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GM
LONDON

Fire Safety Strategy Report

Required at: 19-37 Highgate Road, London, NW5 1JY

Prepared on behalf of: GM London

August 2022 Edition A

Project: 19-37 Highgate Road, London, NW5 1JY

Document: Fire Safety Strategy Report

Revision History:

Edition	Date Issued	Comment	Prepared By	Reviewed By	Approved By
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Revision	Page No.	Date	Details	Approved

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1 EXECUTIVE SUMMARY

Osborn Associates have been commissioned by GM London to provide fire safety consultancy for the new mixed-use development at 19-37 Highgate Road, London, NW5 1JY. This report documents the fire strategy for the development using the current regulations in order to provide information on safety concerns and recommendations on how to achieve better fire safety for current standards.

This Fire Safety Strategy has been developed based on the guidance of BS 9991:2015 for the residential areas, with guidance in BS 9999:2017 followed for the design of the non-residential areas.

Where departures from the prescriptive design basis exist, other fire engineering principles are employed to support alternative solutions in the fire safety design and the proposals are documented.

The residential areas of the building will utilise a “defend in place” evacuation strategy, where only the occupants within the apartment of fire origin will evacuate in the first instance. The assisted living unit occupants will be assisted by the assisted living personnel that will have 24/7 presence on site.

The non-residential and ancillary areas of the building will form separate compartments from the residential areas and will evacuate independently from other areas. All the occupants within the individual non-residential and ancillary areas themselves will evacuate simultaneously upon alarm.

The residential apartments provided with Grade D1 LD1 standard automatic fire detection and alarm system in line with the BS 5839-6:2019+A1:2020.

The alarm systems within assisted living apartments will be connected to an alarm panel within the assistance staff office to alert them of a fire within the apartment and initiate assisted evacuation procedures.

An L5 standard of automatic fire detection and alarm is provided within the common corridors and lobbies to activate smoke control provisions in line with BS 5839-1:2017. This will also be used to provide alarm to the communal terrace occupants, with sounders provided on the terraces alerting the occupants of the corridor being affected by fire.

Ancillary residential areas will be provided with L4(M) fire alarm system designed and installed in accordance with BS 5839-1 and BS EN 54-23: 2010 for visual alerting devices where installed.

The non-residential social enterprise area of the building will be provided with L4(M) fire alarm system as part of the basebuild design designed and installed in accordance with BS 5839-1. This will need to be reviewed as part of the tenant fire strategy.

Category 4 sprinkler system will be provided throughout the building designed in line with the recommendations of BS 9251:2021.

This strategy report has not been developed to address property protection. However, the features that are included for life safety will contribute to some extent to business and property protection. Apart from where noted in this report, the designs will be in accordance with the recommendations of BS 9991:2015, BS 9999:2017 and the documents referenced therein.

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

2 LEGISLATION APPLICABLE

This Fire Strategy Report outlines the proposed fire safety strategy for the new mixed-use development at 19-37 Highgate Road, London. The purpose of this report is to set out and detail the fire safety principles that would be present in the building if it was to be constructed at the time of this report.

2.1 RELEVANT LEGISLATION

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

- The Building Regulations 2010 as amended 2018
- Regulatory Reform (Fire Safety) Order 2005

2.2 BUILDING REGULATIONS 2010

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

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

- Regulation B.1 Means of warning and escape
- Regulation B.2 Internal fire spread (linings)
- Regulation B.3 Internal fire spread (structure)
- Regulation B.4 External fire spread
- Regulation B.5 Access and facilities for the fire service.

This fire strategy, along with plans issued by the architect, is intended to demonstrate full compliance with the above regulations.

2.3 REGULATORY REFORM (FIRE SAFETY) ORDER 2005

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

The duty of ensuring that the requirements of the Order are met rests with the Responsible Person, who must undertake a risk assessment for the purpose of identifying the fire precautions he needs to take.

2.4 STATUTORY CONSULTATION

During the Building Regulations application process, the building control body is required to formally consult with the local fire authority. The purpose of this consultation is to give to the fire authority the opportunity to make observations with respect to the Building Regulations and to provide an opportunity to make the applicant aware of action that may have to be taken to meet the requirements of the Fire Safety Order.

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

2.5 FIRE RISK ASSESSMENT

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

According to PAS 79 – Fire Risk Assessment – Guidance and a recommended methodology – the risk assessment can only validly be carried out when a building is in normal use. However, it should be noted that there is no grace period between occupation and completion of the risk assessment, and thus failure to undertake a risk assessment prior to occupation could constitute a breach of legislation. OAL are therefore of the opinion that a pre-occupation risk assessment is essential to assist the responsible person in fulfilling their legal obligations.

The Building Regulations do not specifically require a risk assessment to be undertaken. However, the development of a fire strategy has risk assessment at its core, thereby ensuring that the measures provided in the building reflect the risk presented by those buildings intended use.

2.6 REGULATION 7 – MATERIAL AND WORKMANSHIP

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

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

2.7 REGULATION 38

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

The aim of this requirement is to provide the responsible person with appropriate information to assist him to operate and maintain the building in reasonable safety.

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

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

3 BUILDING DESCRIPTION

The 19-37 Highgate Road is a new mixed-use development consisting of the following:

- Residential Block A, consisting of 6 residential floor levels (G+5) with top floor height of 16.68m
- Residential Block B, consisting of 6 residential floor levels (G+6) with top floor height of 21.28m
- Substation, LV Switch room, Bin Store, Storage and Bike Storage areas at Ground Floor level of Block A
- Basement level containing plant areas and accessible from both Blocks A and B
- Office area for the staff associated with assisted living units located at Ground Floor level of Block A
- Non-residential social enterprise area located at Ground Floor level of Block B

The residential blocks are accessed via a single stair each. The Basement areas are accessed via sections of the stair separate from the sections of the stairs serving the residential floors above and are provided with individual escape routes.

The assisted living office area is accessible either directly from outside or via the protected smoke vented common corridors also serving the Ground Floor assisted living apartments.

The non-residential social enterprise area is separate from the adjacent areas and is accessible directly from outside.

The building layout is shown in Figure 1 at Ground Floor level, with the top floor heights of the residential blocks shown in Figure 2.

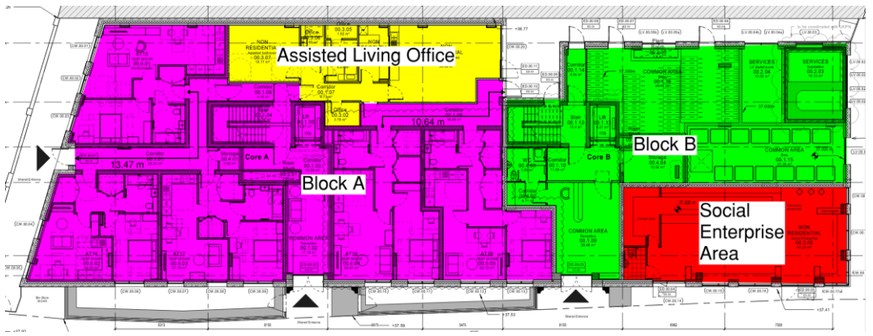


Figure 1 – Building Layout

Figure 2 – Building Block Heights

4 MEANS OF ESCAPE

4.1 RESIDENTIAL AREAS

4.1.1 Evacuation Strategy

The residential apartments will evacuate based on a “defend-in-place” basis, where only the occupants of the fire apartment evacuate in the first instance. The occupants of the remaining apartments will only evacuate if they desire to do so, are affected by the effects of a fire, or advised to do so by the attending London Fire Brigade.

The assisted living unit occupants will be assisted by the assisted living personnel that will have 24/7 presence on site.

The ancillary areas independently from other areas on simultaneous evacuation basis, with all occupants of the affected ancillary area evacuating on alarm.

The communal terraces provided on Fifth Floor in Block A and Roof Level in Block B will evacuate on detection of smoke or fire within the associated common corridor providing access to the terrace.

4.1.2 Internal Apartment Design

Apartment Types

Two types of apartment layouts will be provided within the development:

- The apartment layout with an open-plan design, with bedrooms accessed from the living area
- The apartment layout with apartment hallways providing access to all the rooms within the apartment

It is however proposed to design both apartment types in line with the open-plan apartment guidance, with the entrance hallway construction not provided with fire resistance, to simplify the internal fit out of the apartments and to provide a consistent approach to the apartment design throughout the building.

Open-Plan Apartments

The BS 9991 guidance recommends that the following should be provided where the flats are to have open plan design:

- Grade D1 LD1 automatic fire detection and alarm system provided
- Automatic water fire suppression system should be provided within the flats
- The size of the open-plan apartment should not exceed 16m x 12m, with apartments exceeding 8m x 4m provided with enclosed kitchens
- The ceilings within flats should be at least 2.25m high

The BS 9991 guidance also recommends that the open plan apartments should not exceed 16m x 12m in size and that the kitchen areas should be enclosed in open-plan apartments exceeding 8m x 4m.

However, some of the apartments exceed the 16m x 12m limit, at approximately 18m x 8.5m. This is considered reasonable, as the overall area of the apartment would still be lower than that of the code compliant arrangement, at 153m^2 against 192m^2.

Open Kitchens in Larger Open-Plan Apartments

All of the apartments are designed with open kitchens, with some of the apartments exceeding 8m x 4m size limit recommended by BS 9991 guidance.

