

Brief

Orion has been appointed to support the client and architect in the development of a fire strategy for the proposed masterplan, which sets out a comprehensive vision for the redevelopment of a 24,777m² site to deliver a new residential neighbourhood. The illustrative scheme comprises approximately 652 new dwellings, arranged within a series of buildings ranging in height from 3 to 11 storeys.

As part of our appointment, Orion is required to provide commentary on the architectural general arrangement (GA) floor plans to assist the architect in incorporating fire safety recommendations into the evolving design. The primary objective of this early-stage input is to help mitigate the risk of significant design changes being required at a later stage due to fire strategy requirements, thereby supporting a robust and coordinated submission for the outline planning application.

These comments are intended as a design tool for the project team and are not required to be submitted as part of the outline planning application. They are provided to inform and guide the ongoing development of the scheme, ensuring that fire safety considerations are integrated from the earliest stages of the design process.

Description

Outline planning permission (with all matters reserved excluding access) is sought for demolition of existing buildings (above basement level) and delivery of residential development (Class C3), flexible residential / commercial floorspace, new public realm, landscaping, play space, car parking, cycle parking and associated works

The proposed redevelopment at Hyde Park, Hayes will deliver a high-density residential-led scheme across multiple blocks, incorporating commercial use at ground level and generous communal amenity space. The development comprises four primary blocks (A, B, C, and D), each with distinct sub-blocks, podium gardens, and varied building heights ranging from 3 to 11 storeys.

Block A1/A2 will front the primary street and deliver residential accommodation above ground-floor retail and ancillary uses. Block A1 will rise to 11 storeys (ground plus 10 upper storeys) and includes a retail unit that is fully separated from the residential core (circa. 150m² floor area). Four ground-floor dwellings will have direct external access. Block A2, at 8 storeys, will feature a large residential foyer and ancillary accommodation at ground floor. Both buildings will be served by two stair cores and associated lifts, with residential units accessed via internal corridors.

Block B comprises a cluster of three buildings—B1 (8 storeys), B2 (11 storeys), and B3 (6 storeys)—above a shared ground-floor covered car park and podium garden. Ancillary residential uses are located at ground level. B1 and B2 are each served by two stair cores, while B3 will have a single stair. Access to units varies, including direct external entrances at ground level and internal corridors or external decks above.

Block C consists of two mansion-style buildings (C1 at 10 storeys and C2 at 8 storeys), connected only at ground floor via shared entrance and ancillary spaces. Each building is served by two stair cores with associated lifts, providing residential accommodation across all floors.

Block D includes two primary buildings—D1 (8 storeys) and D2 (10 storeys)—linked by a series of three-storey townhouses. A shared podium garden provides communal amenity space, located above a ground-floor car park and ancillary areas. D2 buildings are each served by two stair cores, while D1 appears to operate as two single-stair buildings connected only at ground and first floors.

All blocks will incorporate secure cycle storage, refuse and recycling facilities, and dedicated residential access points. The proposed scheme aims to create a cohesive and vibrant residential neighbourhood, with a mix of building typologies, activated frontages, and well-integrated communal spaces.

Guidance Applied

The recommendations within BS 9991(2024) will be applied throughout the residential portions of the development. For industrial and other non-residential portions, the guidance within BS 9999 will be followed.

No client requirements beyond minimum compliance with Building Regulations have been implemented within this design. Where client/insurer/warranty requirements need to be incorporated into the design of the building this should be communicated to Orion Fire.

Evacuation Summary

Stay-put throughout the residential areas.

Simultaneous throughout the ancillary areas.

Simultaneous (independent) for the retail unit(s) and other non-residential spaces at ground floor level.

Evacuation Lifts and Temporary Waiting Spaces

An evacuation lift should be provided per stair core to comply with the recommendations of prescriptive guidance. The lift should meet the requirements outlined in BS 9991:2024, Annex G of BS 9999, as well as BS EN 81-20 and BS EN 81-70 (BS EN 81-76 when released). Indicative mark-ups have been provided within this document to illustrate how this could be achieved. One example is provided below in Figure 1 which is relevant to the proposed design of common escape routes within all blocks; A-D.

