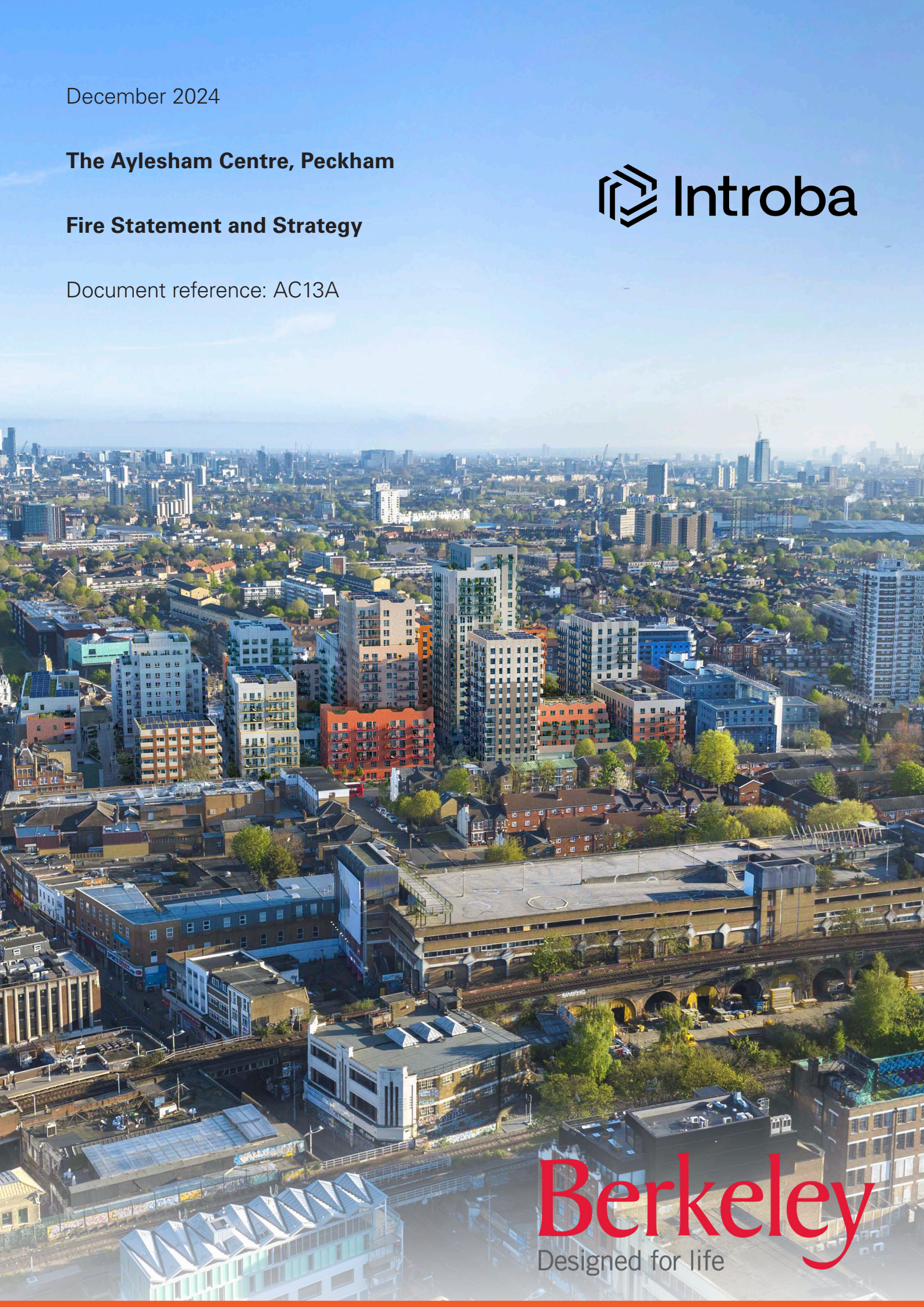


December 2024

The Aylesham Centre, Peckham

Fire Statement and Strategy

Document reference: AC13A



Berkeley
Designed for life

Aylesham Centre

FIRE STATEMENT AND STRATEGY

December 2024



Document reference: AC13A

Document reference: AC13A
Introba reference: 10246.000

Issue	Description	Date	Prepared By	Signed Off
P00	-	11/07/2024	CH	AB
P01(A)	Incorporating updated layouts*	06/12/2024	CH	AB

* Note: All changes from the previous revision have been highlighted by a line along the right-hand margin as shown here as an example.

Project Office:

Introba
150 Holborn
London EC1N 2NS
United Kingdom
+44(0)203 697 9300

Project Contact:

Cheri Ho
Cheri.ho@introba.com

Andy Baker
Andy.baker@introba.com

Simon Burch
Simon.burch@introba.com

Disclaimer

The information contained in this report may contain confidential or legally privileged information. It has been prepared for the sole benefit of our client and can only be relied upon only for its intended use. Introba do not confer or purport to confer on any third party, any benefit or any right to rely upon or use any part of this report. Copyright of this document remains with Introba.

© Introba 2024

Table of Contents

1	Introduction	5
1.1	Scope.....	5
1.2	Building Description.....	5
1.3	Fire Strategy Overview	7
1.4	London Plan – Policy D12 Fire Safety Statement	7
2	Legislation	10
2.1	Building Regulations 2010.....	10
2.2	Approved Document B (ADB)	10
2.3	Regulatory Reform (Fire Safety) Order	10
2.4	The London Plan 2021	11
3	Means of Warning & Escape	12
3.1	Evacuation Strategy.....	12
3.2	Travel Distances.....	12
3.3	Escape within Residential Accommodations	13
3.4	Escape within Residential Amenity	29
3.5	Escape within Ancillary Accommodations.....	34
3.6	Escape within Commercial Accommodations	37
3.7	Disabled Evacuation.....	40
3.8	Fire Alarm & Detection System.....	41
3.9	Emergency lighting.....	42
3.10	Signage.....	42
4	Internal Fire Spread (Linings)	43
4.1	Surface Linings.....	43
5	Internal Fire Spread (Structure).....	44
5.1	Fire Resistance of Elements of Structure	44
5.2	Compartmentation.....	45
5.3	Fire Stopping	47
5.4	Cavity barriers.....	47
5.5	Sprinklers.....	47
6	External Fire Spread	49
6.1	Unprotected Areas	49
6.2	External Wall Construction.....	49
6.3	Roofs	50
7	Access & Facilities for the Fire Service	51

7.1	Vehicle Access	51
7.2	Internal Fire Service Access.....	52
7.3	Wet / Dry Risers	53
7.4	Hydrants	54
7.5	Emergency Power Supplies.....	54
7.6	Firefighting Lifts	55
7.7	Evacuation Alert System	55
7.8	Secure Information Boxes.....	55
8	Fire Safety Management.....	56
8.1	General	56
8.2	Key Management Issues.....	56
8.3	Regulation 38	57
9	Conclusions and Recommendations	58
10	Appendix A – Qualitative Design Review	59
10.1	Introduction	59
10.2	Legislation	59
10.3	QDR Process.....	61
10.4	Review of Architectural Design.....	62
10.5	Functional objectives	66
10.6	Identify Fire Hazard and Possible Consequences	66
10.7	Establish Trial Fire Safety Designs.....	67
10.8	Set acceptance criteria.....	74
10.9	Identify Method of Analysis	74
10.10	Establish Fire Scenarios for Analysis.....	74
10.11	Conclusions and Recommendations	76
11	Appendix B – Gateway One Fire Statement	i

1 Introduction

This updated Fire Statement and Strategy is prepared by Introba for Berkeley Homes (Capital) Plc and submitted in support of the planning application (ref. 24/AP/2074) which seeks permission for the comprehensive redevelopment of the Aylesham Centre and associated car park and petrol filling station at Hanover Park, London SE15 5EW ('the Site'). This updated Fire Statement and Strategy supersedes the July 2024 Fire Statement and Strategy (document ref. AC13).

The updated Fire Statement and Strategy reflects the design changes as set out within the updated Design and Access Statement (document ref AC02A). The updates within this Report are minor and mainly comprise the following:

- Escape within Apartments in Section 3.3.2;
- Balcony approach in Section 3.3.3.1; and
- Updated layouts.

The conclusions are unchanged from those as set out within the July 2024 Fire Statement and Strategy (document ref. AC13).

This Fire Statement and Strategy for the Aylesham Centre Development shall be read in conjunction with the Qualitative Design Review (QDR) and the Gateway One Fire Statement which have been included in Appendixes A and B respectively.

The following sections outline the key fire safety features that should be incorporated within the development. Some of the requirements may be negotiated down at a later date following discussion with the approving authorities.

1.1 Scope

The fire strategy that has been developed at RIBA Stage 2 will be developed further as the project progresses. This document is intended for discussion between the design team and to assist the design team in developing the layouts to ensure that once a Building Regulations application is made, all of the fire safety elements will be incorporated into the plans.

This report is based on the guidance in Approved Document B (ADB), 2020 edition incorporating the 2022 and 2024 amendments.

This guidance has been developed to ensure the highest standard of fire safety is designed into the building development at an early stage of design.

Consideration has also been given to the Building Safety Update provided by DLUHC on the intention that residential buildings over 18m in height shall require to be provided with two stairs.

The London Plan dated March 2021 has been considered during the development of this fire statement and strategy as the London Plan is legally part of each of London's Local Planning Authorities' Development Plan and proposed developments within Greater London must be in accordance with it unless material considerations indicate otherwise. Planning applications should be determined in accordance with it, unless there are sound planning reasons (other material considerations) which indicate otherwise.

1.2 Building Description

The development consists of demolition of existing buildings and phased redevelopment to provide a replacement supermarket and associated service yard and car parking (Use Class E(a)); flexible retail, leisure (including drinking establishment), and commercial accommodation (Use Class E/Sui Generis); dwellings (Use Class C3); landscaping; and associated works.