However, the basis for the requirement is based on the research study conducted by BRE for NHBC “Open plan flat layouts: Assessing life safety in the event of a fire” which has not tested flat layouts with open kitchens that exceeded 8m x 4m in size due to cost. Therefore, the recommendation is not based on the larger flats representing a higher inherent risk in the event of a fire, but on the lack of test data for larger apartments.

Larger flats are expected to result in better conditions for the escaping occupants in the event of a fire. The nature of the fire load present within the flat and the expected size of a fire is the same for both larger and smaller apartments due to the provision of fire suppression. However, larger apartments will present a larger smoke reservoir area that will take longer to fill, hence improving the conditions experienced by the escaping occupants at the same point since the start of a fire in comparison to the smaller flats.

Therefore, provision of larger flats with kitchens open to the adjacent areas is considered reasonable.

Cooker Hob Position

As all flats are designed without an enclosed kitchen, an open-plan kitchen living space must be designed to ensure that the kitchen is located remote from the escape route from the apartment such that escape is not impeded by the cooker / hob location.

BS 9991 recommends that cooking facilities should be remote from the final exit route from an apartment. However, there is no defined definition on what is classed as remote within the guidance document.

In the absence of a defined number, it is recognised and understood from guidance on external escape routes to use a distance of 1800mm with a 500mm escape route (i.e., 2.3m overall).

This is achieved in most of the apartments, with the exception of AT17, where the cooker hob is located within 2.15m of the kitchen entrance, as shown in Figure 3.

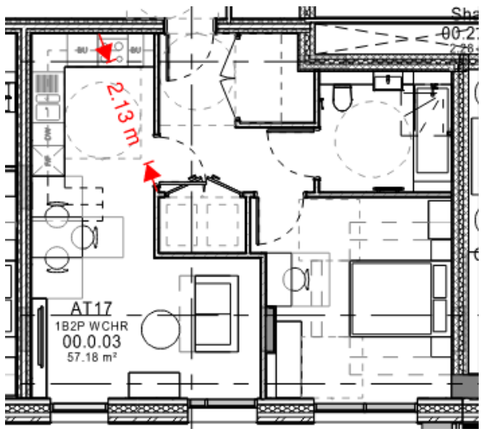


Figure 3 – Apartment AT17 with Cooker Hob within 2.3m from the Escape Route

As such, it is recommended that the hob position is changed. If this is not possible, an alternative solution would be to install induction hobs incorporating temperature cut-out timers in accordance with BS EN 50615: 2015, which will reduce the likelihood of a fire starting in the hob area.

Escape from Private Balconies and Terraces

Building apartments are provided with private balconies and terraces. The BS 9991 guidance provides the following recommendations for escape from private balconies or terraces:

- The escape route from the balcony should not pass through more than one access room
- The interior of the access room should be clearly visible from all parts of the balcony unless provided with a fire detection and alarm system in accordance with BS 5839-6:2013
- Any cooking risk in the access room should be enclosed in fire-resisting construction unless:
  - The cooking risk is remote from the balcony and positioned so that does not prejudice the escape route through the 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
- Where the travel distance from the balcony access door to the furthest point on the balcony exceeds 7.5m, it should be provided with an alternative escape route without going via the same access room, or the access room should be provided with automatic smoke detection.

As the apartments will be provided within an LD1 standard of automatic fire detection and alarm, and the apartment cooking hobs will be located to not affect the escape from the apartments, this is considered reasonable.

4.1.3 Residential Common Corridors

The building will be provided with sprinkler protection throughout. Therefore, the travel distances within the smoke vented common corridors can be up to 15m and 7.5m where measured to smoke vented stair lobby. This is achieved within all the common corridor layouts present within the building.

As per BS 9991 guidance, common corridors serving the residential areas of the building will need to be provided with smoke venting. The smoke venting could be provided via one of the following:

- 1.5m^2 AOV to the exterior of the building located adjacent to the stair at as high level as practicable.
- A natural smoke shaft with cross sectional area of 1.5m^2 located at the remote end of the common corridor.
- A mechanical smoke extract shaft

The 1m^2 AOV will also need to be provided at the head of both Stair A and Stair B.

Where mechanical smoke venting is provided, the mechanical smoke venting system supplier will need to demonstrate the suitability of the proposed system. This can be via a comparative Computational Fluid Dynamics study showing that the system achieves the performance at least equivalent with a code compliant natural smoke venting system suitable for the proposed corridor.

The common corridor layouts are shown in the Figure 4 - Figure 8 below.