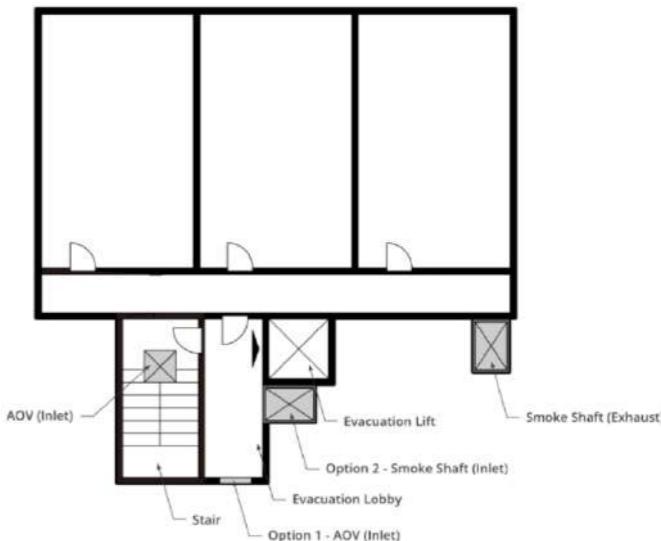


Figure 1: Smoke Ventilation Provisions that will be Required to Protect an Evacuation Lift Lobby

A lift landing with entrance into an evacuation lift should be provided with a temporary waiting space, which should be located within either an escape stair enclosure or lobby to the stair.

In line with BS 9991:2024 guidance, a temporary waiting space for non-ambulant occupants should be provided adjacent to evacuation lifts, with associated Emergency Voice Communication (EVC) system, positioned at least 500mm from any wall, as shown in Figure 1 below. There are a number of critical dimensions which need to be adopted for the temporary waiting space, including:

- The lobby in front of the lift should achieve a clear width of minimum 1500mm to the opposing wall.
- The lobby should achieve a clear horizontal length of minimum 2100mm. The above is achieved in the proposed design.

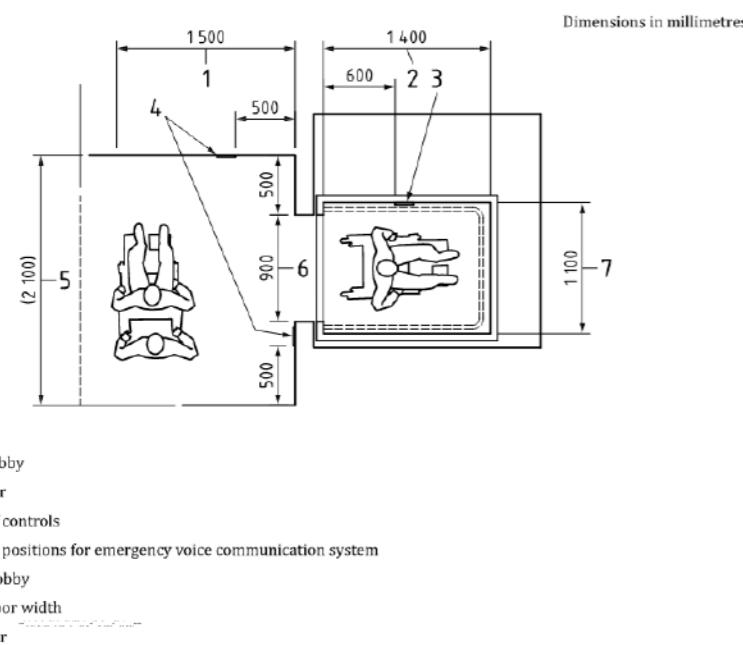


Figure 2: BS 9991 guidance for temporary waiting spaces

The walls of the lift landing and the temporary waiting space and the lift door, and the landing floor and lift door should contrast visually. A visually contrasting floor surface measuring 1500mm by 1500mm should be provided outside the lift door area to identify/demonstrate the location of the temporary waiting area.

Recommendations on protecting the evacuation lifts and temporary waiting spaces against smoke ingress - similar to the measures implemented for the stair - have been indicated in the markups provided.

Fire Detection and Alarm Systems

Residential Apartments: Grade D, Category LD2 to BS 5839-6, , upgraded to an LD1 standard for studio and open-plan layouts.

Common Escape Routes (Corridors and Stair Lobbies): Category L5 to BS 5839-1.

Ancillary Accommodation: Category L1 to BS 5839-1.

Non-residential Units: Category L1 to BS 5839-1.