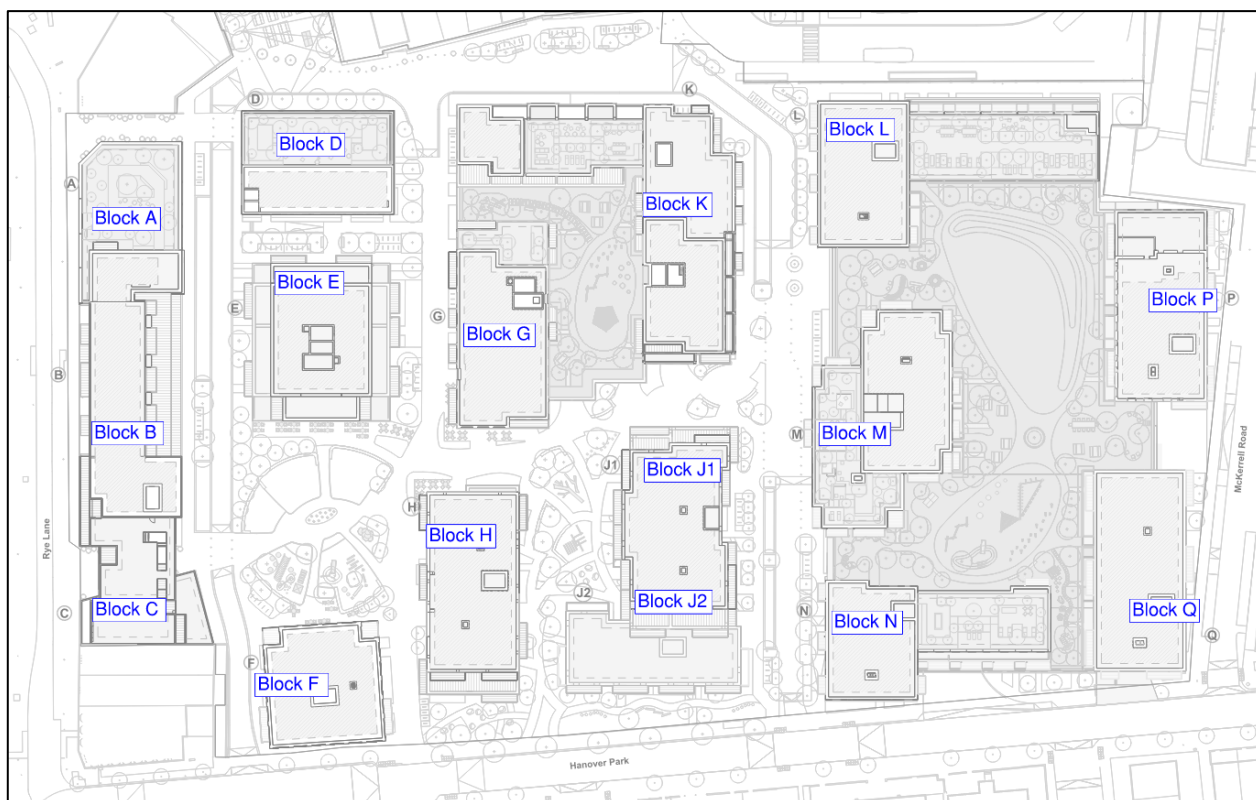


Figure 1 – Sitewide plan of the development

The following table provides information on the number of storeys and storey height of each building, in accordance with ADB:

Building	Number of Storeys	Top Storey Height (m)
Building ABC	Ground + 6	21.17m
Building D (Office)	Ground + 5	21.30m
Building E	Ground + 10	33.85m
Building F	Ground + 5	17.10m
Building G	Ground + 11	37.15m
Building H	Ground + 8	26.88m
Building J1	Ground + 15	49.43m
Building J2	Ground + 5	16.20m
Building K	Ground + 9	31.51m
Building L	Basement, Ground, Upper Ground, Mezzanine + 9	33.25m
Building M	Basement, Ground + Mezzanine + 19	64.35m
Building N	Basement, Ground + Upper Ground + 11	38.55m
Building P	Basement, Ground + Upper Ground + 10	36.40m
Building Q	Basement, Ground + Upper Ground + 4	16.70m

Table 1 – Building descriptions

1.3 Fire Strategy Overview

The proposals outlined in this document demonstrate a level of fire safety equal to or greater than the general standard implied by compliance with the recommendations of the ADB. This level of safety therefore satisfies the functional requirements of the Building Regulations relating to fire safety.

The fire strategy described in this report can be summarized as follows:

- Means of escape will be based on each apartment evacuating independently. The residential amenity spaces, commercial accommodations, ancillary areas and car park will each have independent means of escape and shall implement a simultaneous evacuation strategy.
- Generally, travel distances and escape widths are acceptable apart from some common areas of the residential accommodation, which contain extended travel distances. A system of smoke clearance via a Mechanical Smoke Ventilation System is proposed for all blocks, which shall mitigate the extended travel distances.
- The fire alarm systems within the development will be.
 - Within apartments – LD1 for open plan apartments
– LD2 for duplex units
 - Common Corridor – L5
 - Residential Amenity Spaces – L3
 - Ancillary Areas – L3
 - Car park – L5
 - Office / Workspace Units – Manual
 - Supermarket Office – Manual
 - Supermarket Sales Area – Manual
 - Supermarket Service Yard – L5
 - Other Commercial Units – Manual
- Structural fire protection will be provided in accordance with Table B4 of ADB. Each floor will be designed as a compartment floor.
- Sprinkler coverage is provided to the residential apartments and could be extended to cover the ancillary areas and residential amenity space where these accommodations do not exceed the areas within Table 4 of BS 9251:2021. All commercial accommodations will be provided with sprinklers in accordance with BS EN 12845.
- Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. All other blocks (except Buildings F, J2 and Q) exceed 18m in height but do not have a floor area over 900m², therefore these blocks will be provided with one firefighting shaft.
- For internal fire facilities, Block M is over 50m in height, therefore it will be provided with a wet riser in the firefighting shaft. Buildings F and Q do not require a firefighting shaft, however, dry risers will be provided in these buildings to satisfy the hose laying distances. For all other blocks, they will also be provided with dry risers in the firefighting shafts. The Supermarket and other commercial units on the ground and ancillary accommodations accessed from the ground level will be provided with access to either at least 15% of the perimeter of the unit, or 45m hose coverage to the furthest point of the floor plate from the parking of the fire tender.

1.4 London Plan – Policy D12 Fire Safety Statement

This section addresses Policy D12 for fire safety as part of the compliance with the London Plan.

1.4.1 Declaration of Compliance

In the interests of fire safety, the proposed technical design content produced for the planning application complies with all the relevant legislation and requirements of London Plan Policy D12 and D5(B5) as summarised in the following sections.

1.4.2 Competency and Qualifications of Assessors

The authors of this report comply with Section 3.12.9 of Policy D12 of the London Plan and Section 5.2.3 of the London Plan Fire Safety Guidance as outlined below.

Cheri Ho – Fire Engineer

Cheri Ho is a Fire Engineer with 3 years' experience and is an Associate Member of the Institution of Fire Engineers (IFE). She has detailed knowledge of Approved Document B (ADB) and BS 9991 and a good understanding and experience of mixed-use residential developments including early stage and construction design stages. She has worked on many similar schemes in the past, incorporating elements such as smoke control and firefighting facilities into designs, as well as experience working on buildings over 18m in height.

Andy Baker – Associate Fire Engineer

Andy has over 15 years' experience working as a designer/consultant within the fire life safety sector. He has extensive experience designing solutions for high- and low-rise residential developments, commercial properties including high rise offices, warehousing, and retail spaces as well as enclosed and multi-level underground car parks.

He has worked on many projects applying guidance from Approved Document B and the British Standards from conception to completion and is also a qualified Fire Risk Assessor.

Simon Burch – Director

Simon is a Director at Introba, registered with the Engineering Council and a Member of the Institution of Fire Engineers (MiFireE) with a wealth of experience on a variety of high-rise residential developments for major housing clients across London and the South-East. He is the lead author of fire strategies and responsible for all stages of the fire engineering design from the initial client contact through the tendering phase, across construction and the ongoing management and maintenance of fire safety systems and passive fire protection.

1.4.3 The Building's Construction Method and Products and Materials Used

Structural fire protection will be provided in accordance with ADB. Each floor will be designed as a compartment floor. Further information is provided in Sections 5.1 and 5.2.

All materials within the external wall construction of the blocks greater than 11m in height will be non-combustible as discussed in Section 6.2.

1.4.4 Means of Escape for All Building Users and Evacuation Strategy

The residential accommodations and ancillary accommodations will evacuate independently of one another. The residential apartments will implement a stay-put policy, whilst the ancillary accommodations and commercial unit on site will adopt independent simultaneous evacuation approaches.

To assist with the evacuation of disabled occupants as recommended in the London Plan dated March 2021, a lift designed for evacuation purposes will be provided alongside the firefighting lift in most blocks (except Building F, J2 and Q) to provide a dignified escape for disabled occupants within the building. The same lift designed for evacuation purposes will be provided alongside the passenger lift in Building F, J2 and Q. This is discussed further in Section 3.8.

The residential amenity, commercial and office units, ancillary areas, car park, the supermarket and its associated accommodations will be separated from the residential cores, and these areas will adopt simultaneous evacuation strategy.

1.4.5 Passive and Active Fire Safety Measures

The apartments and duplexes will be provided with an automatic fire alarm and detection system in accordance with BS 5839 Part 6.

The residential common corridors at the upper levels will be provided with a mechanical smoke ventilation system (MSVS) or a natural ventilation means as discussed in detail in Section 3.3.

The ancillary spaces, stores, plant and refuse rooms will be provided with an automatic fire alarm and detection system in accordance with BS 5839 Part 1. This also applies to the commercial units.

Sprinkler coverage is provided to all the residential accommodations and shall be extended to cover the ancillary accommodations. A commercial sprinkler system will be provided to cover the commercial units and covered car park in accordance with BS EN 12845.

The apartments and duplexes shall all be enclosed in fire rated construction with fire doors, as will the staircases, lifts and risers. This is discussed in detail in Section 5.2.1. The ancillary accommodation shall also be enclosed in fire rated construction and when accessed via the residential accommodation, this shall be via a protected ventilated lobby as discussed in Section 3.5.2.