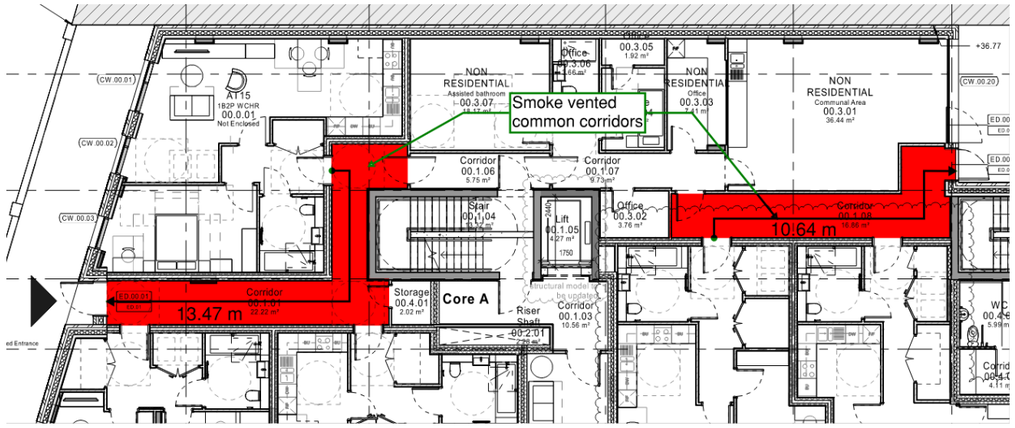


Figure 4 – Block A Ground Floor Smoke Vented Common Corridors

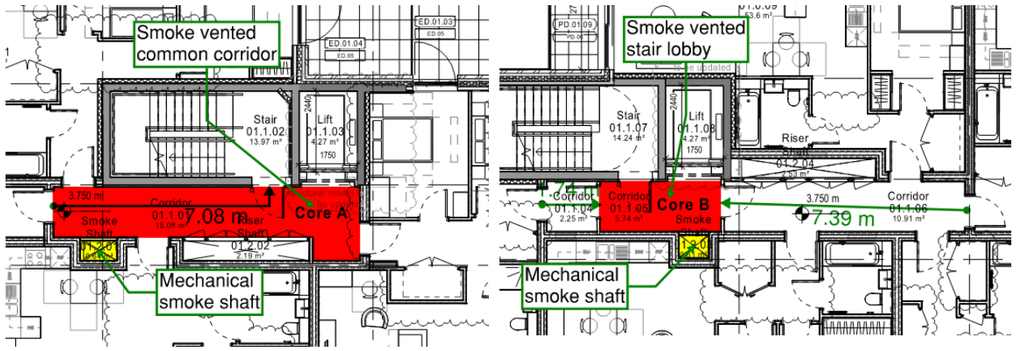


Figure 5 – First Floor – Fourth Floor Common Corridor Layout

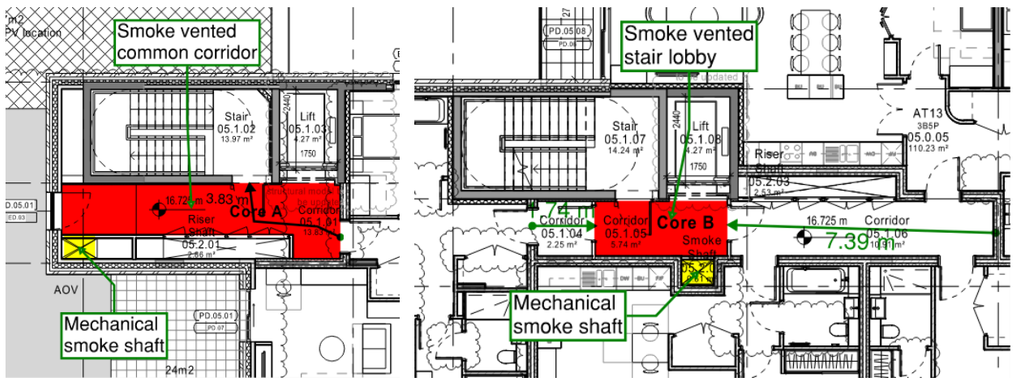


Figure 6 – Fifth Floor Common Corridor Layout

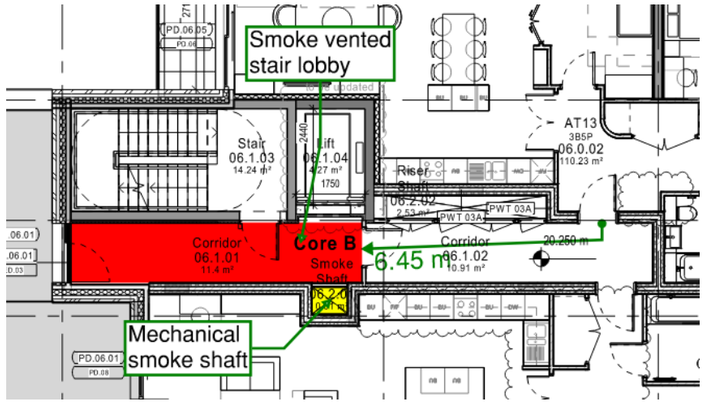


Figure 7 – Block B Sixth Floor Common Corridor Layout

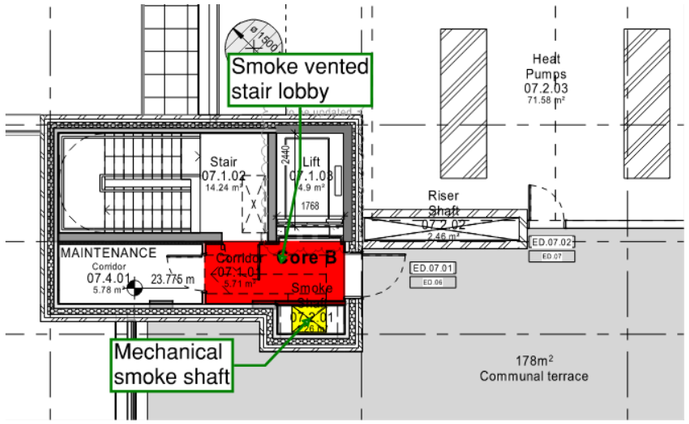


Figure 8 – Block B Seventh Floor Smoke Vented Stair Lobby

4.1.4 Assisted Living Apartments

There will be five assisted living apartments provided at Ground Floor level of Block A with an associated office for the assisted living staff. This is shown in Figure 9.

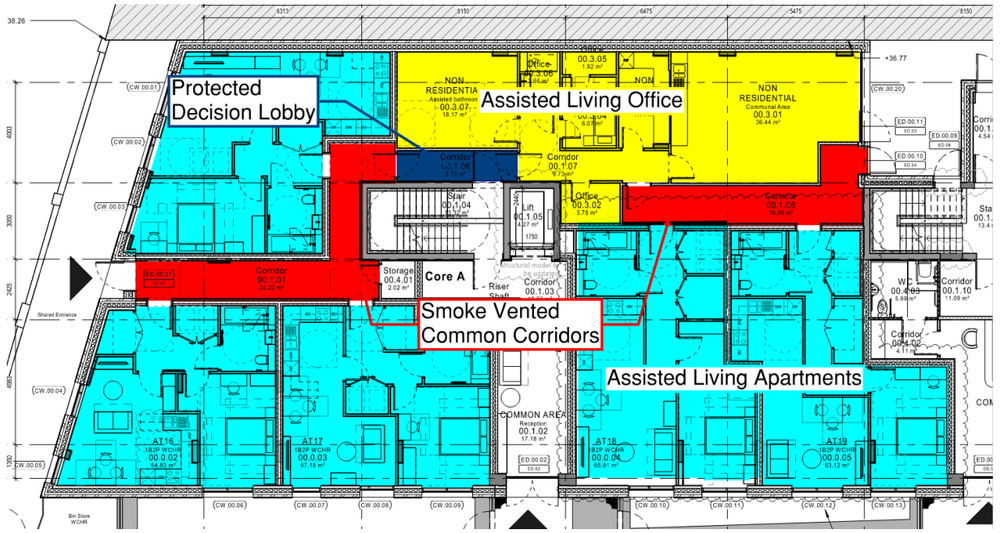


Figure 9 – Assisted Living Areas at Block A Ground Floor

As it is understood that some of the occupants may not be able to evacuate independently without assistance, the guidance for specialised housing contained within BS 9991:2015 will need to be applied to the Ground Floor residential units. The guidance recommendations are as follows:

- Travel distances within the common corridors should be limited to 7.5m from the flat door to either a final escape route, protected stair entrance or another protected corridor zone
- Travel distances within the apartments should be limited to 9m from any point within the apartment to the flat entrance door
- Self-closing devices provided to doors.
- Any wheelchair/mobility scooter charging points to be enclosed in 30 minutes fire resisting construction.
- The apartment should not be open-plan apartments.

The travel distances requirements are currently not achieved within both common corridors, with maximum travel distances to the final exit of 12.4m and 8.6m, and within two apartments to the North adjacent to Core B area, with travel distances up to 12.8m. The apartments are also designed following the guidance for open plan apartments. However, this is considered reasonable based on the following:

- All the building areas are provided with sprinklers throughout, controlling the fire growth rates and reducing the risk of smoke and fire affecting the escape routes. Additionally, both corridors providing access to the apartments will be provided with smoke venting.
- LD1 standard of detection within the apartments will enable earliest possible detection of a fire within the apartments. The automatic fire detection and alarm systems within the assisted living apartments will be connected to a fire alarm panel within the assistance office to alert the assistance personnel of a fire immediately on detection.
- The assistance office area is located within 20.8m from the furthest ground floor apartment. Based on the walking speed in fire situations of 1.4m/s recommended by PD 7974-6, this would result in the travel time of approximately 14.9s, enabling rapid response to a fire situation.

- Occupants could potentially be evacuated via the other common corridor, accessible through a protected decision lobby, if personnel deem it necessary. Once in the protected lobby, the occupants and the assisting personnel should not be in an immediate danger of being affected by the effects of fire and smoke.
- While designed following the guidance for open-plan apartments, the hallway enclosure will still be provided. Although not fire resisting, this will still impede the smoke spread within the apartment.

The above should be discussed and agreed with Building Control.

4.1.5 Escape from Communal Terrace Areas

There are two communal terraces provided within the building:

- Communal terrace at Fifth Floor level in Block A accessed via the smoke vented common corridor at this floor level.
- Communal terrace at Roof Level in Block B accessed via the smoke vented stair lobby at this floor level.

The BS 9991 guidance recommends that where communal terraces are provided in residential buildings, the travel distances should be limited to 45m. This is achieved from both terrace areas.

As a single escape route is provided from both terrace areas, the maximum occupancy of each terrace will need to be limited to 60 occupants at any one time.

4.1.6 Final Exits from the Stairs

Core A

The final escape route from Core A section serving the upper floors is shown in Figure 10.

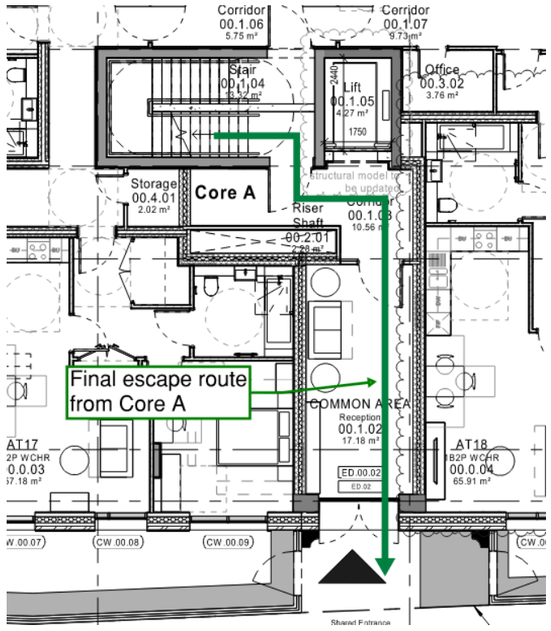


Figure 10 – Final Escape Route from Core A at Ground Floor Level

Core A discharges to outside via the common area, which will be maintained as a fire sterile area with fire resisting post boxes. As part of the management strategy for the building it should be ensured that no combustibles are stored within the common area.

An access is also provided to the riser from within Core A final escape route. However, the riser access will be via a 120-minute fire resisting removable panel that is only going to be removed for periodic maintenance access. Therefore, this is considered reasonable.

Core B

The final escape route from Core B section showing the upper floors is shown in Figure 11.

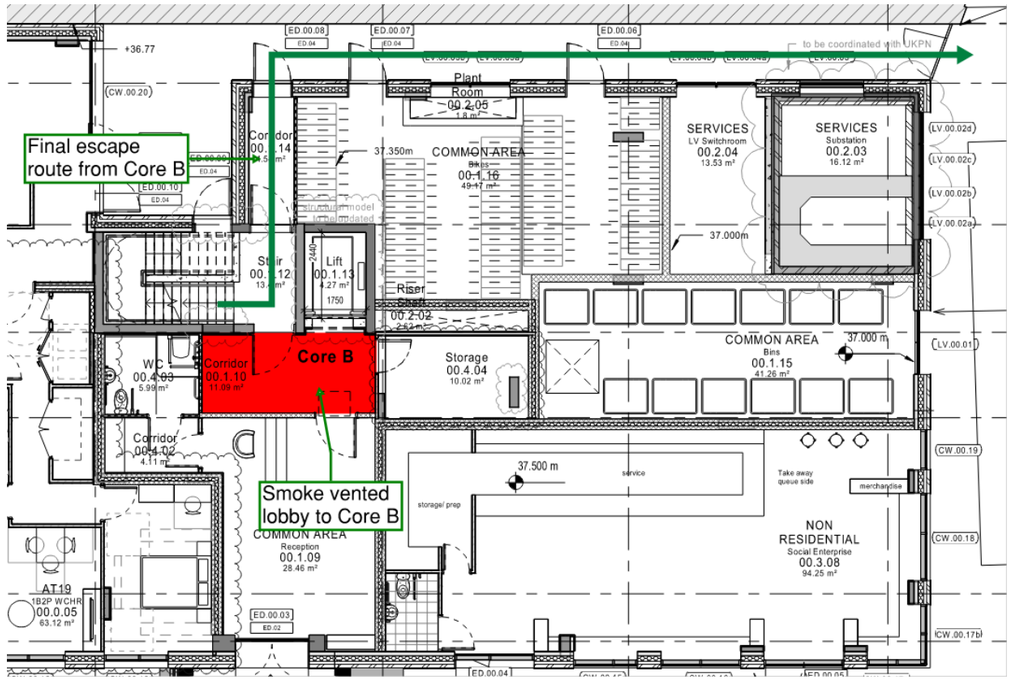


Figure 11 – Final Escape Route from Core B at Ground Floor Level

The final escape route from Core B will be directly to outside via a protected corridor. The Core B will also be separated from adjacent areas at Ground Floor level by smoke vented protected lobby. Protection will be provided to the external elevation that the final escape route passes along.