BS 8629 evacuation alert control and indicating equipment (EACIE) systems should be provided for use by the Fire and Rescue Service in buildings with a top storey greater than 18m for manually alerting individual or multiple floors to evacuate, should the need arise during firefighting operations. There may be some blocks with a top storey less

than 18m above ground floor level, however, providing these systems through all blocks will be considered and discussed with the design team and Client in the next design stage.

Horizontal Means of Escape

Travel distances to be limited as follows:

- Apartments: 20m in a single direction where designed as open plan flats, or 9m along the protected entrance from the furthest habitable room to the flat entrance door.
- Common corridor single direction: 7.5m, increased to 15m if sprinklers are fitted and the corridor is provided with a smoke control system.
- Common corridor multiple directions: 30m, increased to 45m if sprinklers are fitted, and smoke ventilation is provided through the corridor.
- Deck access: Although there are no limitations on travel distances along balcony decks, all parts of the building need to be within 45 m of a fire main,
- measured along a route suitable for laying hose.
- Amenity spaces: 18m single direction or 45m where multiple directions of escape are available.
- Plant rooms/ bin stores/ cycle stores and other higher fire risk rooms: 9m single direction or 18m where multiple directions of escape are available.
- Retail unit(s) (A3 risk profile considered): 18m single direction or 45m where multiple directions of escape are available.

Note: where the fit-out is not specified, the direct distances have been used for the assessment on the drawing comments. The direct distance is taken as 2/3rd of the travel distance.

Where a single escape route is provided or the exit opens against the direction of escape, the occupancy will be limited to a maximum of 60 through that exit. Exit widths to areas with more than 60 persons will be detailed in the fire strategy report at RIBA Stage 2.

In open plan apartments, the position/siting of cooking hobs should achieve the separation distances illustrated in Figure 3 below. All egress routes adjacent to hob facilities in unenclosed kitchens should be at least 1.8m plus;

- 0.9m (the 0.9m excludes fixed obstructions such as radiators);

- 0.3 m should be provided between the leading edge of the door and the 1.8 m.

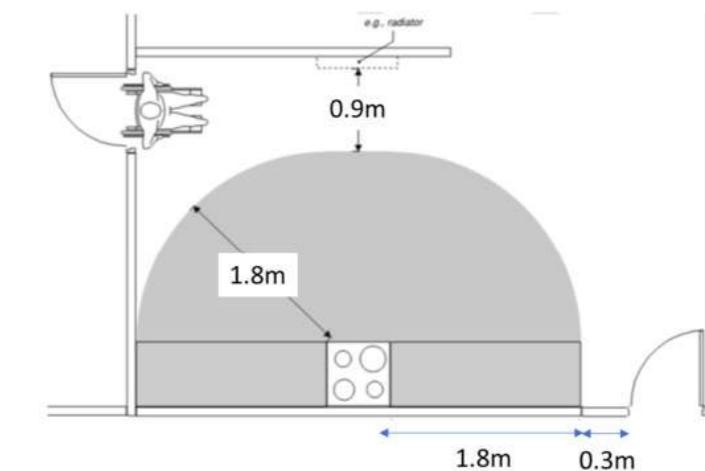


Figure 3: Hob Separation Distance

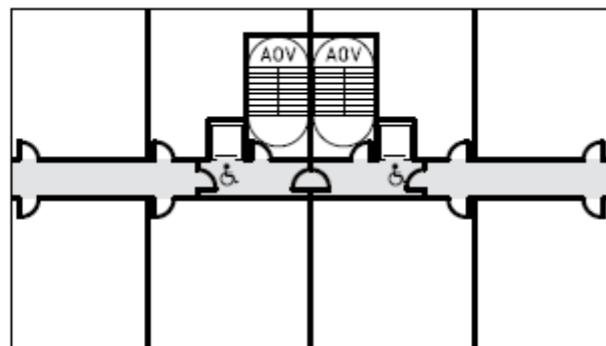
Smoke Ventilation Systems

An AOV at the head of each residential stair should be provided, achieving an aerodynamic free area of at least 0.7m².

Smoke ventilation for the common escape routes (stair lobbies and corridors) should be achieved through mechanical smoke extract shafts with a recommended cross-sectional free area of 1.0m². Early engagement with a smoke control specialist is strongly recommended to confirm the specific shaft requirements for the building.

The markups included in this document identify the lobbies and corridors that require smoke ventilation to align with the recommendations of BS 9991—specifically Figure 7(c) (see Figure 4) for internal layouts, and Figure 13 (see Figure 5) for deck access configurations.