Any penetrations through the compartment walls shall be fire stopped.

1.4.6 Access and Facilities for the Fire and Rescue Service

Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. All other blocks (except Buildings F, J2 and Q) exceed 18m in height but do not have a floor area over 900m², therefore these blocks will be provided with one firefighting shaft.

Block M is over 50m in height, therefore it will be provided with a wet riser in the firefighting shaft. Although Buildings F, J2 and Q are under 18m in height, to satisfy the hose laying distance requirement, dry risers will be provided. Therefore, all residential blocks will be provided with a wet / dry riser. The wet / dry riser inlet will be located on the facade of each block and adjacent to the entrance. It will also be within 18m of the fire appliance parking location.

All parts of the floor plates should be covered within 60m when measured along a route suitable for laying hose from a wet / dry riser outlet provided within the firefighting staircase.

Building D is an office building over 18m in height and hence will be provided with a firefighting shaft that incorporates a dry riser. The supermarket does not exceed 18m in height and does not consist of a basement deeper than 10m, therefore it does not require a firefighting shaft. However, dry risers will be provided within protected staircase to achieve the 45m hose laying distance. Other commercial / community units on the ground and ancillary accommodations accessed from the ground level will be provided with access to at least 15% of the perimeter of the unit, or within 45m of every point on the projected plan.

Existing public hydrants will be provided within 100m of the wet / dry riser inlet. To ensure sufficient coverage, additional hydrants will be provided within 90m of the wet / dry riser inlet in accordance with ADB, as discussed in Section 7.

1.4.7 Site Access for the Fire and Rescue Service

Fire tender access will be provided in accordance with the ADB and LFB guidance as discussed in Section 7.

1.4.8 Future Development of the Asset and the 'Golden Thread' of Information

A Regulation 38 pack shall be submitted to the end users upon handover. This will contain all of the details of the building fire safety / protection measures. Any changes to the buildings following their construction will need to maintain the original design intent of this fire strategy and be assessed by a suitable competent person, so as not to reduce the built-in fire safety measures. Whilst it is not possible at this time to specify exactly what will be in this document, it will contain as a minimum the fire strategy (including the evacuation strategy), fire drawings, information on the systems included including operational manuals and maintenance and testing regimes.

2 Legislation

2.1 Building Regulations 2010

The development will consist of new buildings, hence, will be undergoing building works as defined in Regulation 3 of The Building Regulations 2010. All buildings will therefore have to comply with the requirements of Schedule 1 of the Regulations.

The requirements of the Schedule relating to fire safety are:

- B1 – Means of warning and escape
- B2 – Internal fire spread (linings)
- B3 – Internal fire spread (structure)
- B4 – External fire spread
- B5 – Access and facilities for the fire service

The principle aim of the Building Regulations is to ensure the health and safety of people in and around a building.

The 'requirements' set out broad objectives or functions, which the individual aspects of the building design and construction must set out to achieve. They are therefore often referred to as 'functional requirements' and are expressed in terms of what is 'reasonable', 'adequate' or 'appropriate'.

2.2 Approved Document B (ADB)

The Department for Levelling Up, Housing and Communities (DLUHC) has produced a number of guidance documents to assist designers in meeting the relevant requirements of the Building Regulations. These 'Approved Documents' provide guidance on different aspects of the Regulations. Approved Document B – Fire safety (ADB) provides general design guidance on ways in which the functional fire safety requirements can be satisfied.

The Building Regulations 2010 require reasonable standards of health and safety for persons in or about the building to be provided.

However, as with many "deemed to satisfy" documents, the ADB is general in its approach and cannot contain sufficient detail for the multiplicity of building designs and varieties of building fire loads and occupancies encountered in practice.

The recommendations presented in the ADB provide guidance on how to satisfy the functional requirements of the Building Regulations. However, there is no obligation to adopt any particular solution contained in the document. The document recognises this and accepts that, if the requirement can be demonstrated to have been satisfied by alternative solutions, then this is equally acceptable.

This report considers the amendments to the Approved Documents in May 2020 and June 2022 and considers Regulation 7.

2.3 Regulatory Reform (Fire Safety) Order

Once the buildings are occupied, the Regulatory Reform (Fire Safety) Order 2005 (RRO) becomes the controlling fire safety legislation.

Under this order it will be necessary for the owner / occupier of the building to carry out and maintain a fire safety risk assessment.

The building management team will also be responsible under this order to ensure that the buildings' fire safety provisions are appropriately managed, maintained and tested over the whole life of the building.

2.4 The London Plan 2021

The London Plan 2021 forms the statutory spatial development strategy for London. This report addresses the recommendations in Policy D5 (Inclusive Design) and Policy D12 (Fire Safety).

3 Means of Warning & Escape

Schedule 1 of the Building Regulations requires the following functional requirements to be met in respect of B1, Means of Warning and Escape:

“The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times.”

The general principle to be followed when designing for means of escape is that any person confronted by a fire within a building can turn away from it and make a safe escape and therefore alternative means of escape should be available from most parts of the building.

3.1 Evacuation Strategy

Residential means of escape is somewhat different from many other types of buildings in that only the particular apartment that has a fire in it is immediately evacuated. The reasoning behind this is due to the level of compartmentation between each of the apartments and to reduce false alarms affecting all the people within the building. The Fire Service carries out evacuation of the other apartments if necessary. Additionally, an evacuation alert system will also be provided in the buildings over 18m in height to allow the Fire Service to undertake the evacuation part or the whole building if necessary.

The residential amenity spaces, car park, ancillary accommodations, storage, plant facilities and commercial units on the site will be considered completely independent of the residential elements. It is proposed that these areas adopt independent simultaneous evacuation approaches. This is particularly important for areas that may have members of the public who are unfamiliar with the building and any evacuation procedures. An alarm raised within the commercial areas will not cause the evacuation of the residential areas or other commercial areas.

3.2 Travel Distances

The travel distances for the building should follow the recommendations of ADB, which is detailed in the table below.

Purpose Group	Accommodation	Travel within	Maximum travel distance (m)	
			In one direction	More than one direction
1(a)	Duplex	Duplex with protected stairway	N/A	N/A
	Apartment	Open plan apartment	N/A	N/A
	Common Area	Enclosed common corridor	7.5m	30m
		Open deck	N/A	N/A
4	Commercial	Retail	18m	45m
		Office / Workspace	18m	45m
5	Assembly & Recreation	Residential amenity	18m	45m
7	Storage and Car Park	Stores / Car park	25m	45m
	Plant Room	In the room	9m	35m
		Enclosed escape route	18m	45m
		Escape route in open air	60m	100m

Table 2 – Travel Distance Requirements

3.3 Escape within Residential Accommodations

3.3.1 Escape within Duplexes

Buildings J1, J2 and P are provided with duplexes that have independent final exits at ground level and do not connect to residential common areas. The duplexes will be provided with a protected stairway that achieves 30 minutes fire resistance with FD20 internal doors and directly leads to the final exit at ground level.

Building K is also provided with duplexes at Levels 5-6 and Levels 8-9. These duplexes will be provided with a protected stairway that achieves 30 minutes fire resistance with FD20 internal doors and extends to the final exit at the lower level to exit into either the open deck or the common corridor that ultimately lead to the final exit of the building via protected staircases. Additionally, since these duplexes will not have their own external entrance at ground level, they will also be provided with sprinklers in accordance with BS 9251 and a fire alarm system of an LD2 standard designed in accordance with BS 5839 Part 6.

3.3.2 Escape within Apartments

Approved Document B requires that the travel distance from the flat entrance door to any point in any habitable room shall be limited to 9m, and cooking facilities are remote from the main entrance door and do not impede the escape route from anywhere in the flat.

Where the travel distances are extended in an apartment where the living area containing a kitchen is open and the bedrooms are provided as inner rooms, a fire engineering approach would be adopted to assess the escape route from separate habitable rooms and the proximity to the kitchen. This includes supplementing guidance from BS 9991 on open plan apartments, which states that these apartments are acceptable should they conform to the following:

- The size of the open plan flat should not exceed 16m x 12m.
- Open-plan flats should be situated on a single level only.
- The ceilings within the open plan flat should have a minimum height of 2.25m.
- The dwelling should be provided with a Grade D, Category LD1 fire alarm and detection system in accordance with BS 5839:6:2019+A1.
- All rooms should be provided with a sprinkler system in accordance with BS 9251.
- Open plan kitchens should also meet the following:
 - All cooking apparatus, with a fixed connection to the dwelling's electricity or gas supply, should be located as far away from the escape route as practicable. The edge of the cooking apparatus should not be less than 1.8m away from an escape door, a door to an adjoining habitable room (which includes balconies) or a means of escape route to an escape door.
 - A gap of 0.3m should be provided between the leading edge of the exit door from the space containing the cooking facility and the 1.8m zone from the cooking apparatus, to allow people with mobility impairments to access the door hardware.

3.3.3 Escape within Common Corridors

All blocks contain floors over 11m in height, therefore the common corridor should be provided with automatic smoke venting to assist means of escape.

Where travel distances are within 7.5m, either natural or mechanical smoke ventilation is acceptable. Natural ventilation can be provided via a smoke vent with a free area of 1.5m² located on an external wall.

Where travel distances from the furthest apartment entrance doors to the stair doors exceed 7.5m in a single direction as recommended in ADB, smoke ventilation should be provided via a 0.6m² mechanical smoke shaft within 7.5m of the dead end of the common corridor to mitigate the extended travel distances.

Where the open deck access approach is adopted, generally there is little risk of the deck coming smoke-logged and therefore there is no travel distance requirement as recommended in BS 9991.

All cores will be provided with a fire sterile evacuation lobby highlighted in yellow in the following figures which will provide a waiting area for disabled occupants in the event of a fire. The evacuation lobby door shall be provided to separate the stair / lift lobby from the corridor that serves the apartments to prevent smoke ingress into this lobby to allow disabled occupants to evacuate the building. Additionally, Block M is over 50m in height, therefore it is recommended that a 0.6m² natural air supply shaft shall be provided within the stair / lift lobby as part of the smoke ventilation system to provide additional air supply other than solely from the staircase.