4.1.7 Escape From Ancillary Accommodation

Basement

The Basement level will contain several service plant rooms that will be accessed via independent sections of Core A and B stairs via a corridor.

The travel distances from the furthest point of the Basement areas to the entrance of either of the protected stairs should be limited to 18m in a single direction and 45m where alternatives are available. This is achieved from all the Basement areas.

The sections of Core A and B stairs serving the Basement discharge directly to outside independently from the sections serving the upper floor residential accommodation. This is shown in Figure 12 and Figure 13.

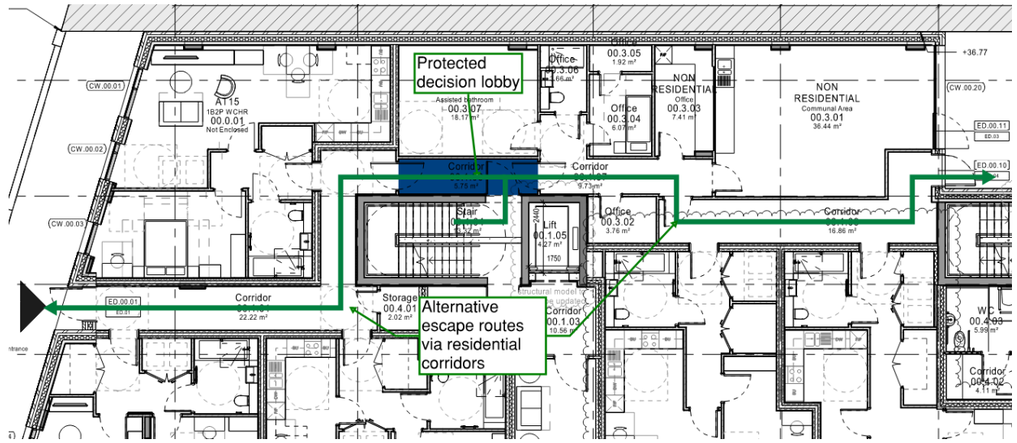


Figure 12 – Final Exits from Sections of Core A Serving Basement Level

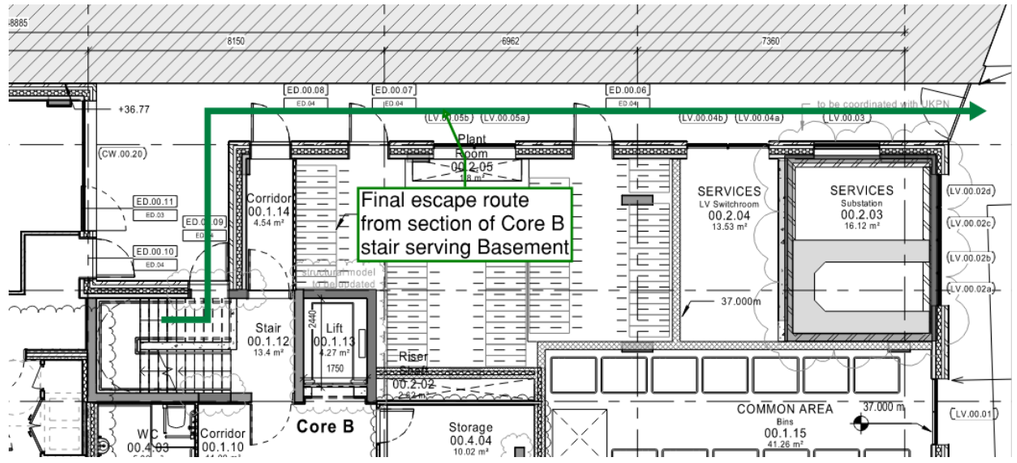


Figure 13 – Final Exits from Sections of Core B Serving Basement Level

The final escape route from the section of Core A serving the Basement level is available via either of the smoke vented common corridors serving the assisted evacuation apartments. A protected decision lobby is also provided at the exit from the stair to allow the escaping occupants to assess the situation and choose a suitable escape route.

The final escape route from the section of Core B serving the Basement level is available directly to outside and then along the external elevation of the building. Protection will be provided to this section of the elevation to enable this.

Ground Floor

There are multiple ancillary areas provided at Ground Floor level, such as assisted living office, bike storage and refuse storage, as well as plant rooms.

The travel distances from these areas will need to be limited to 18m in a single direction of escape and 45m where alternatives are available. This is achieved in all the ancillary areas.

Based on the ancillary area floor areas, the occupancy of all the ancillary areas is not expected to exceed 60 occupants at any one time. Therefore, provided escape capacity will be sufficient.

Majority of the ancillary areas will be accessed directly from outside independently from the rest of the building. However, the assisted living office will be accessed either directly from outside or via smoke vented common corridors serving the residential apartments.

This is considered reasonable as sprinklers will be extended to serve this area and due to the nature of the office occupancy being present to aid the occupants of the Ground Floor apartments, including with evacuation in the event of a fire.

Roof Plant

There will be a rooftop plant area accessible via a rooftop communal terrace provided at the Roof Floor level of Block B.

The BS 9991 guidance does not provide specific recommendations regarding the evacuation from rooftop plant areas open to outside. However, travel distances from the plant area to the Core B smoke vented protected lobby only exceed the single direction travel distance recommendation of 18m for internal plant rooms by around 1m, at 19m, as shown in Figure 14.

This is considered reasonable as the area will only be accessed sporadically for maintenance by trained personnel and will be largely open air, reducing the risk of occupants being affected by a fire or smoke.

The rooftop plant area will evacuate on detection of smoke within the protected smoke vented lobby, along with the communal terrace.

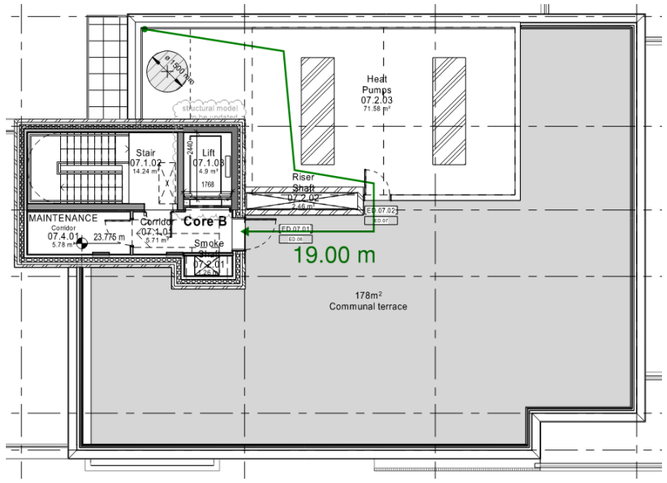


Figure 14 – Escape from the Rooftop Plant Area

4.2 SOCIAL ENTERPRISE AREA

4.2.1 Risk Profile

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

Occupancy Characteristic

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

The occupancy characteristic applicable to this building, as per Table 2 in BS 9999:2017, is noted in Table 1.

Table 1 – Occupancy Characteristic according to BS 9999:2017

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

Fire Growth Rate

The fire growth rate is the rate at which it is estimated that a fire will grow given the typical use of the building. The fire growth rate is categorised at 3, in accordance with Table 3, BS 9999:2017, as shown in Table 2. This can then be reduced by one category down to 2 due to the provision of sprinklers throughout the building.

Table 2 – Fire Growth Rate according to BS 9999:2017

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

Resulting Risk Profile

The risk profile is given as a combination of occupancy characteristic and Fire Growth Rate. Therefore, as shown in Table 3**Error! Reference source not found.**, the Risk Profile for the social enterprise area is B2.

Table 3 – Risk Profile Classification according to BS 9999

Occupancy Characteristic	Fire Growth Rate	Risk Profile
B	2	B2

4.2.2 Evacuation Strategy

The social enterprise area will evacuate independently from other building areas.

The evacuation strategy employed from the area is simultaneous evacuation, where the entire social enterprise area will be evacuated immediately on receiving an evacuation signal or instruction.

The fire alarm and detection system will signal the evacuation of the space on the activation of a single smoke detector, heat detector or manual call point. No acknowledgement or investigation period is provided.