In the markups, areas highlighted in light blue indicate locations requiring mechanical inlet ventilation (for replacement air), dark blue indicates mechanical smoke extract, and red represents locations where a combination of both systems is required. These provisions are intended to ensure protection of stair enclosures and final exit routes from smoke ingress during a fire event. Shaft locations will be discussed further and confirmed in the next design stage.



c) Example within stair lobby (stairs close together)

Figure 4: Figure 7(c) from BS 9991:2024

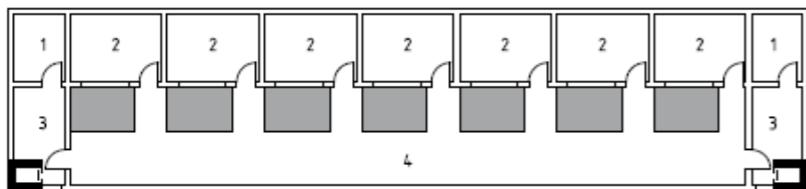


Figure 5: Figure 13 from BS9991:2024

Refuse room lobbies: 0.2m^2 permanent natural ventilation, or mechanical alternative.

Place of special fire hazard lobbies: 0.4m^2 permanent natural ventilation, or mechanical alternative.

Vertical Means of Escape

All residential stairs are to be sized to achieve a clear width at least 1,000mm between handrails. Firefighting stair within a firefighting shaft and therefore should meet the additional stair requirements for a firefighting stair (detailed under Fire Service Access). See also stair width requirements BS5395-1.

Protected stairways and evacuation lifts should discharge directly to a final exit, or into a protected corridor leading to a final exit. Any protected corridor leading to a final exit should have the same standard of fire-resisting enclosure and lobby protection as the stairway and/or evacuation lift that it serves.

The final exits from each of the stairs should be at least as wide as the stair and open in the direction of escape.

Where the exit passageways from two or more evacuation lifts or stairs providing alternative means of escape adjoin, they should be separated by

imperforate construction, i.e. there should be no openings (e.g. doors) in the separating element common to both passageways up until discharging from the building to the open air.

The final exit route from the stairs or lifts, leading to a place of ultimate safety outside the building, should provide a level egress. This is essential to ensure the design complies with accessibility and inclusivity requirements.

Where any storey, or part of a storey, requires more than one escape route, common stairs should be positioned such that occupants can access alternative stairs from any point without needing to pass through another stair enclosure. To comply with this principle and avoid reliance on a shared final exit route, each stair should be provided with an independent, protected route leading directly to the outside. The current design should be revised to address this requirement.

All common residential stairs are to be designed to meet the design requirements of Part K. This approach deviates from the guidance set out in BS 9991:2024; however, it is considered acceptable on the basis that Approved Document K is a recognised design standard in England. It is understood that the stair design referenced in BS 9991:2024 was developed to accommodate jurisdictions within the UK where Part K does not apply.

Sprinkler Systems

Residential sprinklers will be required throughout all residential Blocks. As all blocks are assumed to exceed 18m in height, a BS9251 Category 4 system will be required. Should the height of the top storey in Block B3 fall less than 18m, then a Category 2 system may be considered.

Retail spaces greater than 100m^2 , the covered car parks, and other residential ancillary spaces greater than 100m^2 will require BS EN 12845 compliant commercial sprinkler systems, with an OH3 hazard classification allowance. Extending the BS EN 12845 system to ancillary spaces within the residential areas should also be considered.

Particular consideration should be given to the presence of electric vehicles and the specific fire risks associated with battery fires, which may differ in severity and duration compared to conventional vehicles. It is recommended a minuted meeting is carried out with all stakeholders on whether the covered car park should be provided with an enhanced HHP3 sprinkler system under BS EN 12845, which is a common requirement from insurance and warranties.

Structural Fire Protection

The required structural fire resisting protection depends on the height of the top storey of each block. The table below outlines the required period of fire resistance for different top storey height thresholds in accordance with the recommendations of standard guidance.

Height of floor of top occupied storey above ground floor level	Minimum period of fire resistance, minutes
$\leq 5\text{m}$	30
$\leq 11\text{m}$	60
$\leq 18\text{m}$	60
$\leq 30\text{m}$	90
$>30\text{m}$	120

Structure forming part of a firefighting shaft to achieve 120 minutes.

