressed. Entry doors into the unit will be sited such that all areas of the commercial unit will be within 45m of the fire service access roads along a suitable hose-laying route.

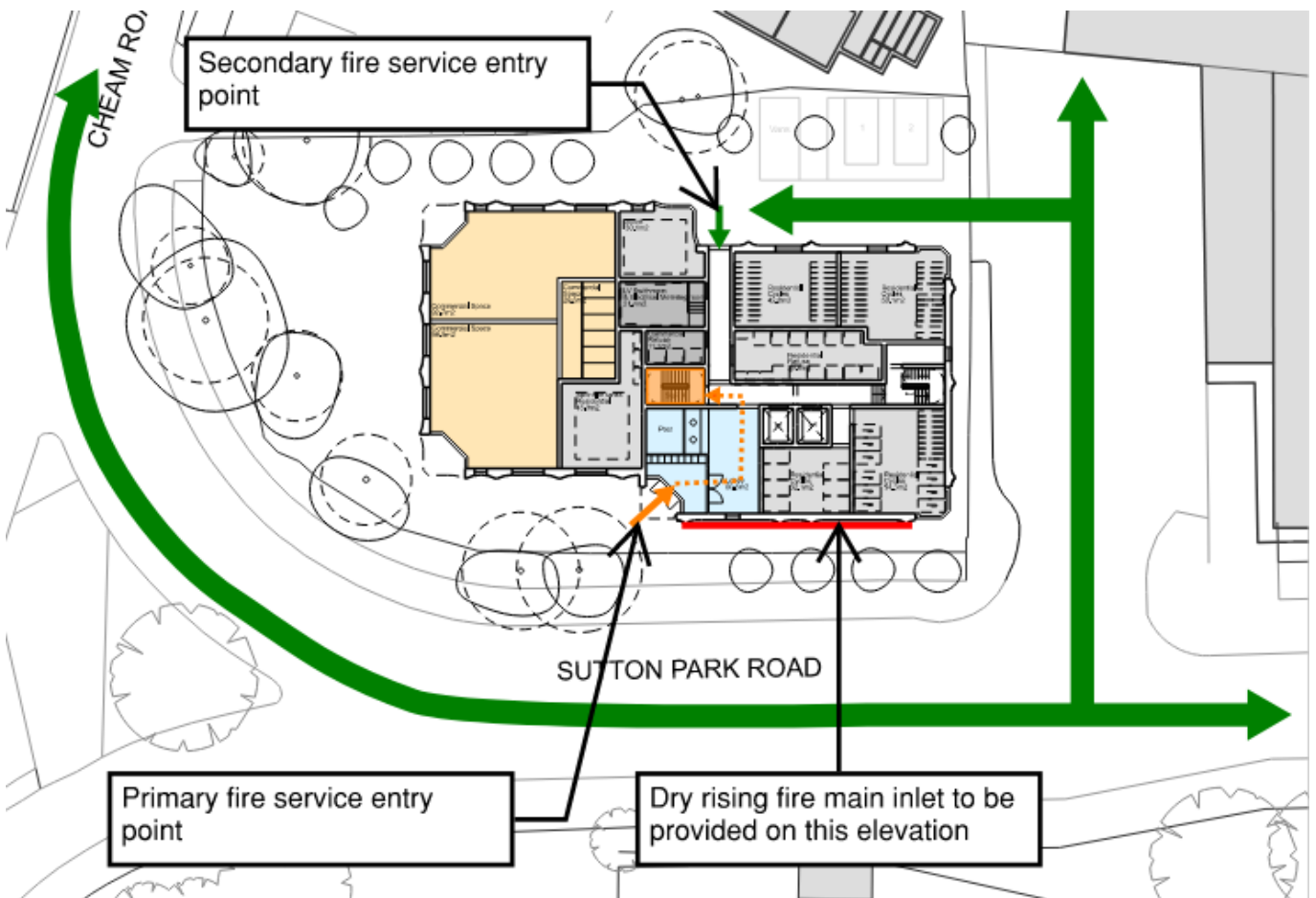


Figure 7-2222: Fire service access roadways and fire-fighting shaft entry point.