4.2.3 Horizontal Means of Escape

Travel Distances

The travel distances within the social enterprise area should be limited to the distances noted in Table 4 in line with recommendations of BS 9999 guidance for B2 risk profile.

Table 4 – Travel Distance Limits

Measurement	Travel Distance in a Single Direction	Travel Distance where Alternatives are Available
Direct (before fit out)	13m	33m
Actual (after fit out is known)	20m	50m

The travel distances from the social enterprise area are within the limits outlined in Table 4, as shown in Figure 15.

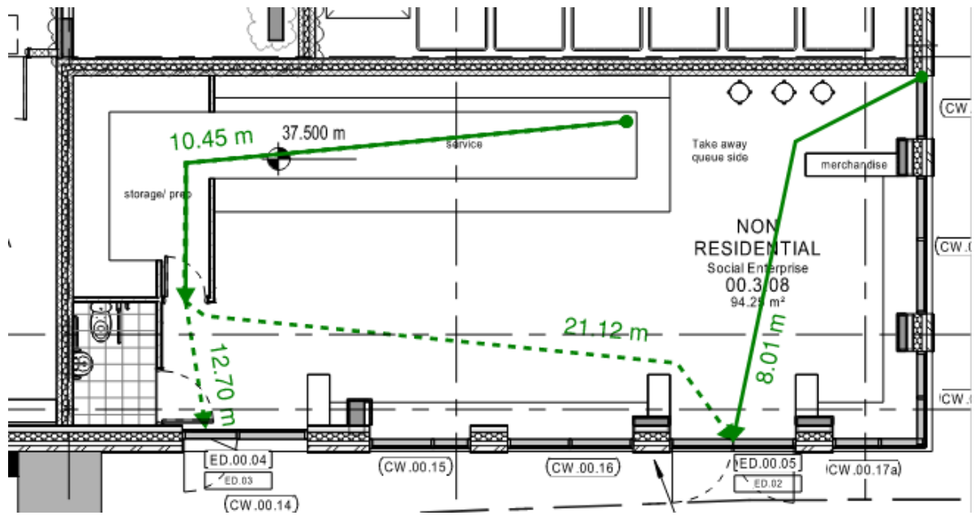


Figure 15 – Travel Distances within Social Enterprise Area

Horizontal Escape Capacity

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

$$N = W_e/m$$

where: N – number of persons safely accommodated by the door width

W_e – width of the exit, mm

m – minimum door width, mm/person

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

Based on a B2 risk profile, the minimum door width used for the assessment of the horizontal escape capacity provided was taken as 4.1mm/person.

Two exits are provided from the social enterprise area directly to outside. However, as the exits are located close together, they could be simultaneously discounted by the effects of a fire within the area. Therefore, the maximum occupancy of the social enterprise area would need to be limited to 60 occupants at any one time.

This can be increased provided that the exits can be located at least 10m from each other.

4.3 EVACUATION OF MOBILITY IMPAIRED OCCUPANTS

The occupants at Ground Floor level will be able to evacuate directly to outside via level escape routes.

At Basement level, the occupancy of the premises will consist of trained, able-bodied personnel due to the nature of the occupancy consisting of plant and services areas. Therefore, no specific provisions for evacuation of mobility impaired occupants are provided at this floor level.

For upper residential floors, lifts within both Core A and Core B will be designed as suitable for evacuation in line with guidance on the design of evacuation lifts provided within Annex G of BS 9999:2017, with lift in Core B also designed to be a firefighting lift.

While no designated refuge positions will be provided at upper floor levels, the occupants will be able to await evacuation either within the stair enclosure or within the protected smoke vented common corridors.

The above provisions have been discussed and agreed with Building Control.

4.4 FIRE DOORS AND ESCAPE DOORS

All doors used for means of escape on floors would measure a minimum clear width of 850mm if they are required to facilitate wheelchair occupants.

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

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

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

The clear widths of exit doors would, as a minimum, be required to meet the recommendations of BS 9999. Doors opening onto stairways or corridors would require to be sited so as not to encroach on the required effective width.

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

Vision panels would be provided in doors that open in both directions and within doors sub-dividing corridors on escape routes.

Fire door assemblies should comply with:

1) BS 476-22 or BS EN 1634-2 for fire resistance; and where applicable; and
2) BS 476-31 or BS EN 1634-3 for smoke leakage.

Flat entrance and communal fire doors would require test exposure from each side of the door set separately.

4.5 EMERGENCY LIGHTING

Emergency lighting would be required to be installed to provide temporary illumination in the event of failure of the primary power supplies to the normal lighting system. Adequate artificial lighting should be provided in all common escape routes.

Emergency lighting would also be installed in accordance with the recommendations of BS 5266 (parts 1-2 and 4-6). The system would be required to provide emergency lighting for 3 hours in the event of a mains power failure.

Emergency lighting installation would illuminate all internal circulation routes, refuse stores, plant rooms, all final exits from the buildings and firefighting equipment such as the dry rising main outlets where provided.

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

Table 5 – Escape Lighting

Purpose Group	Areas Requiring Escape Lighting
Office accommodation	1) All protected corridors and stairs
Residential	1) All common escape routes (including external escape routes)

Luminaires would require to be provided, appropriately spaced, to provide the light levels suggested within British Standard BS 5266, see Table 6.

Table 6 – Illuminance for Specific Locations

Location	Response Time (s)	Min Illuminance (lx)	Min duration (min)	Reference Plane
Defined escape routes	5	1	3 hrs	Centre line of the escape route
Undefined escape routes	5	0.5	3 hrs	Floor level excluding border of 0.5m around the perimeter of the room
Plant rooms, switch rooms and emergency winding facilities for lifts	5	15	3 hrs	In plane of visual task
Fire alarm control and indicating equipment	5	15	3 hrs	In plane of visual task
Reception areas	5	15	3 hrs	In plane of visual task
Security devices	5	5	3 hrs	Horizontal on plane of panic bar/pad; vertical at vertically mounted/wall mounted security devices

4.6 FIRE SAFETY SIGNAGE

All signage would meet the recommendations of BS ISO 3864-1, BS 5499-4 and BS 5499-5.

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

1) All designated escape routes or escape routes across open areas provided with signage, especially stairs and other changes in level and direction.
2) The position of all doors and other exits sited on escape routes, including storey exits and final exits will be identified by signs.
3) Where an escape route from a room is not conspicuous or confusion could occur, the route will be indicated by a sign, including intermediate signs where necessary.
4) All changes of direction in corridors, stairways and open spaces forming part of an escape route will be marked with intermediate signs. Each intermediate door or junction will be similarly signed.

Fire resisting doors in the common areas, excluding the entrance doors to apartments, would be signed with 'Fire Door Keep Shut' and riser doors would be signed with 'Fire Door Keep Locked'.

Firefighting equipment, including the ventilation controls and overrides in and around the building, would be provided with signage.

4.7 WAYFINDING SIGNAGE FOR THE FIRE SERVICE

To assist the fire service to identify each floor in a block of flats with a top storey more than 11m above ground level, floor identification signs and flat indicator signs should be provided. The floor identification signs should meet all of the following conditions:

- The signs should be located on every landing of a protected stairway and every protected corridor / lobby (or open access balcony) into which a firefighting lift opens.
- The text should be in sans serif typeface with a letter height of at least 50mm. The height of the numeral that designates the floor number should be at least 75mm.
- The signs should be visible from the top step of a firefighting stair and, where possible, from inside a firefighting lift when the lift car doors open.
- The signs should be mounted between 1.7m and 2m above floor level and, as far as practicable, all the signs should be mounted at the same height.
- The text should be on a contrasting background, easily legible and readable in low level lighting conditions or when illuminated with a torch.

The wording used on each floor identification sign should take the form Floor X, with X designating the number of the storey, as intended for reference by residents. The floor number designations should meet all of the following conditions:

- The floor closest to the mean ground level (see Diagram D4) should be designated as either Floor 0 or Ground Floor.
- Each floor above the ground floor should be numbered sequentially beginning with Floor 1.
- A lower ground floor should be designated as either Floor –1 or Lower Ground Floor.
- Each floor below the ground floor should be numbered sequentially beginning with Floor or Basement 1.

All floor identification signs should be supplemented by flat indicator signs, which provide information relating to the flats accessed on each storey. The flat indicator signs should meet all of the following conditions:

- The signs should be sited immediately below the floor identification signs, such that the top edge of the sign is no more than 50mm below the bottom edge of the floor identification sign.
- The wording should take the form Flats X–Y, with the lowest flat number first.
- The text should be in sans serif typeface with a letter height of at least half that of the floor indicator sign.
- The wording should be supplemented by arrows when flats are in more than one direction.
- The text and arrows should be on a contrasting background, easily legible and readable in low level lighting conditions or when illuminated with a torch.

5 ACTIVE FIRE SAFETY SYSTEMS

5.1 AUTOMATIC WATER FIRE SUPPRESSION

The building will be provided with a Category 4 sprinkler system throughout designed in line with BS 9251:2021 guidance.

This is to support the provision of open plan apartments, extended common corridor travel distances and extension of residential sprinkler system to serve non-residential areas.

5.2 AUTOMATIC FIRE DETECTION AND ALARM

The residential apartments will be provided with a Grade D1 LD1 standard automatic fire detection and alarm system in line with the BS 5839-6:2019+A1:2020.