Structure forming the enclosure to life safety plant to achieve 120 minutes fire resistance.

External Fire Spread

For the purposes of the fire safety design, all materials used within the construction of the external wall, for all blocks regardless of height, will achieve an A2-s1,d0 rating with the exception of items listed as exempt in Section 24.1 of BS9991:2024 and Regulation 7(3).

Where elevations are situated within close proximity to the site or notional boundary, there is a risk of fire spread from one building to another, and therefore portions of the external wall may be required to achieve a period of fire resistance to limit that risk. A high-level external fire spread assessment for specific areas has been provided within the mark-ups, however this is solely to raise awareness to the design team and a more detailed assessment will be undertaken in the next design stage.

Re-Entrant Corners

Where there is an internal angle between two facades, additional fire protection measures are required at that internal junction. The level of protection varies depending on the type of accommodation on each side of the internal angle which will be discussed in more detail in the next design stage.

Fire Service Access

Where any road to the development is to be newly constructed or amended as part of the works, it should be designed and constructed to

meet the requirements stated in the table below. Due to the location of the site being in a London Borough, the minimum carrying capacity should allow at least 14 tonnes as per recommendations from the London Fire Brigade (GN29: Access for Fire Appliances, 13th ed. 2020)

Appliance type	Min. width of road between kerbs m	Min. width of gateways m	Min. turning circle between kerbs m	Min. turning circle between walls m	Min. clearance height m	Min. carrying capacity t
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High-reach ^{a)}	3.7	3.1	26.0	29.0	4.0	17.0

^{a)} Because the weight of high-reach appliances is distributed over a number of axles, their infrequent use of a carriageway or route designed to 12.5 t is not likely to cause damage. It would therefore be reasonable to design the road base to 12.5 t, although structures such as bridges would be expected to have the full 17 t capacity.

At least one stair within each block will be provided as a firefighting shaft. There should be access to at least two firefighting shafts where the area served by the shafts is 900m² or more.

Firefighting shafts should be provided with the following:

- 1,000mm clear width within the stair.
- A protected ventilated lobby adjoining the stair (smoke ventilation options have been provided in comments above and annotations on the drawing comments)
- 0.7m² (aerodynamic free area) AOV at the head of the stair
- A firefighters lift within 7.5m of the stair door
- Dry rising fire main (wet riser required should any block exceed 50m above ground floor level).

Firefighting shafts should serve every storey through which they pass. The firefighting stairway should serve every storey that is served by the firefighters lift.

Dry fire mains should be provided within each residential stair core. Fire main inlet points should be within 18m of a suitable parking location for a fire appliance and clearly visible from that parking point.

Landing valves (i.e., outlets) for the rising fire mains should be provided at every level, including ground floor and basement level. Hose laying distance to the furthest point on floor plate should not exceed 45m (or 60m where measured from a firefighting shaft). This appears to be achieved on the current drawings.

Non-residential and ancillary areas on the ground floor are to be provided with a minimum of 15% perimeter access. Alternatively, any part of the building that is not fitted with fire mains should allow access for a fire appliance to within 60m of all points within the space, measured on a route suitable for laying hose.

A fire hydrant should be provided within 90m of each rising main inlet serving the building and each commercial unit entry point. Hydrants should not be less than 6m away from the building to minimise the risk of falling debris impacting them being used by the Fire Brigade. Where no fire hydrant is located within 90m, additional fire hydrants would be required.