### 7.3 Internal facilities

Because the building exceeds 18 m in height, it is required to be provided with a fire-fighting shaft. Stair 1a will be constructed as a fire-fighting stair in accordance with the arrangement of Figure 35 of BS 9991. The fire-fighting stair and lift are to be contained within construction which affords 120 minutes of fire resistance from outside of the shaft and 60 minutes from inside as a minimum.

The fire-fighting lift will be accessed from the common corridor which will be provided with smoke ventilation in accordance with Section 3.4.1.1. The maximum distance between the fire-fighting stair entrance and the lift will not exceed 7.5m.

A dry-rising fire main will be provided with the landing valve sited within the staircase at each floor level. The landing valve is to be positioned such that all areas on the floor are within 60m of the landing valve when measured along a suitable hose-laying route. Based on the plans provided, this hose run distance will be adhered to.

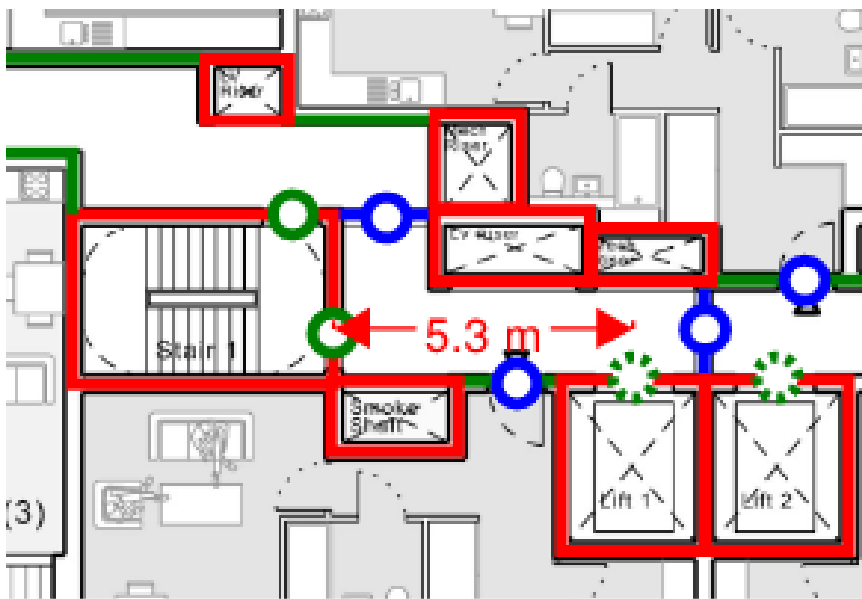


Figure 7-3333: Fire-Fighting shaft arrangement. Red = 120-minute fire-resisting construction. Green = 60-minute fire resisting construction. Blue = 30-minute Fire Resisting Construction.