The alarm systems within assisted living apartments will be connected to an alarm panel within the assistance staff office to alert them of a fire within the apartment and initiate assisted evacuation procedures.

An L5 standard of automatic fire detection and alarm will be provided within the common corridors and lobbies to activate smoke control provisions in line with BS 5839-1:2017. This will also be used to provide alarm to the communal terrace occupants, with sounders provided on the terraces alerting the terrace occupants of the access corridor being affected by fire.

Ancillary residential areas will be provided with L4(M) fire alarm system designed and installed in accordance with BS 5839-1 and BS EN 54-23: 2010 for visual alerting devices where installed.

The non-residential social enterprise area of the building will be provided with L4(M) fire alarm system as part of the basebuild design, designed and installed in accordance with BS 5839-1. This will need to be reviewed as part of the tenant fire strategy.

Consideration of unit location and decibel (dba) level should be given by the system designer to the potential for audibility spill-over to residences within likely sound levels of the external sounder unit.

5.3 BASEMENT SMOKE VENTING

BS 9991:2015 guidance recommends that a system of smoke and heat ventilation should be provided from every basement, except for any basement storey that has:

- A floor area of not more than 200m^2; or
- A floor level not more than 3m below the adjacent ground level

While the Basement floor area is within the 200m^2 limit, at app. 189m^2, the lowest point of the Basement level is 3.5m below the adjacent ground level.

However, it is not proposed to provide smoke venting to the Basement areas, based on the following:

- The basement areas will be enclosed in fire resisting construction achieving 120 minutes fire resistance with FD60S doors.
- Approximately half of the Basement floor area consists of a corridor area and the stair enclosures, which will not contain fire load, limiting the risk represented by the basement areas.

This has been discussed and agreed with Building Control.

6 INTERNAL FIRE SPREAD

6.1 INTERNAL LININGS

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

All wall and ceiling linings within the building should meet the recommendations of the table below when tested under either the National Classifications (in accordance with BS 476 part 7:1997) or under the European Classifications (in accordance with BS EN 13501-1:2002).

Table 7 – Classification of Linings

Location	European Class
Small room of area not exceeding 4m^2 in residential areas	D-s3, d2
Small room of area not exceeding 30m^2 in non-residential areas	
Other rooms (including garages)	C-s3, d2
Circulation spaces	B-s3, d2

Parts of the wall area in rooms may be of poorer performance than specified above, but not less / worse than Class D-s3, d2.

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

These should be maintained for the lifecycle of the building and manufacturer's guidelines should be followed with respect to maintenance and replacement of their products. Display features or items such as posters, artwork pieces, etc. may be included with appropriate consideration through risk assessment, justification and on-going control.

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

6.2 STRUCTURAL FIRE RESISTANCE

The building is a mixed-use building consisting of residential, ancillary residential and non-residential areas at ground floor, with two residential blocks above. The top floor heights above the adjacent ground level of the residential buildings are as follows:

- Block A – 16.68m
- Block B – 21.28m

The buildings are also provided throughout with sprinkler system designed in line with BS 9251.

Therefore, when tested in accordance with either BS 476 suite of standards or the relevant European Standard (BS EN 1364, 1365, or 1366), the elements of structure in both blocks should achieve 60 minutes fire resistance for loadbearing capacity (R).

The fire protection of the structural elements of the building will need to be maintained during fit out works for non-residential areas. Where the protection is affected or damaged during the fit out works, it will need to be reinstated.

6.3 COMPARTMENTATION AND FIRE RESISTING CONSTRUCTION

All the building floors will be designed as compartment floors as per requirements of BS 9991 for residential buildings.

The requirements for the provision of compartmentation and fire resisting construction, as well as associated fire doors, are shown in the Table 8.

Table 8 – Compartmentation and Fire Resisting Construction

Area	Fire Resistance Requirements	Exposure	Fire Doors
Compartment Floors	REI 60	From underside	-
Residential Apartment Enclosure	REI 60	From each side	FD30S
Common Corridors	REI 30	From each side	FD30S
Risers	REI 60	From each side	FD30S
Protected stair in Block A, including the final escape route	REI 60	From each side	FD30S
Section of Core A stair serving Basement floor	REI 60	From each side	FD30S
Lift Shaft in Block A	REI 60	From each side	FD30
Firefighting Shaft in Block B, including ground floor access routes	REI 120	From side remote from the shaft	FD60S
	REI 60	From shaft side	
Smoke vented Firefighting Lobby at Ground Floor of Block B	REI 120	From each side	FD60S
Separation between the Firefighting Stair and Firefighting Lift/Lobby	REI 60	From each side	FD30S
Section of Core B stair serving Basement floor	REI 60	From each side	FD30S
Storage Areas	REI 30	From each side	FD30
Plant Rooms	REI 60	From each side	FD30

Area	Fire Resistance Requirements	Exposure	Fire Doors
Bin Store	REI 60	From each side	FD60
Separation between residential and ancillary/non-residential areas	REI 60	From each side	FD60S
Enclosure of wheelchair charging areas	REI 30	From each side	FD30S
Enclosure of Basement areas	REI 120	From each side	FD60S
Enclosure containing life safety equipment or secondary power supply to life safety equipment	REI 120	From each side	FD120S
Substation	REI 240	From each side	FD120

- Period of resistance for Loadbearing (R), Integrity (E), Insulation(I)
- (S) denotes the inclusion of smoke seals on the fire door(s).
- Fire door sets to consist of a complete door set as defined by BS 8214: 2016. This includes door leaves, frames, cold smoke seals and closers where applicable.

6.4 FIRE STOPPING AND PENETRATIONS THROUGH FIRE-RESISTING CONSTRUCTION

Fire-stopping would 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 to achieve the same fire resistance as the separating elements.

Fire collars are required where any kitchen / bathroom duct vents pass through external structural framing system (SFS).

All pipes, ductwork and services passing through fire-resisting separations should either be enclosed in fire-resisting construction (i.e., shafts) of matching fire resistance or provided with fire dampers of matching fire resistance. Certain small diameter pipes require only fire-stopping around the pipe, dependent on pipe material and the type of fire-resisting barrier penetrated. Further information is available in Table 10 of BS 9991 and Table 31 of BS 9999.

Pipes that pass through a fire separating element should meet one of the following provisions:

Proprietary Seals

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

Restricted Pipe Diameter

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

Sleeving

A pipe of lead, aluminium, aluminium alloy, fibre-cement or UPVC, with a maximum nominal internal diameter of 160mm, may be used with a sleeving of non-combustible pipe. The opening in the structure should be as small as possible and provide fire stopping between the pipe and structure. The sleeve should extend no less than 1000mm on either side of the structure.

6.5 PROTECTION OF VENTILATION DUCTS AND FLUES

One of the following methodologies 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. It should be noted that fire dampers only are not suitable to protect escape routes, with actuated fire and smoke dampers required in these locations. They are also not suitable for ductwork serving kitchen extracts.
- Protection using fire-resisting enclosure achieving the fire resistance rating equivalent to the highest rated compartmentation it penetrates.

If dampers are chosen for stopping flame spread through the ductwork the type of damper required would be a fire damper. Fire dampers should be tested to BS EN 1366 Part 2: 1999 and be classified to BS EN 13501 Part 3: 2005. They should have an E classification equal to or greater than the element being penetrated.

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

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

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

6.6 CONCEALED SPACES

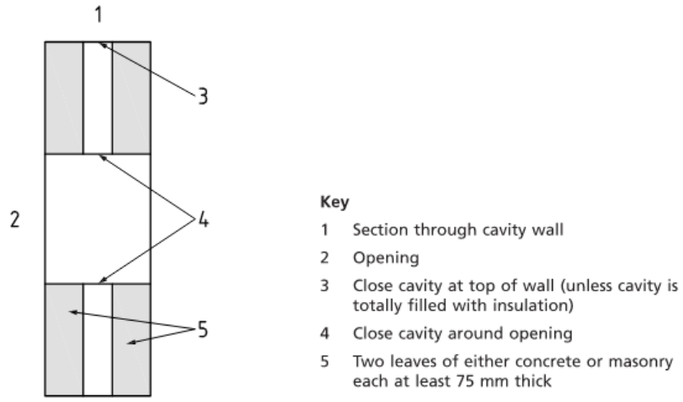
Cavity barriers would require to be provided to prevent the rapid spread of unseen fire or smoke in voids, and to prevent the spread of fire around compartmentation via voids and concealed spaces.

Concealed cavities (e.g., voids in partition walls, roof voids, voidS between suspended ceilings and the soffit of the floor above) would be provided with cavity barriers to sub-divide them as outlined within BS 9991.

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

Cavity barriers should achieve 30 minutes integrity fire resistance and 15 minutes insulation fire resistance.

Cavity barriers should be within the external wall cavity, positioned to align with the internal fire-resisting walls and floors, unless constructed in line with Figure 25 of the BS 9991:2015, presented in Figure 16 for ease of reference. Cavity barriers should also be installed to seal around any openings (windows or doors) in the external wall.



Key

1 Section through cavity wall
2 Opening
3 Close cavity at top of wall (unless cavity is totally filled with insulation)
4 Close cavity around opening
5 Two leaves of either concrete or masonry each at least 75 mm thick

NOTE 1 Cavities may be closed with a material that might not conform to the various recommendations in Table 3 for cavity barriers. The purpose of closing the cavity is to restrict airflow within the cavity.