Where a mechanical smoke ventilation system is provided to ventilate the common corridor, the mechanical smoke shaft should achieve a minimum of 0.6m² internal free area with a 0.6m² Automatically Opening Vent (AOV) opening into each smoke shaft from each common corridor.

Each staircase will be provided with a 1.0m² automatically opening vent (AOV) at the head of the stairs. The stair and lift lobby doors shall open into the common corridors that are ventilated by the mechanical smoke ventilation system (MSVS) to provide the replacement air for this ventilation system, which shall also protect the staircase from smoke ingress.

At the later stages of design, a Computational Fluid Dynamics (CFD) assessment will be required to validate the smoke venting strategy for all the blocks.

3.3.3.1 Building ABC

Building ABC is connected at all upper levels so technically they are the same building served by two stairs.

Where external podium decks with alternative exits are provided, they will comply with requirements of Clause 7.3 of BS 9991:2024 as summarised below.

- The deck will have the same fire resistance as the floor and be constructed from materials classified as A2-s1, d0 or better;
- The walking surface should be imperforate.
- Where the deck is more than 2m deep, it will require down-stands at 90 degrees to the face of the building on the line of separation between individual flats.
- From 1.1m above the walking surface up to the soffit of the soffit of the deck, the outside wall of the deck will have a minimum of 50% evenly distributed free vent area.

For open decks providing a single direction of escape, the following additional provisions shall be provided:

- The face of the building (excluding window openings) should provide at least 30min fire resistance.
- Window openings should not extend below a height of 1.1m above the deck level. Alternatively, the glazing will need to be fire rated for 30 minutes fire resistance.
- Surface materials of the facing wall, balcony soffit and balustrade should be of A2-s1, d0 or better.
- Apartment entrance doors opening onto the balcony should be FD30 self-closing doors.
- The external balustrade should be continuous and using imperforate infill materials.

In Building ABC, there are voids with a minimum distance of 1.8m between the face of the building and the deck. In this case, the deck shall only comply with the first requirement discussed above.

Additionally, the length of the deck shall be such that no point in any flat exceeds the hose-laying distance from the rising main landing valve within a firefighting shaft for a sprinklered building. In the case of Aylesham, since all deck approaches are adopted in buildings provided with firefighting shafts and sprinkler protection, the hose laying distance for all decks will be within 60m.

The travel distances and down-stand provisions in Building ABC are as shown in the following figure.



Figure 2 – External open deck of Building ABC at lower floors (Left: L1 and Right: L2)

The building steps back at upper levels with access to two stairs similar to lower floors.

3.3.3.2 Building E

Building E is provided with residential apartments from Level 1 to 10 that are served by two stairs.

The travel distance from the furthest apartment exceeds 7.5m in single direction in one corridor, therefore a mechanical smoke shaft will be provided at the dead-end corridor to mitigate the extended travel distance. The other corridor will also be provided with a 0.6m² mechanical smoke shaft to protect the stair and the lift lobby from smoke ingress.

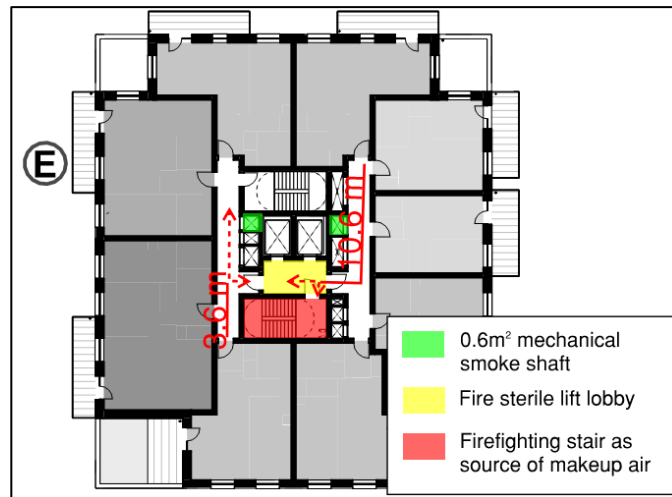


Figure 3 – Travel distances of Building E at typical floor

3.3.3.3 Building F

Building F is below 18m in height and is therefore provided with one protected escape stair.

Since the travel distance from the furthest apartment is over 7.5m, a mechanical smoke shaft will be provided at the dead-end section of the corridor. The other corridor will also be ventilated via a 0.6m² mechanical smoke shaft at the dead-end section to protect the lift lobby from smoke ingress.

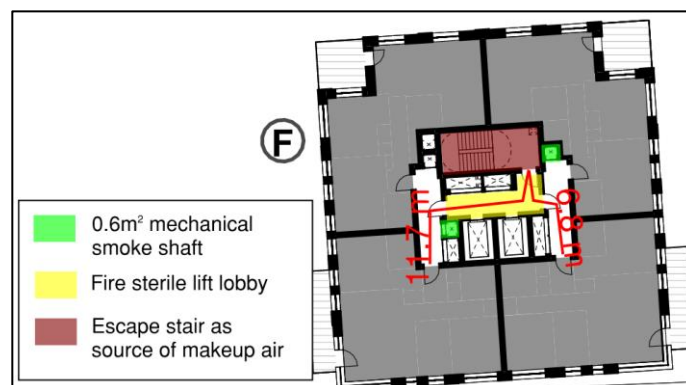


Figure 4 – Travel distances of Building F at typical floor

3.3.3.4 Building G

Building G is provided with residential apartments from Level 1 to 11 that are served by two stairs, with no dead-end travel distances.

To protect the lift lobby and the stair from smoke ingress, the corridor will be provided with mechanical smoke ventilation via two 0.6m² mechanical smoke shafts.

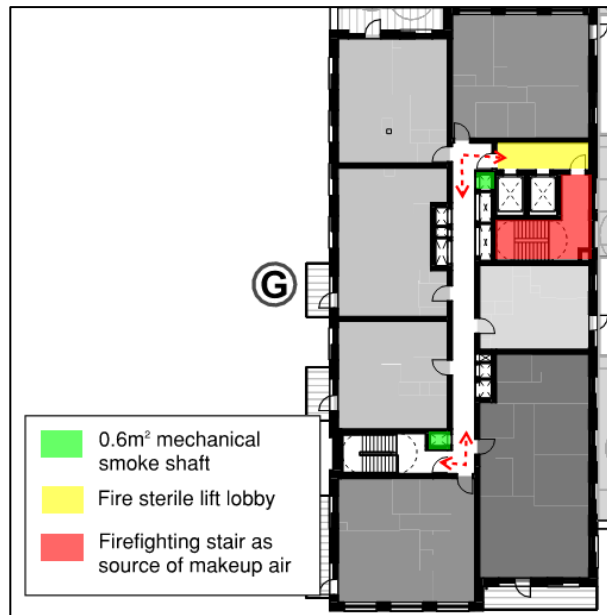


Figure 5 – Travel distances of Building E at typical floor

At Level 9 the building steps back, and the building shall continue to be served by two stairs with a lift lobby accessed from ventilated corridor similar to the levels below.

3.3.3.5 Building H

Building H is provided with residential apartments from Level 1 to 8 that are served by two stairs.

Since the travel distance from the furthest apartment is over 7.5m, a mechanical smoke shaft will be provided at the dead-end section. The other corridor will also be ventilated via a 0.6m² mechanical smoke shaft at the dead-end section to protect the lift lobby and the stair from smoke ingress.

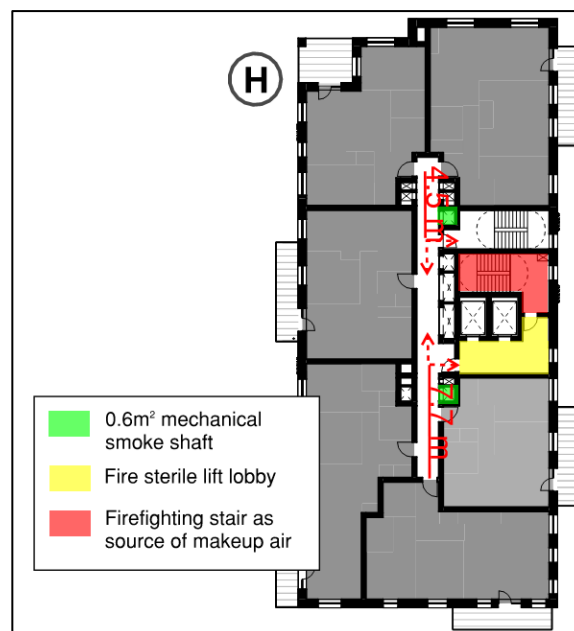


Figure 6 – Travel distances of Building H at typical floor

3.3.3.6 Building J

Building J1 and J2 are independent buildings that do not have internal connections and are separated by a party wall.

Building J1 is provided with residential apartments from Level 1 to 15 that are served by two stairs.

The travel distance from the furthest apartment door to the point where two directions are available exceeds 7.5m. Therefore, the corridor is ventilated via a 0.6m² mechanical smoke shaft at each dead-end of the corridor.

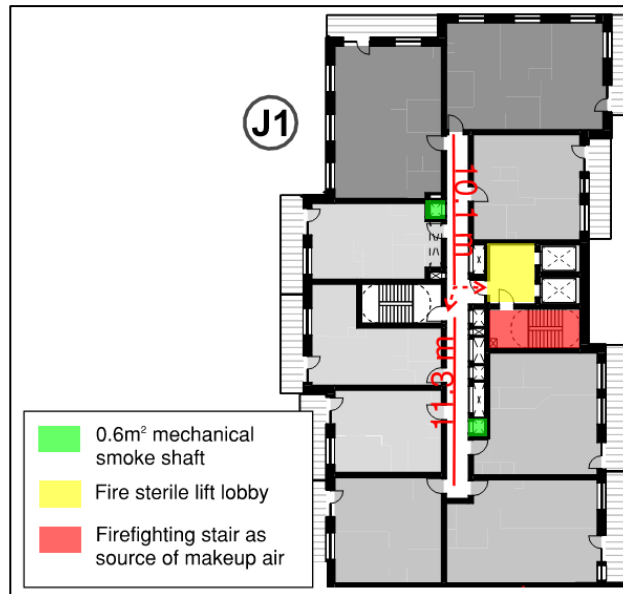


Figure 7 – Travel distances of Building J1 at typical floor

Building J2 does not exceed 18m in height and is therefore provided with one stair that serves all residential apartments from Levels 1 to 5.