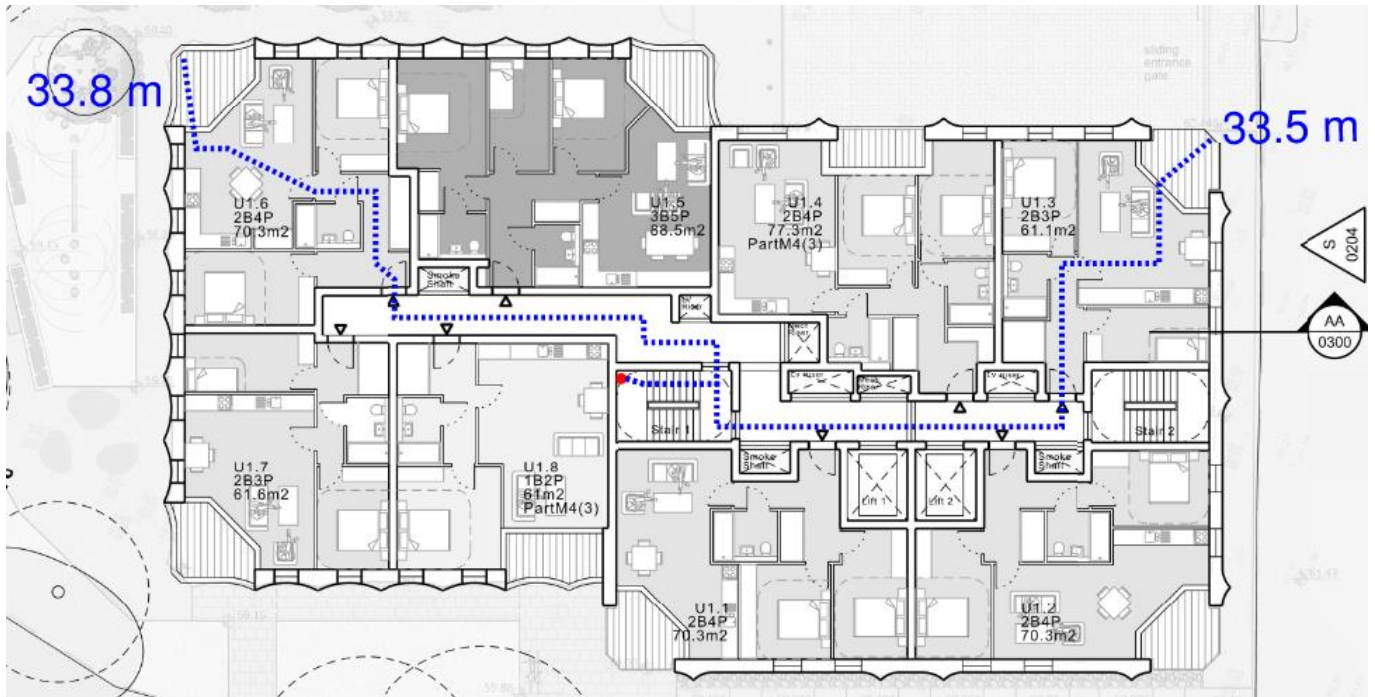


Figure 7-4444: Maximum hose distance

# 8.0

## Fire safety management

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## 8.0 Fire safety management

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Suitable fire safety management plans will be developed by the Landlord and tenants, taking into account the information contained within this fire strategy report.

The management should be able to identify and react to any changes as they occur, e.g. changes to the occupancy and fire growth characteristics, etc. and through a suitable fire risk assessment identify and implement any alternative protection and management measures that may be required as a result.

The management of fire safety should be integrated with other management systems for the building and it is likely that a number of individuals and/or companies, e.g. Landlord, tenants, the fire alarm contractor, etc. will be responsible for fire safety for the building. There is a requirement to ensure that the fire safety measures and responsibilities are shared between all responsible persons and organisations.

Staff should be provided with training appropriate to their role.

Specific fire safety responsibilities for certain staff will include:

- Checking the building to ensure everyone has evacuated;
- Assisting in the evacuation of disabled persons;
- Guiding persons to the nearest exit;
- Using first-aid fire-fighting equipment;
- Contacting and liaising with the fire service.

It is recommended that a fire safety manual is created that contains all the design information and operational records for the building relating to fire safety. The fire safety manual should include:

- A description of the assumptions and design philosophies for the building, i.e. the fire safety strategy (this document);
- Floor plans detailing escape routes, assembly points, fire service access, etc.;
- Evacuation procedure;
- Full description of all passive and active fire protection systems within the building, compartment walls, fire detection systems, etc., including all certification documents;
- Fire risk assessments;
- Maintenance and test records of fire safety systems;
- Staff training records.

The fire safety manual should be kept up to date on a routine and regular basis by the fire safety manager or a competent person nominated for the task and should also record feedback from staff and other users of the building. If any fire safety equipment is found to be unreliable, records should be kept of the problems experienced. If deemed necessary, this information should be provided to the particular manufacturer.

The fire safety manual should be reviewed, and its procedures tested annually, or whenever alterations are made to the building, in accordance with a documented procedure. The review should include:

- All plant and equipment interface controls, to ensure that equipment is all in working order and that maintenance procedures are being followed;
- All staff duties and training procedures;
- Records, as-built drawings and specifications of the fire protection measures;
- Responses to any false alarms, “near misses” or real fires that have occurred since the previous review.

The fire safety manual should aid that those responsible in complying with the Regulatory Reform Order and should be kept on site at all times. At least one maintained identical copy should be retained in a separate location away from the premises.

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