NOTE 2 Cupboards for switch boards, service boxes, service panels, etc. may be installed provided that:

- *there are no more than two cupboards per compartment;*
- *the openings in the outer wall leaf are not more than 800 mm × 500 mm for each cupboard; and*
- *the inner leaf is not penetrated except by a sleeve not more than 80 mm × 80 mm, which is fire stopped.*

NOTE 3 Combustible materials may be placed within the cavity.

Figure 16 – Figure 25 of BS 9991:2017

7 EXTERNAL FIRE SPREAD

7.1 BUILDING SEPARATION

The building design must ensure that fire spread does not occur from one building to another, as such, external walls should be constructed as a fire rated wall. Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls.

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

External fire spread between adjoining building and site boundaries will be assessed using the Enclosing Rectangle Method detailed in BR 187 "External fire spread; building separation and boundary distances" published by the Building Research Establishment. In the method, a rectangle is drawn around the unprotected area which forms the façade of the compartment assessed; this area is called the "Enclosing Rectangle". A table then gives the minimum boundary distance for the size of the enclosing rectangle and the proportion of unprotected area associated.

The external fire spread calculations have been carried out using the enclosing rectangle and based on the following assumptions:

- The apartments will be separated from each other by 60 minutes fire resistance compartment wall and 60 minutes fire resistant compartment floor. The largest apartment/ancillary area on any level and / or the closest to the site boundary will therefore be used to undertake the external fire spread calculation. The radiation intensity at each unprotected area for apartments and assisted living office is assumed to be 84kW/m^2 as per guidance from BR187, with 168kW/m^2 radiation intensity used for other ancillary areas.
- The enclosing rectangle will be considered as the height and width of the apartment/ancillary area rather than only around the unprotected area (i.e., windows). This is an onerous assumption as it assumes that the walls will not provide any fire resistance.
- The height of the enclosing triangle has been assumed to be height of slab to slab and not slab to ceiling which also provides worst case scenario.

The Northwest elevation of the building faces the Greenwood Place, the Northeast elevation faces the Highgate Road and the Southeast elevation faces the adjacent site.

A section of the Southwest elevation is located on the site boundary, while the other faces the boundary. The section of the Southwest elevation located within 1m of the boundary will need to be fully fire protected.

Due to the provision of sprinklers throughout the development, the distance to the boundary can be double when assessing the allowed unprotected area.

The summary of the external fire spread assessment is presented in Table 9.

Table 9 – External Fire Spread Assessment

Elevation	Width, m	Height, m	Distance to Boundary, m [1]	Maximum Unprotected Area
Social Enterprise - Northwest	6.52	3.75	8.05 (16.1)	100%
Social Enterprise - Northeast	15.11	3.75	7.65 (15.3)	100%
Largest Apartment – Northwest	7.85	3.2	8.95 (17.9)	100%
Largest Apartment – Northeast	20.25	3.2	8.85 (17.7)	100%
Largest Apartment – Southwest	18.2	3.2	1.85 (3.7)	40%
Largest Apartment away from Boundary – Southwest	7.45	3.2	5.89 (11.78)	100%
Largest Apartment – Southeast	9.96	3.2	3.05 (6.1)	100%
Largest Ancillary Area - Southwest	10.35	3.75	2.07 (4.14)	60%
Largest Ancillary Area - Northwest	3.84	3.75	8.1 (16.2)	100%
Southwest Elevation <1m from Boundary	-	-	<1m	0%

Note [1]: The number in brackets is doubled due to the provision of sprinklers throughout the building.

External walls that are provided with the required fire resistance will be classed as protected area. Otherwise, that area will be counted as unprotected. The fire rating of the protected section of the external elevation that is more than 1m away from the notional boundary should be RE 60, I 15. For the protected sections of the external elevation that are within 1m of the notional boundary, they should be treated as a partition wall and should achieve REI 60.

A small, unprotected area on a wall close or on a boundary is allowed. The small, unprotected area is an opening not larger than 1000mm x 1000mm and located not closer than any other opening of similar size within 4.0m vertically or horizontally or an opening of 310mm x 310mm located not closer than 1.5m vertically and horizontally.

Walls achieving the required fire resistance but covered in a combustible material more than 1mm thick will be classed as having an unprotected area equal to 50% of their actual area.

7.2 EXTERNAL WALL CONSTRUCTION

As the building will contain apartments, the top floor height of Block B exceeds 18m above the adjacent ground level and both Blocks A and B share elevation construction, the external wall construction would require the following:

- No performance-based engineering solution
- No timber frame construction type
- Only concrete or adequately protected steel frame construction
- No combustible material as part of any external wall system and no combustible cladding or insulation.
- Balconies will not be formed or contain any amount of combustible material as a part of the construction aesthetic detailing.
- Only materials that achieve A1 or A2-s1, d0 performance, as defined through test to BS EN 13501-1, are permitted to be used on external wall systems and attachments.

The above requirement to achieve A1 of A2-s1, d0 performance excludes the following:

- Cavity trays when used between two leaves of masonry
- Any part of a roof (other than any part of a roof which falls within paragraph (iv) of Regulation 2(6)) if that part is connected to an external wall
- Door frames and doors
- Electrical installations
- Insulation and water proofing materials used below ground level
- Intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1
- Membranes, although they would need to achieve B-s3, d0 performance
- 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
- Window frames and glass

7.3 PROTECTION OF EXTERNAL ESCAPE ROUTES

There are several external escape routes from the building that pass along the Southwest elevation of the building, with the path narrower than 1.8m recommended by the guidance. Therefore, protection would need to be provided to protect the escaping occupants from the effects of a fire, as shown in Figure 17.

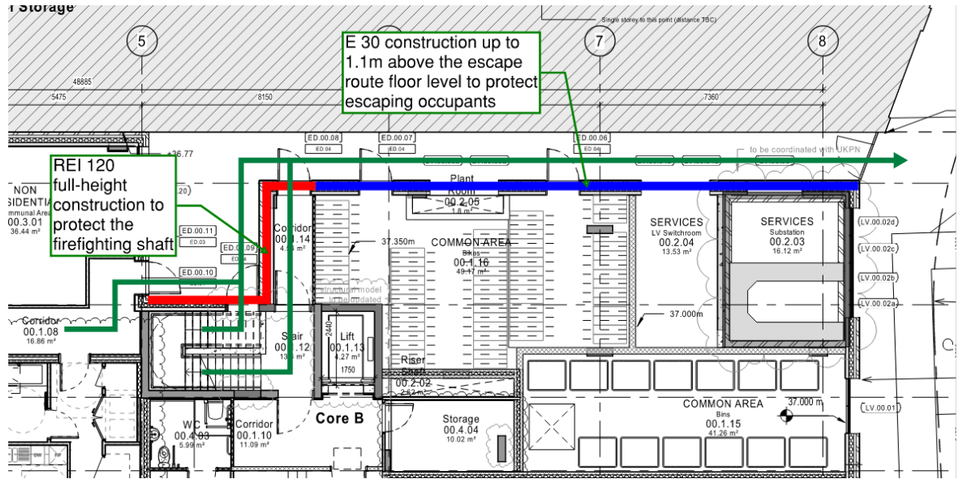


Figure 17 – Protection to External Escape Route

7.4 ROOF COVERING

The relevant test and classifications for the external fire performance of roof systems are BS 476-3 and BS EN 13501-5.

Roof coverings refer to a construction that can consist of one or more layers of materials but does not refer to the roof structure.

The roof covering fire performance requirements are as per Table 10 below.

Table 10 – Roof Covering Fire Requirements

Designation of Covering of Roof or Part of Roof	Distance from any Point of Relevant Boundary			
	Less than 6m	At least 6m	At least 12m	At least 20m
$B_{ROOF}(t4)$	Acceptable	Acceptable	Acceptable	Acceptable
$C_{ROOF}(t4)$	Not Acceptable	Acceptable	Acceptable	Acceptable
$D_{ROOF(}t4)$	Not Acceptable	Not Acceptable	Not Acceptable	Acceptable
$E_{ROOF}(t4)$	Not Acceptable	Not Acceptable	Not Acceptable	Acceptable
$F_{ROOF(}t4)$	Not Acceptable	Not Acceptable	Not Acceptable	Not Acceptable

8 ACCESS AND FACILITIES FOR FIRE AND RESCUE SERVICE

8.1 VEHICLE ACCESS TO AND AROUND THE BUILDING

The fire vehicle access is provided to the building via Greenwood Place and Highgate Road. The access routes for the pump fire vehicle should be in line with the recommendations in Table 11.

Table 11 – Fire Vehicle Access Route Design

Min Width of Road between Kerbs	Min Width of Gateways	Min Turning Circle between Kerbs	Min Turning Circle between Walls	Min Clearance Height	Min Carrying Capacity
3.7m	3.1m	16.8m	19.2m	3.7m	14 tonnes [1]

Note [1]: This has been increased from 12.5 tonnes to reflect LFPA Guidance Note, GN 29, which notes the minimum carrying capacities for London Fire Brigade appliances.

8.2 ACCESS INTO AND THROUGH THE BUILDING

8.2.1 Ground Floor

The Ground Floor areas will be accessed directly from external.