Since the travel distance from the furthest apartment is over 7.5m in one corridor, a mechanical smoke shaft will be provided at the dead-end section. The other corridor will also be ventilated via a 0.6m² mechanical smoke shaft at the dead-end section to protect the lift lobby from smoke ingress.

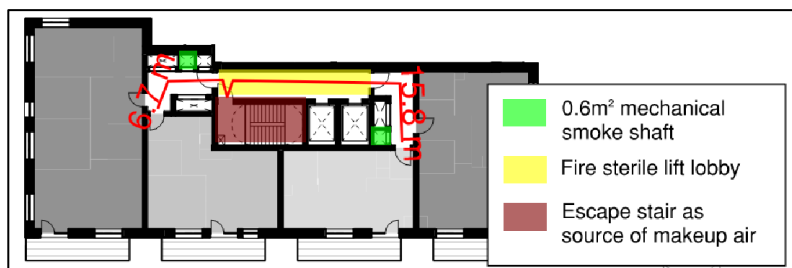


Figure 8 – Travel distances of Building J2 at typical floor

3.3.3.7 Building K

Building K is provided with residential apartments from Level 1 to 8 that are served by two stairs. Level 9 is not accessible for duplexes where the exit is provided at the lower level as discussed in Section 3.3.1.

At Levels 1 to 5, an external podium deck that leads directly to the lift lobby is provided and shall comply with requirements as outlined in Section 3.3.3.1. Additionally, an enclosed common corridor is provided at all levels. To protect the lift lobby from smoke ingress, two 0.6m² mechanical smoke shafts will be provided to ventilate the enclosed corridor. A self-closing cross-corridor FD30S door shall be provided as shown in the following figure.



Figure 9 – Travel distances of Building K at typical floor

The building steps back at Level 6, and the residential apartments shall continue to be served by two stairs with a lift lobby accessed from a ventilated corridor similar to the levels below.

3.3.3.8 Building L

Building L is provided with residential apartments from Level 1 to 9 that are served by two stairs.

At Levels 1 to 8, an external podium deck that leads directly to the lift lobby is provided and shall comply with requirements as outlined in Section 3.3.3.1. Additionally, an enclosed common corridor is provided at all levels, which is provided with a 0.6m² mechanical smoke shaft at the dead-end section to mitigate the extended travel distance.

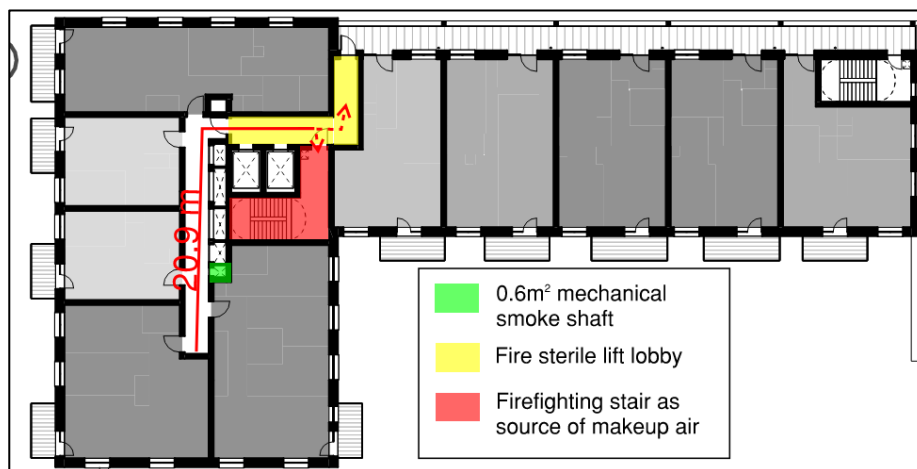


Figure 10 – Travel distances of Building L at typical floor

At Level 9 a roof garden forms part of an alternative escape route. The enclosed corridor will be ventilated via the mechanical smoke shaft extended from lower levels.

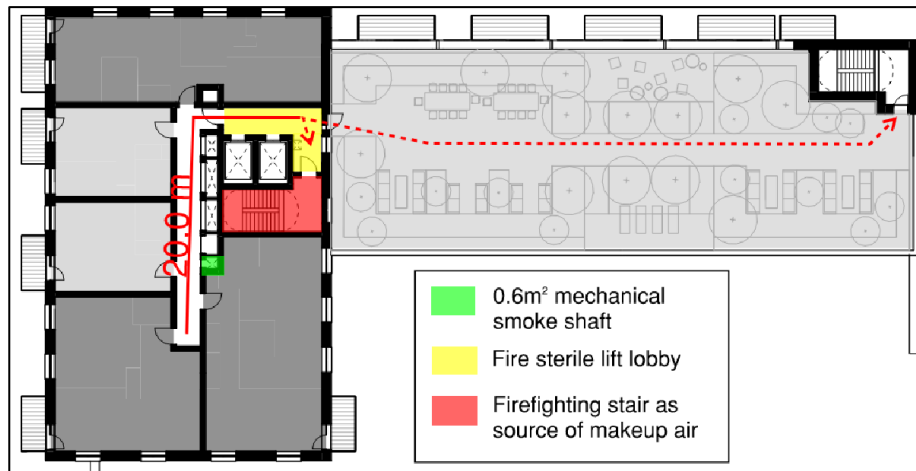


Figure 11 – Travel distances of Building L at L9

3.3.3.9 Building M

Building M is provided with residential apartments from Level 1 to 19 that are served by two stairs.

A mechanical smoke shaft will be provided at each dead-end section of the corridor. Additionally, due to the building over 50m in height, a 0.6m² natural air supply shaft shall be provided adjacent to the stair / lift as part of the smoke ventilation system to provide additional air supply to the stair/lift lobby other than solely from the stair.

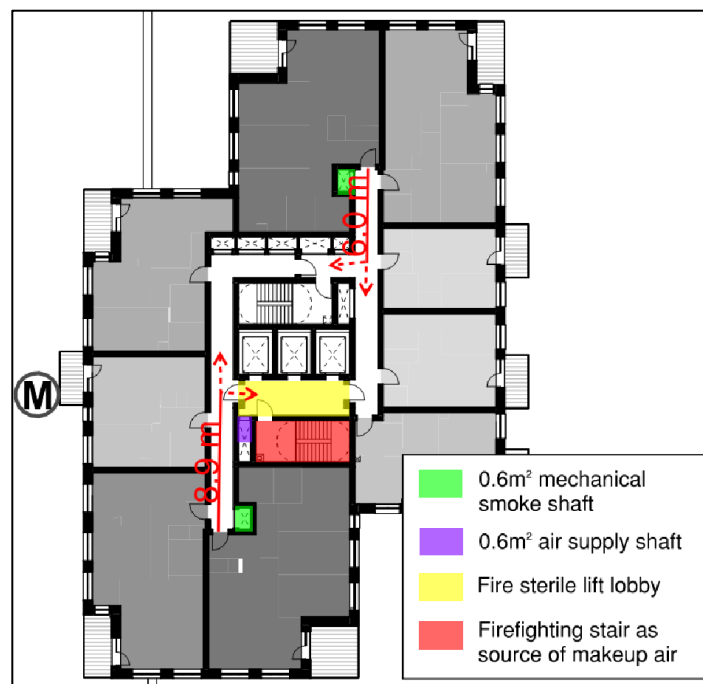


Figure 12 – Travel distances of Building M at typical floor

At Level 18, the building steps back. The corridor will be ventilated via the mechanical smoke shaft extended from lower levels as shown in the figure below.

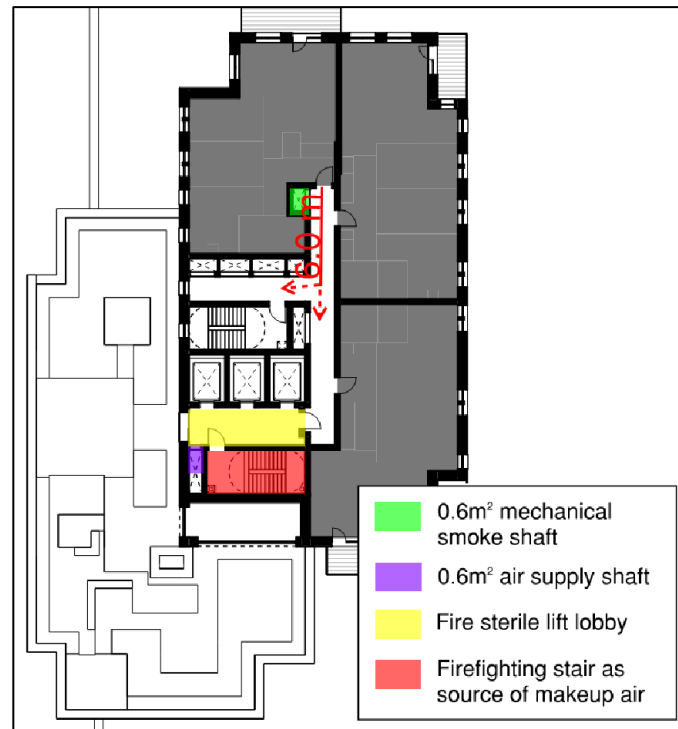


Figure 13 – Travel distances of Building M at L18-19

3.3.3.10 Building N

Building N is provided with residential apartments from Upper Ground Floor and Level 1 to 11 that are served by two stairs.

At Upper Ground Floor, the travel distance from the furthest apartment is within 7.5m in single direction. To protect the lift lobby from smoke ingress, the corridor will be provided with mechanical smoke ventilation via a 0.6m² mechanical smoke shaft in the dead-end section.