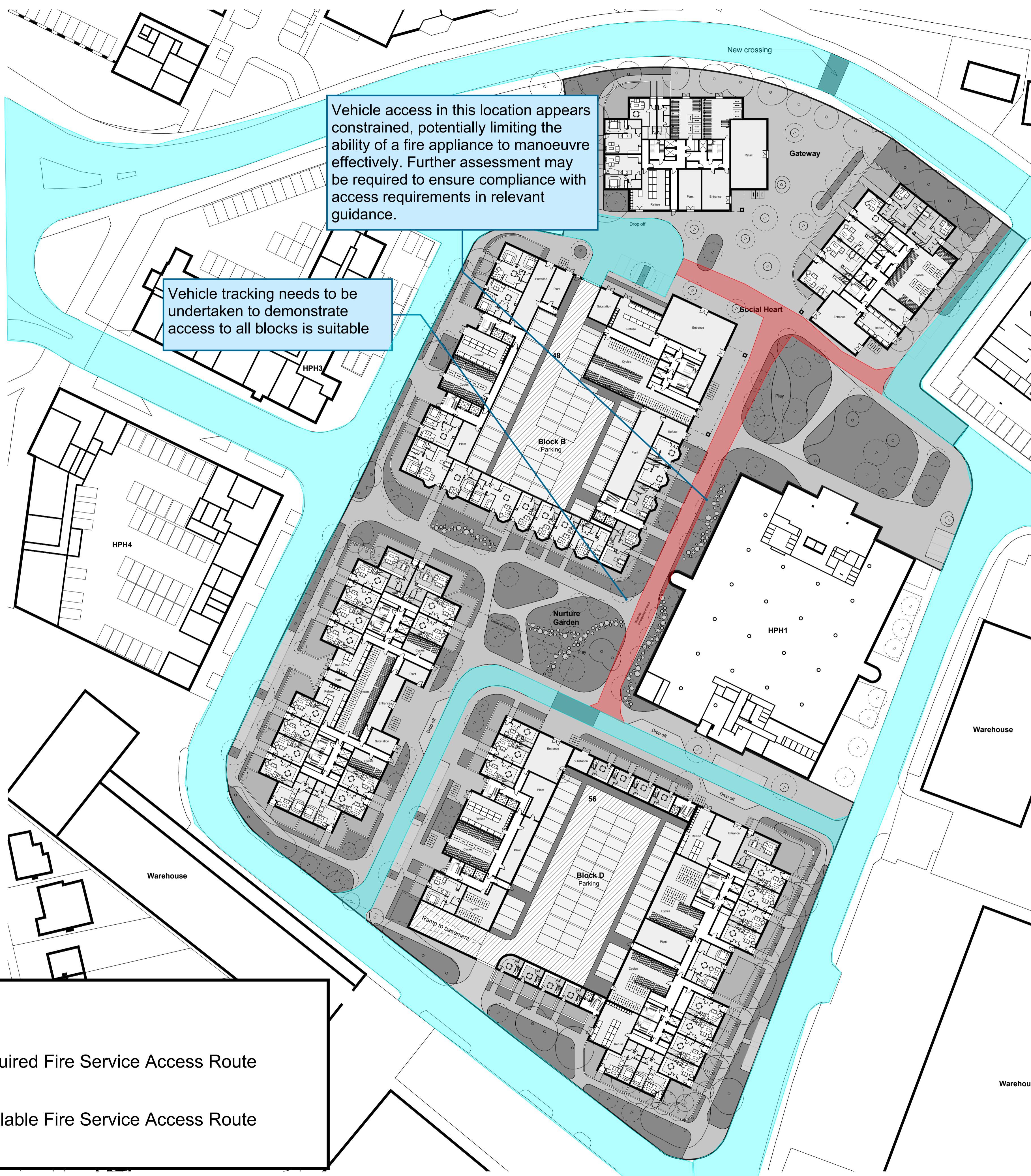
Secondary Power

Secondary power will be required to all life safety systems. It is recommended an allowance is made for a life safety generator. If the plots are to be owned/managed by different entities, independent secondary power systems would be required.

Requests for Further Information

1	Confirm if there are any additional fire safety requirements applicable to the scheme above and beyond the relevant Building Regulations requirements, for example, employer's requirements, insurer/funder requirements, warranty provider requirements
2	Building management (on-site presence of staff/staffing hours) should be confirmed by client to support the evacuation lifts.
3	The structural system that will be adopted for the blocks should be confirmed. Where multiple structural systems are adopted, confirm locations of the various structures.
4	Provide a utilities survey for the site and confirm locations of surrounding fire hydrants.
5	Confirm the location of the generator.
6	Confirm the location of the sprinkler tank infill points.
7	Confirm the required additional fire service vehicle routes are possible
8	Provide a full set of architectural GA plans, Sections and Elevations.

Fire Service Access Provisions



Access Road

Any road to the development that is to provide fire service access to the building should meet the requirements stated in the table below. The London Fire Brigade has specific requirements for vehicle access, including minimum road widths, turning circles, and headroom, as outlined in their Fire Safety Guidance Note GN29.