BS 9991:2015 allows to increase the hose coverage distances up to 90m from fire vehicle parking position to any point within an apartment that has no floor more than 4.5m above ground level, where provided with sprinklers in accordance with BS 9251. This would result in the hose coverage distances being within the recommendations of the guidance for Ground Floor apartment areas, as shown in Figure 18.

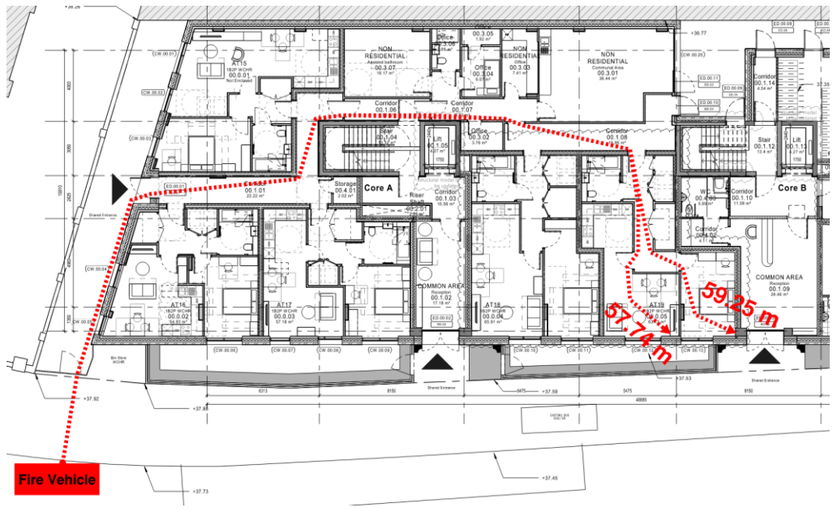


Figure 18 – Hose Coverage to Assisted Living Apartments

The hose coverage to non-apartment areas at Ground Floor would still need to be restricted to 45m from fire vehicle parking appliance. The hose coverage to the assistance office areas exceeds this at approximately 49.5m, as shown in Figure 19.

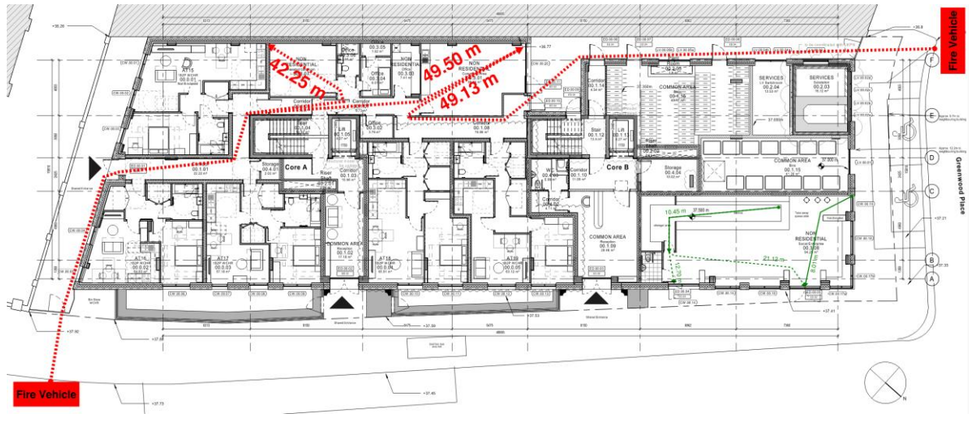


Figure 19 – Hose Coverage to Assisted Living Office

However, the extension of 4.5m is considered reasonable, as the building is provided with sprinklers throughout, which will control the fire size prior to the London Fire Brigade arrival and reduce the risk represented to firefighters. Additionally, access to the office area will be provided via two protected smoke vented corridors, providing firefighters with a relatively safe area to set up before accessing the office areas.

This should be discussed and agreed with both Building Control and London Fire Brigade.

8.2.2 Upper Floors

The top floor height of Block B above the adjacent ground level exceeds 18m, at 21.28m. Therefore, the Core B will be designed as a firefighting shaft, consisting of the following:

- Firefighting stair at least 1100mm wide
- Firefighting lift
- Dry fire main with outlets located within the stair at each floor level

As top floor height of Block A is below 18m, at 16.68m, Core A will not be designed as a firefighting shaft. However, a dry fire main will be provided within the Stair A enclosure serving all the upper floors.

All of the upper floor apartments will be within 45m from the dry fire main outlet in Stair A and within 60m from the dry fire main outlet in firefighting Core B.

The access into Stair A for firefighters will be provided via the common area, which will be maintained as a fire sterile area with fire resisting post boxes. However, access into the firefighting Core B will be provided via the common area containing the fire load. This is proposed on the following basis:

- this will ensure consistency of approach to both Blocks A and B and reduce potential for confusion when accessing the site, hence reducing the time required to begin firefighting operations.

- the firefighting shaft will be separated from the common area by a smoke vented protected lobby and an alternative escape route to outside is provided from the stair to the Southwest of the building.
- for a fire within the reception, firefighters will be able to fight fire directly from outside without having to access the stair, which will be protected from the effects of a fire by a smoke vented protected lobby. For a fire on other floor levels, access to the firefighting shaft would not be obstructed as the common area will remain unaffected, and it could be used as normal.

This should be discussed and agreed with both Building Control and London Fire Brigade.

8.2.3 Basement

The Basement area is accessible via both Stair A and Stair B sections serving the Basement.

However, due to the small size of the space and most of the fire load being located in the immediate vicinity of Stair B, it is not proposed to extend the dry fire main within Stair A to serve the Basement.

All basement areas will be within 45m from the dry fire main outlet within the Stair B enclosure. The access to the stair will be provided from the back of the property after connecting to the inlet at the Highgate Road entrance.

8.3 PROVISION OF HYDRANTS

Hydrants should be located within 90m of an entry point to the building and no more than 90m apart. The existing hydrant provisions should be confirmed by the design team.

9 SECONDARY POWER SUPPLIES

All life safety systems will be provided with secondary power supplies in accordance with BS 8519:2020.

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

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

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

10 FIRE SAFETY MANAGEMENT

10.1 REGULATORY REFORM (FIRE SAFETY) ORDER 2005

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

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

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

10.2 MANAGEMENT AND RESPONSIBILITIES IN SUPPORT OF THE FIRE STRATEGY

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

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

Inherent in fire strategy is the assumption that there will be appropriate fire safety management of the premises when in use. In accordance with BS 9999:2017, there are two management system levels, enhanced and adequate. Enhanced demonstrates a high level of assurance with a PAS 7 standard of management level. Adequate level of management demonstrates assurance which conforms with the requirements of legislation.

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

The appointed person should have the necessary authority and powers of sanction to ensure that standards of fire safety are maintained. The main duties of the Fire Safety Manager are as listed in BS 9999, but which are likely to be strengthened in the forthcoming Fire Safety Act (2020), include:

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

14) Ensuring that fire detection and protection systems are maintained and tested, and proper records are kept; and
15) Ensuring any close down procedures are followed.

Good fire safe housekeeping will be encouraged to ensure that the effectiveness of the fire safety provisions is not adversely affected. This should include adequate provision for the disposal of waste and / or rubbish. Where appropriate, these facilities should be emptied on a daily basis and the rubbish stored in a suitable area outside the building. Maintenance procedures should be developed to ensure that all equipment and services are able to operate effectively. Maintenance staff should be trained in the importance of the fire safety systems and planned maintenance programmes developed.

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

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

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

Where installed, fire points for fire extinguishers should be located at storey exits to ensure that coverage of at least one fire point containing a Water type and Carbon Dioxide type fire extinguisher for every 200m^2 of floor area. The type and size of fire extinguisher(s) at each fire point should be selected in accordance with BS 5306 guidance.

11 DRAWING SCHEDULE

Table 12 – Drawings Received

Drawing No.	Drawing Title	Rev.
HR-AHR-B1-B1-DR-A-20-0B1	Level B1 – Basement Plan	P3
HR-AHR-B1-00-DR-A-20-000	Level 00 – Ground Floor Plan	P4
HR-AHR-B1-01-DR-A-20-001	Level 01 – First Floor Plan	P3
HR-AHR-B1-02-DR-A-20-002	Level 02 – Second Floor Plan	P3
HR-AHR-B1-03-DR-A-20-003	Level 03 – Third Floor Plan	P3
HR-AHR-B1-04-DR-A-20-004	Level 04 – Fourth Floor Plan	P3
HR-AHR-B1-05-DR-A-20-005	Level 05 – Fifth Floor Plan	P3
HR-AHR-B1-06-DR-A-20-006	Level 06 – Sixth Floor Plan	P3
HR-AHR-B1-07-DR-A-20-007	Level 07 – Roof Plan	P3
HR-AHR-B1-ZZ-DR-A-20-101	GA North Elevation	P1
HR-AHR-B1-ZZ-DR-A-20-102	GA East Elevation	P1
HR-AHR-B1-ZZ-DR-A-20-103	GA South Elevation	P1
HR-AHR-B1-ZZ-DR-A-20-104	GA West Elevation	P1
HR-AHR-B1-ZZ-DR-A-20-320	GA Section A-A	P1
HR-AHR-B1-ZZ-DR-A-20-321	GA Section B-B	P1