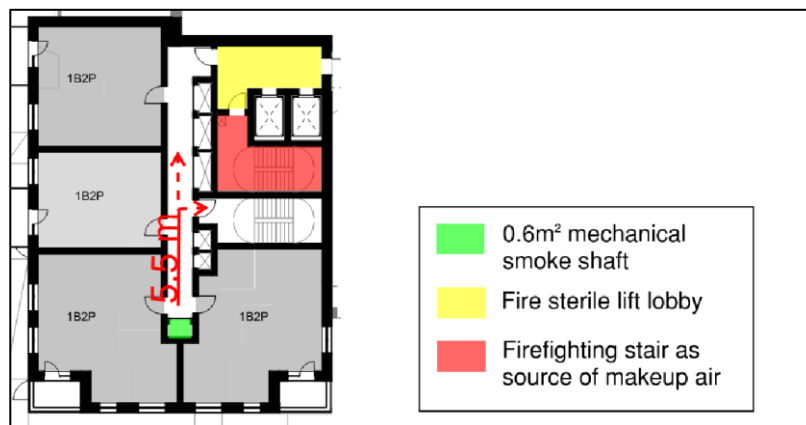


Figure 14 – Travel distances of Building N at UG floor

At Level 1, the building expands and an external podium deck that leads directly to the lift lobby is provided and shall comply with requirements as outlined in Section 3.3.3.1. The enclosed common corridor will be ventilated via the 0.6m² mechanical smoke shafts extended from the floor below.

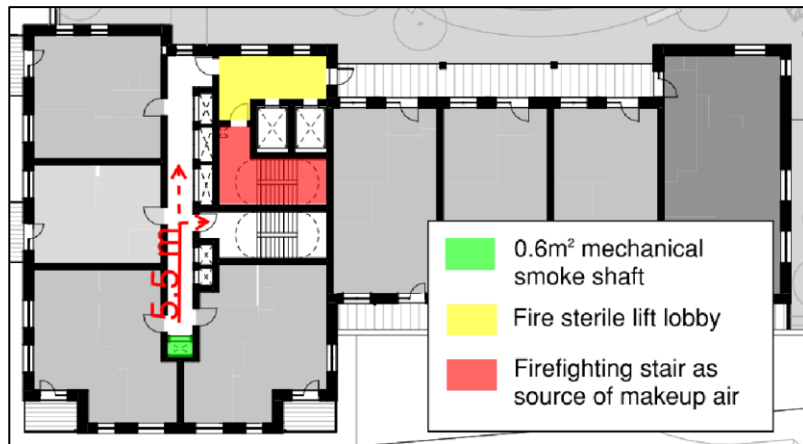


Figure 15 – Travel distances of Building N at typical floor

At Level 5, the building steps back with a similar layout as Level 1, served by two stairs with a lift lobby accessed from a ventilated corridor.

3.3.3.11 Building P

Building P is provided with residential apartments from Upper Ground and Levels 1 to 10 that are served by two stairs.

At Upper Ground Floor, one apartment is provided with alternative escape routes. The corridor will be provided with mechanical smoke ventilation to protect the stair and the lift lobby. Additionally, the mechanically ventilated corridor will separate ancillary accommodation from the residential common areas.

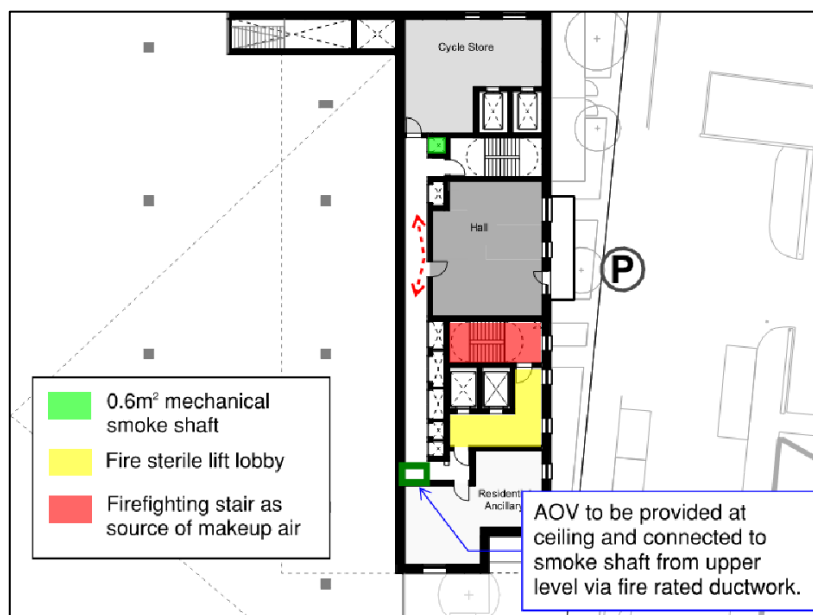


Figure 16 – Escape routes of Building P at UG floor

At Level 1, the building expands with the travel distances from the furthest apartment being within 7.5m in single direction.

To protect the lift lobby and the stair from smoke ingress, the corridor will be provided with mechanical smoke ventilation via two 0.6m² mechanical smoke shafts. The mechanical smoke shaft will require to drop within an apartment at Level 1 and transfer to the smoke shaft that also serves the Upper Ground floor.

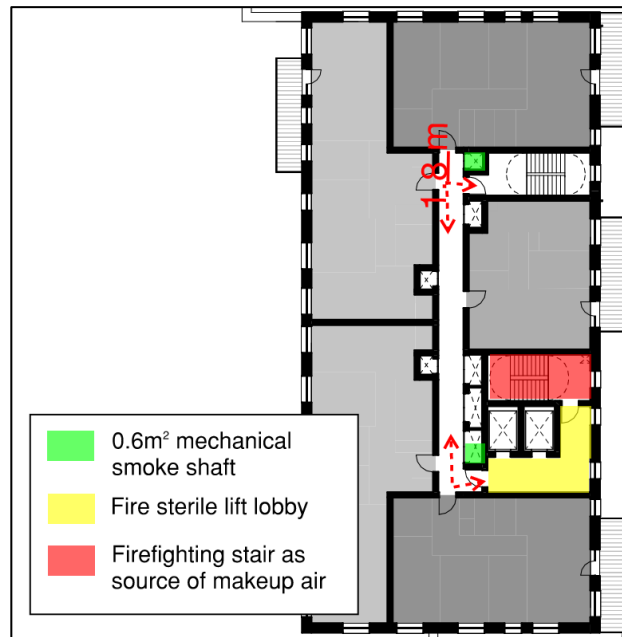


Figure 17 – Travel distances of Building P at typical floor

At Level 10, the building steps back, and the apartments will continue to be served by two stairs with a lift lobby accessed from a ventilated corridor similar to the floor below.

3.3.3.12 Building Q

Building Q is provided with residential apartments from Level 1 to 4. Although Building Q does not exceed 18m in height, it is also provided with two stairs due to the different management for this Market Sale building.

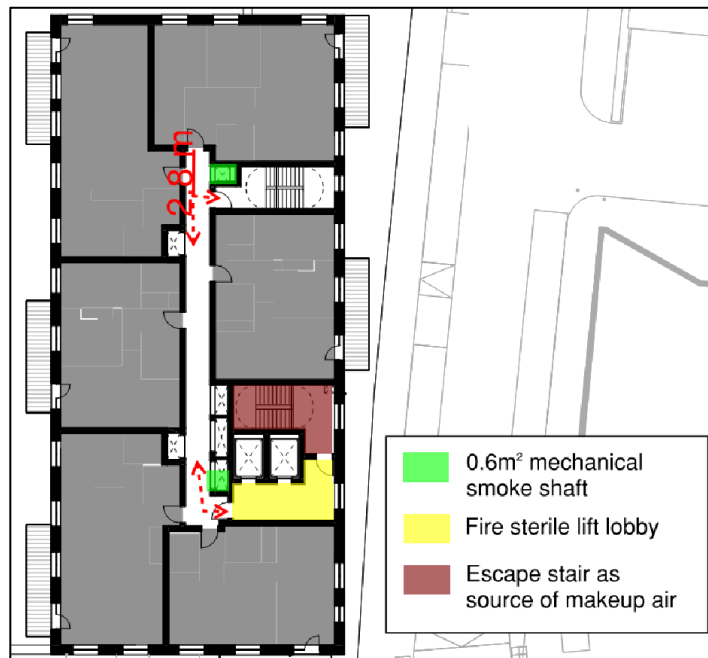


Figure 18 – Travel distances of Building Q at typical floor

3.3.4 Vertical Escape

Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. All other blocks (except Buildings F, J2 and Q) exceed 18m in height but do not have a floor area over 900m², therefore these blocks will be provided with one firefighting shaft.

Each firefighting staircase serving residential accommodations will be at least 1100mm wide, assuming the handrails do not protrude more than 100mm into the stair. However, the firefighting stair widths will be upgraded to be increased to 1200mm to comply with Berkeley Group's Technical Standard TS002. The storey exits leading into the staircase at each level are required to have a minimum clear width of 850mm. The final exit doors at ground level should have a minimum clear width at least as wide as the associated staircase.

Due to the fact that the staircases shall be designed for firefighting, no service risers shall be accessed from or pass through the staircase unless they are for the specific use of equipment within the firefighting shaft, such as emergency lighting or ventilation. Where risers are provided along the protected escape route at ground floor, they will be provided with upgraded fire rated doors with smoke seals to achieve the fire resistance same as element of structure.

Since the firefighting stair of Buildings L and P will be extended to the basement, the stair will be separated from the basement by a vented lobby as shown in the following figures. Additionally, the firefighting stair serving floors both above and below ground level shall be separated at ground floor by a fire door, as indicated in figures shown in Section 3.3.5.

Where the secondary escape stair is not a firefighting stair, the stair should be at least 1000mm wide. The secondary stair shall terminate at ground level.

Buildings F, J2 and Q shall not be designed for firefighting, therefore the minimum width of the storey exits (measured between the walls and / or balustrade) should be not less than 750mm. The minimum width of the staircase in residential buildings should be 1000mm, with the guidance in Approved Document M on minimum widths for areas accessible to disabled people.

3.3.5 Final Exit Routes

Approved Document B requires that any discharge paths from the staircase that are not direct to outside must be along a protected route with any access into adjacent accommodation being by way of a protected lobby.