Appliance type	Min. width of road between kerbs m	Min. width of gateways m	Min. turning circle between kerbs m	Min. turning circle between walls m	Min. clearance height m	Min. carrying capacity t
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High-reach ^{a)}	3.7	3.1	26.0	29.0	4.0	17.0

^{a)} Because the weight of high-reach appliances is distributed over a number of axles, their infrequent use of a carriageway or route designed to 12.5 t is not likely to cause damage. It would therefore be reasonable to design the road base to 12.5 t, although structures such as bridges would be expected to have the full 17 t capacity.

Due to the location of the site being in a London Borough, the minimum carrying capacity should allow at least 14 tonnes as per recommendations from the London Fire Brigade (GN29: Access for Fire Appliances, 13th ed. 2020)

The height and width of the opening into the enclosed courtyard is to be confirmed to align with the recommendations above for a high reach appliance. Site photos indicate the passage may be blocked by parked vehicles. To address this, a management strategy should be implemented, along with an agreement with neighbouring building tenants, to ensure the space remains clear and accessible for emergency services.

Turning Facilities

Turning facilities must be provided for any dead-end access route exceeding 20m in length. Additionally, fire appliances should have access to the building within 18m of their hard-standing location.

Fire Mains

Both of the following should be met in buildings fitted with a dry fire main:

- Access should be provided for a pumping appliance to within 18m of each fire main inlet connection point. Inlets should be on the face of the building.
- The fire main inlet connection point should be visible from the parking position of the appliance, and meet the provisions in Section 8 of BS 9990.

Hose laying distances from the fire main outlet in the escape stair to the furthest points of a floor plate should not exceed 45m (permitting up to 60m to the furthest point from firefighting shafts).

Fire Hydrant

A fire hydrant should be located within 90m of all fire main inlet points and within 90m of an entrance of a building not fitted with a fire main. Orion Fire Engineering will contact the local Fire and Rescue Service for further information on existing hydrant locations (if any).

Firefighting facilities

Firefighting facilities, including firefighting lifts, stairs, and lobbies, should be incorporated within protected firefighting shafts where the height of the top storey exceeds 18m above ground floor level.

UB3 4AZ

Drawing Title
Illustrative Masterplan
Level 00

Drawn Date Scale @ A1
SC 11/20/24 1:500
Project Originator Volume Level Type Role Number Suitability Revision
A12440 TPB ZZ L00 DR A 041001 S2 P04

Block A1/A2 Fire Safety Advice

Height:

The exact building height has not been confirmed within the information provided. Therefore, it is assumed that the floor-to-floor height is approximately 3.0m. Therefore, the height of the top storey (above ground floor level) for Block A1 and A2 is approximately 33m and 24m respectively.

Internal Flat Layouts:

See Page 11.

Alarm and Detection:

Residential dwellings should be provided with at least an LD2 fire detection and alarm system, designed and installed in accordance with BS 5839-6, upgraded to an LD1 standard for studio and open-plan layouts. Common corridors should be provided with an L5 detection system, designed to operate the proposed smoke ventilation systems only (designed and installed in accordance with BS 5839-1). All other non-residential and residential ancillary/amenity spaces should be provided with at least an L3 system to BS 5839-1.

Period of Fire Resistance:

In accordance with standard guidance a minimum of 120 minutes fire resistance is required for elements of structure within Block A1, and 90 minutes fire resistance for structure within Block A2.

Structure forming part of a firefighting shaft to achieve 120 minutes.

Sprinklers:

Based on the height of the blocks, sprinkler protection should be provided throughout, designed and installed in accordance with BS 9251:2021. Non-residential and residential ancillary/amenity spaces with a floor area greater than 100m² should be provided with a commercial sprinkler system, design and installed in accordance with BS EN 12845.

Firefighting Provisions

Based on the top storey heights of Blocks A1 and A2 exceeding 18m above ground, firefighting shafts should be provided with the following:

- 1,100mm clear width within the stair,
- A protected ventilated lobby adjoining the stair,
- 1.0m² AOV at the head of the stair,
- A firefighters lift within 7.5m of the stair door,
- Dry rising fire main.