Most blocks, except Buildings F and J2, are provided with two escape stairs, each via an independent protected escape route to outside. Where ancillary accommodations including plant rooms, stores and the car park are accessed from the residential final exit route in these buildings, a protected lobby vented by 0.4m² permanent ventilation shall be provided.

Additionally, where risers are accessible from the fire service access route in these blocks (except Building Q), the risers should achieve 120 minutes fire resistance with upgraded FD120S doors. Should post boxes be provided in a firefighting entrance lobby, the post boxes should achieve a fire resistance period equal to that of the firefighting shafts, i.e. 120 minutes fire resistance. For Building Q which does not require a firefighting shaft, the risers that are accessible from the final escape route should achieve 60 minutes fire resistance with upgraded FD30S doors.

Where the amenity facilities are accessed from the residential final escape route of these buildings with two stairs, a protected lobby should be provided for the amenity facility. However, should there be any special fire hazards be provided such as cooking facilities, the lobby will be provided with 0.4m² permanent ventilation.

Buildings F and J2 are provided with single escape stair that leads to outside via a protected escape route since the building height not exceeding 18m. No ancillary accommodation shall be internally accessed from these cores. Since these buildings do not require to provide firefighting shaft, the risers that are accessible from the final escape route should achieve 60 minutes fire resistance with upgraded FD30S doors.

The final escape routes and vented lobbies are shown in the following figures.

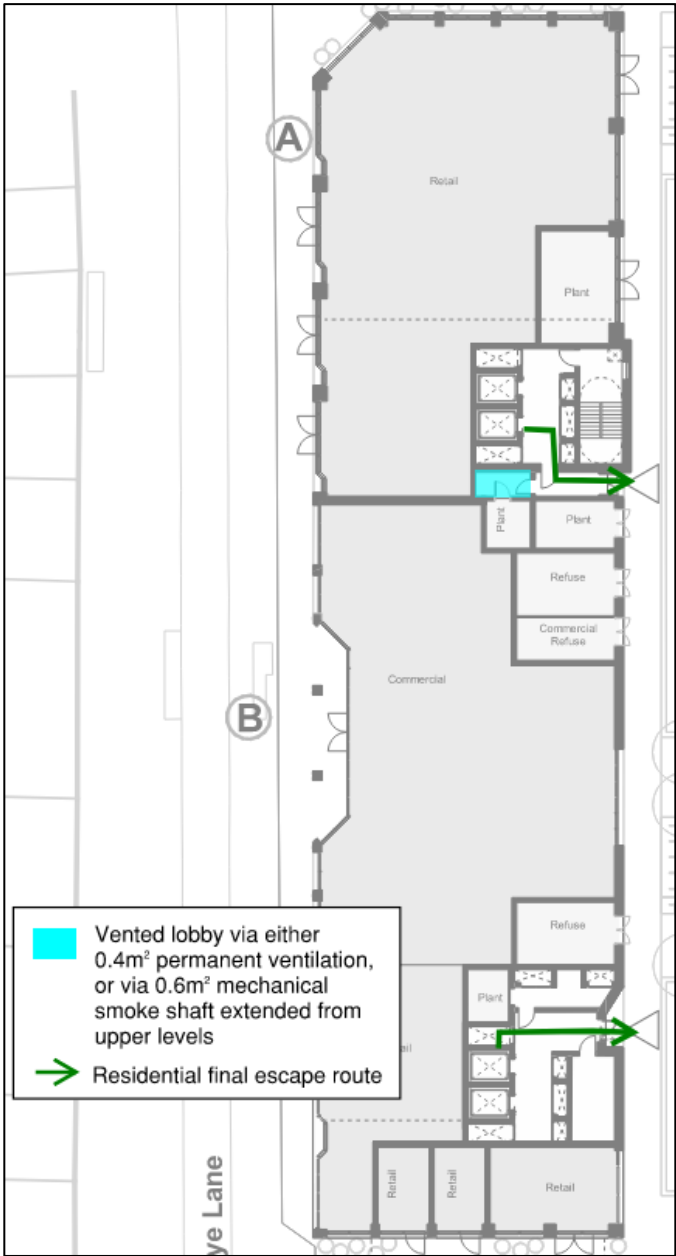


Figure 19 – Final escape routes from Building ABC

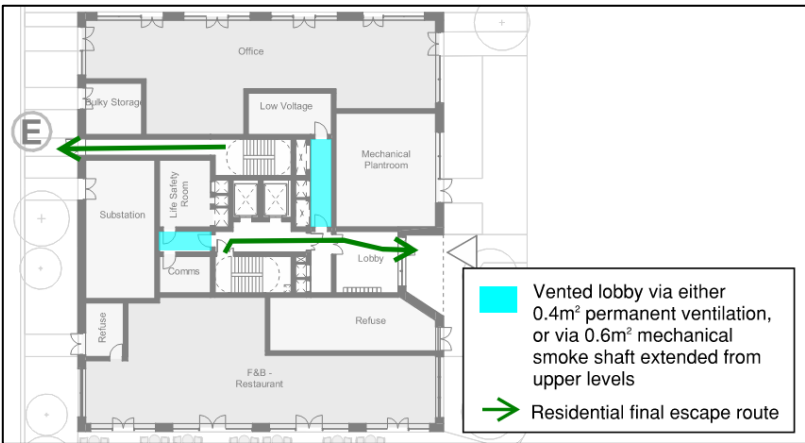


Figure 20 – Final escape routes from Building E

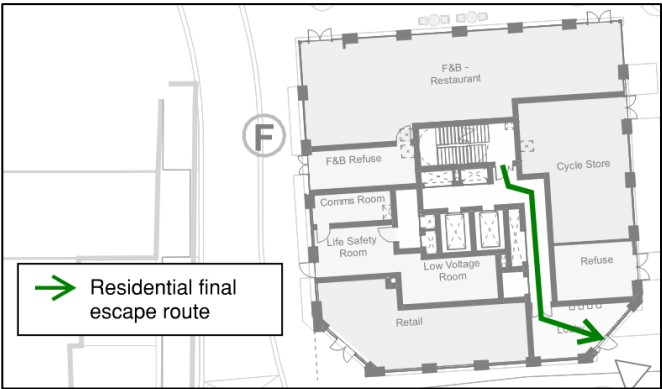


Figure 21 – Final escape route from Building F

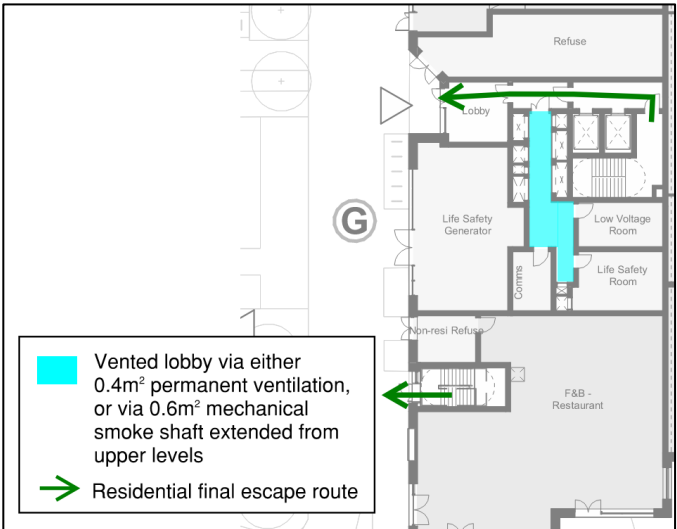


Figure 22 – Final escape routes from Building G

For Building H, the fire access route will be separated from residential entrance lobby via a vented lobby as shown in the following figure.