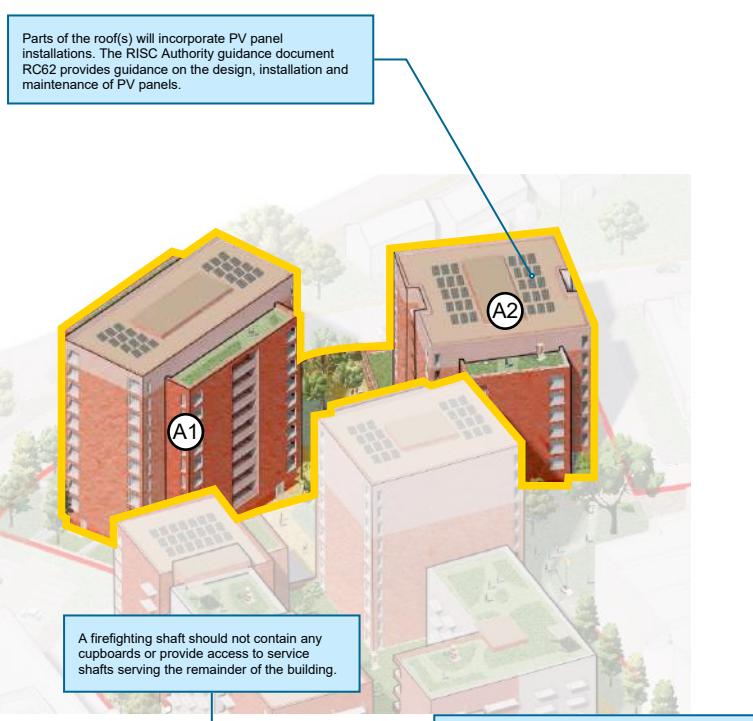


Fig.1 Block A1/A2 Massing

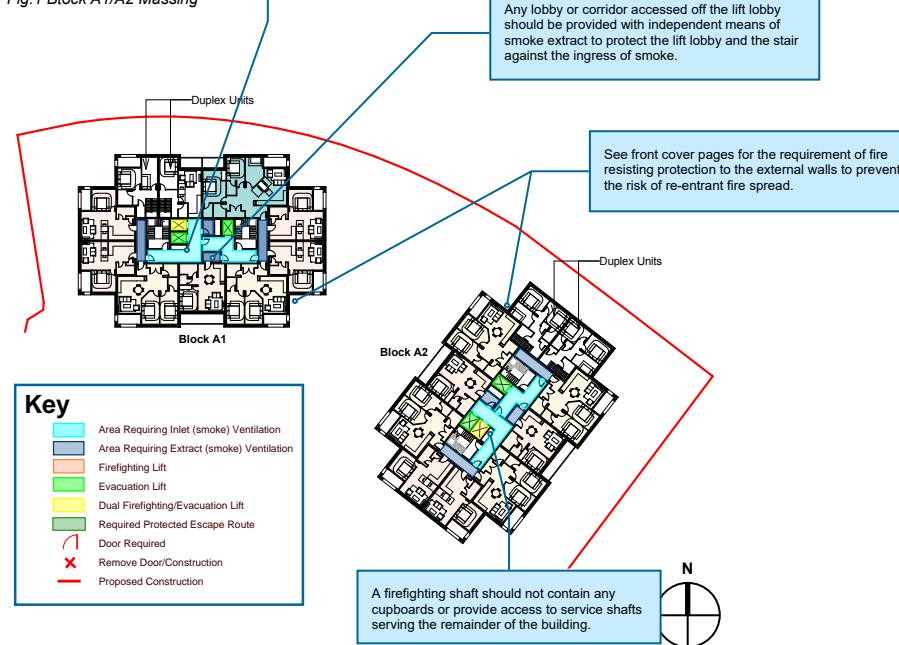


Fig.2 Block A1/A2 Typical illustrative plan

Smoke Ventilation:

The smoke ventilation strategy should be designed on the basis that the lift lobby/firefighting lobby is provided with a vertical shaft that supplies replacement air via mechanical inlet (typically 1m²), while mechanical extract shafts should be provided towards the remote ends of the corridors to draw the fresh air and remove smoke, directing it away from the lift/firefighting lobby. The system should be designed so that the extract fans adjust dynamically, responding to pressure changes within the corridor.

When the door between the lift lobby and the corridor is open, pressure equalisation between the two zones causes the fans to ramp up. Whereas, when the door is closed, a negative pressure is created in the corridor, prompting pressure sensors to signal the fans to ramp down until the doors are reopened. This design helps to maintain stable and regulated pressures within common areas, avoiding irregularities that could compromise safety.

Location, size and required extract rates for the smoke shafts should be discussed and developed further in the next design stage.