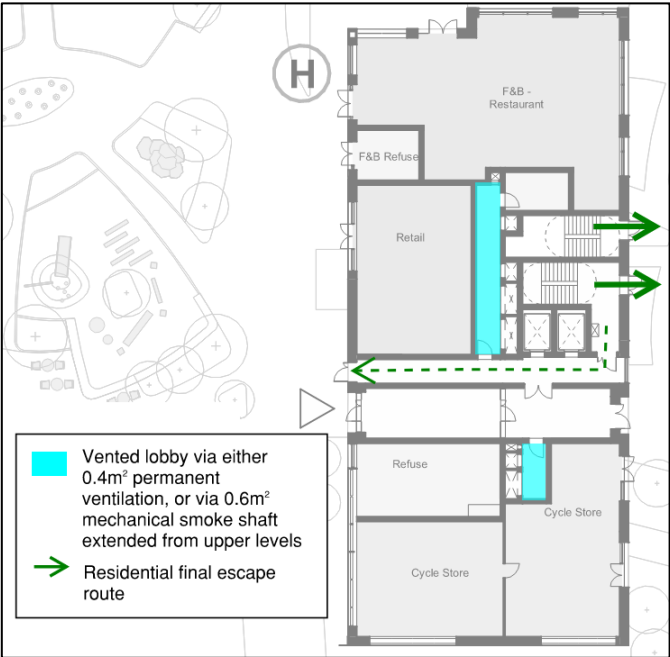


Figure 23 – Final escape routes of Building H



Figure 24 – Final escape routes of Buildings J1 and J2

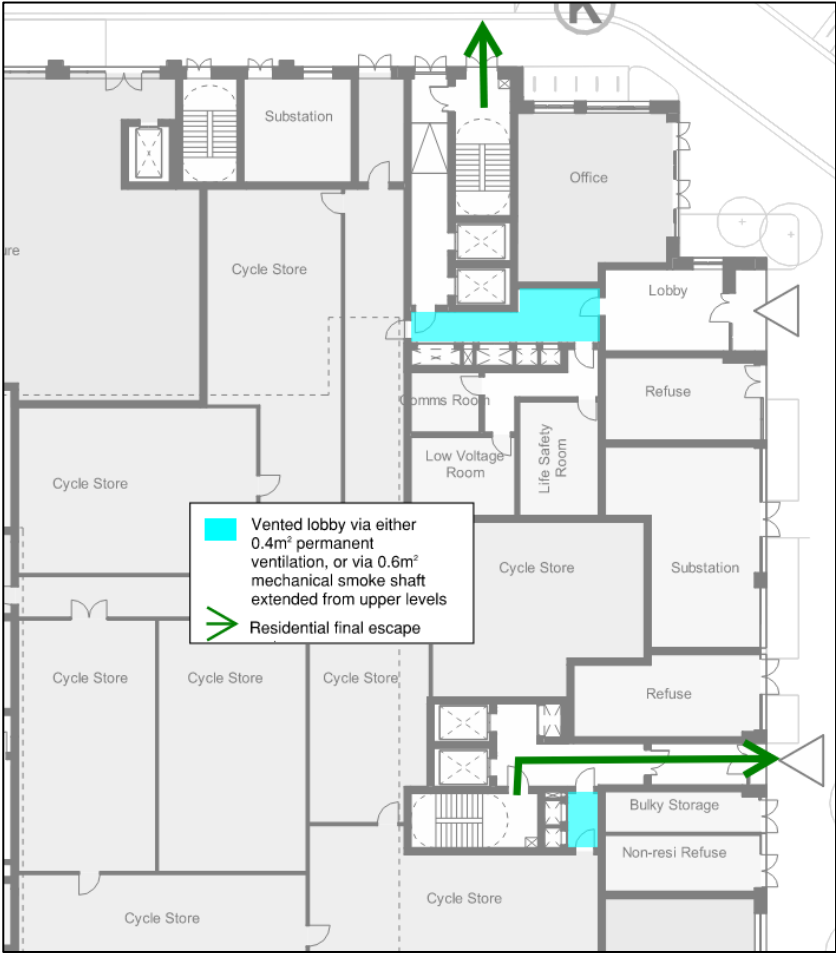


Figure 25 – Final escape routes of Building K

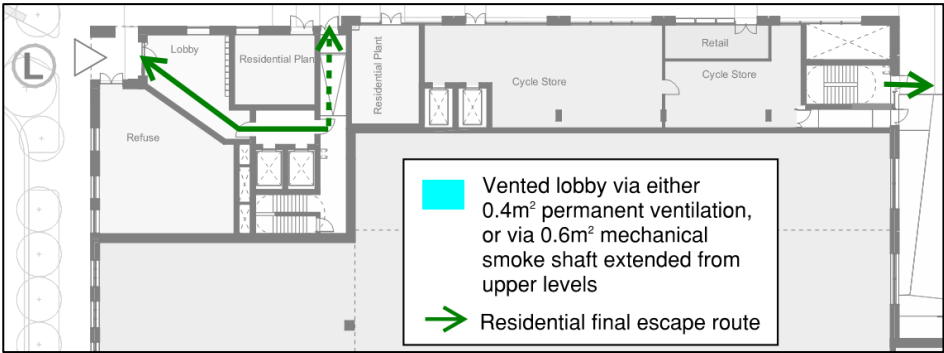


Figure 26 – Final escape routes of Building L



Figure 27 – Final escape routes of Building M

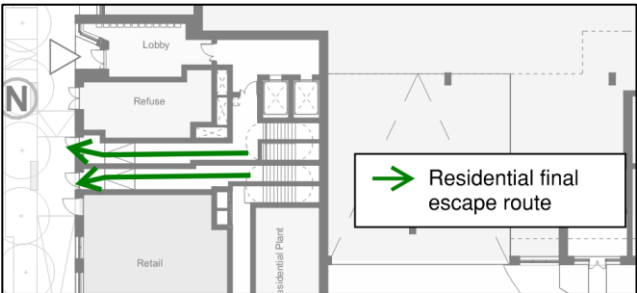


Figure 28 – Final escape routes of Building N

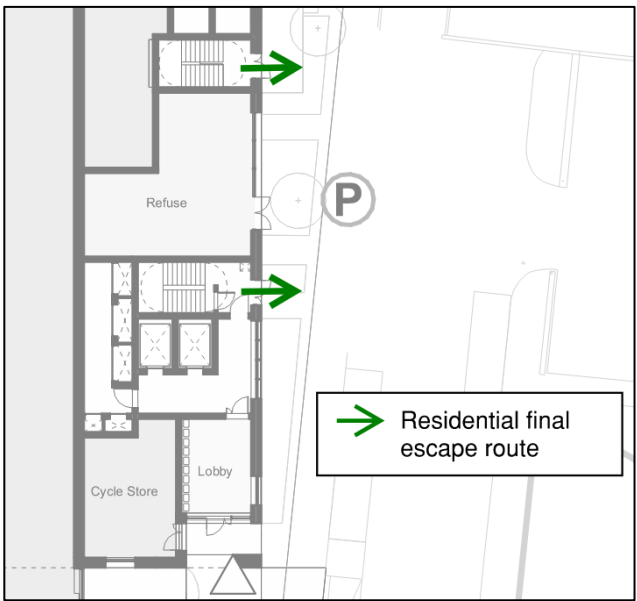


Figure 29 - Final escape routes of Building P

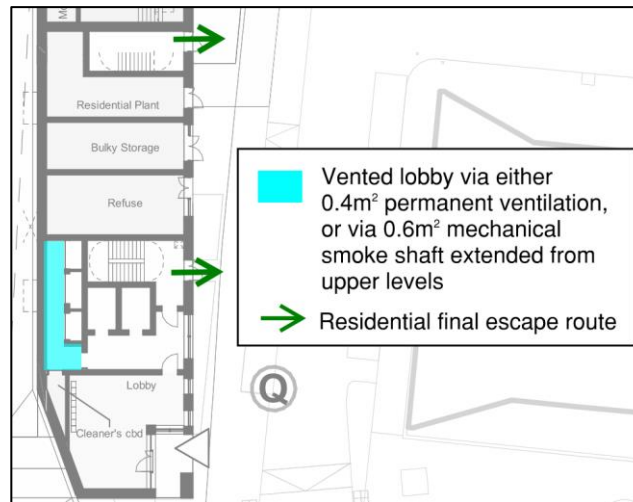


Figure 30 - Final escape routes of Building Q

3.4 Escape within Residential Amenity

3.4.1 Evacuation Strategy

The escape from the amenity facilities will be a simultaneous evacuation as discussed in Section 3.1.

Amenity spaces are provided as shown in the table below.

Level	Building	Amenity
Ground	M	Concierge
Mezzanine	M	Residential amenity space
L1	G/K	Podium garden
	L/M/N/P/Q	Podium garden
L5	A/B/C	Communal roof garden
	N	Communal roof garden
L6	K	Communal roof garden
L9	G	Communal roof garden
	L	Communal roof garden
L18	M	Communal roof garden

Table 3 - Locations of residential amenity

3.4.2 Travel Distances

Travel distances in most residential amenity facilities should be limited to 18m in single direction or 45m in multi-direction escapes. Where fit out has not been confirmed travel distances to be taken as two-thirds of the permitted distance, i.e. 12m and 30m respectively.

For the screening room at Mezzanine floor of Block M, the travel distances should be limited to 15m in single direction escape and 32m for multi-direction escape should fixed seating be utilized. Where fit out has not been confirmed travel distances to be taken as two-thirds of the permitted distance, i.e. 10m and 21.3m respectively.

For open air podiums and roof gardens, there are no travel distance limits for open spaces. However, they should be directly exiting to outside or accessed from a protected corridor.

Where the amenity facilities are accessed from the residential final escape route in a building provided with two stairs, a protected lobby should be provided for the amenity facility. However, should there be any special fire hazards such as cooking facilities be provided, the lobby will be provided with 0.4m² permanent ventilation, as discussed in Section 3.3.5.

As shown in the following figures, the travel distances of most residential amenity are acceptable.

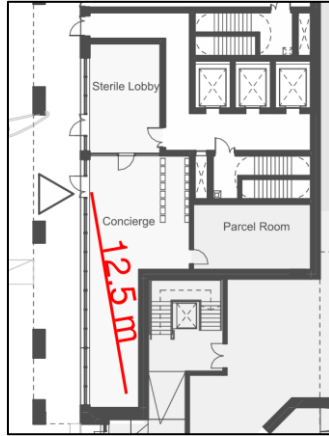


Figure 31 – Travel distances of Building M Concierge

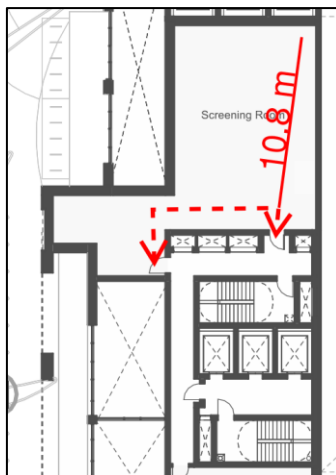


Figure 32 – Travel distances of Screening Room of Building M

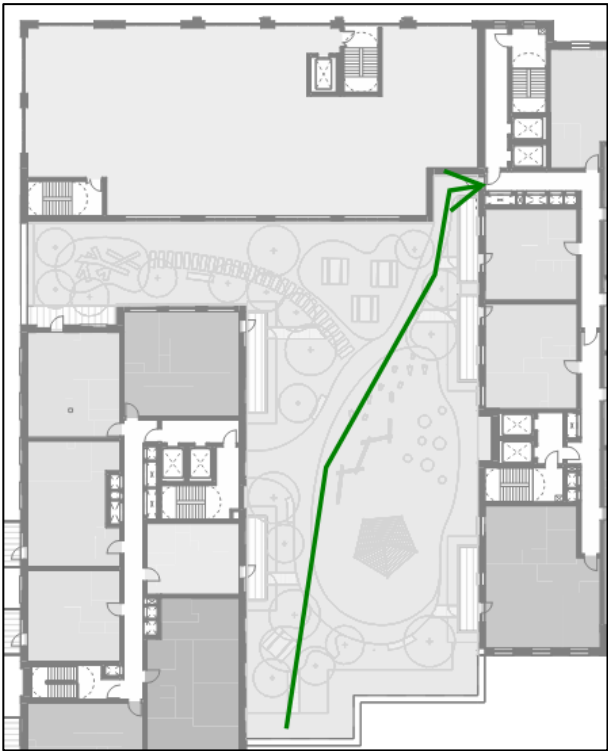


Figure 33 – Escape route of Podium Garden of Buildings G/K

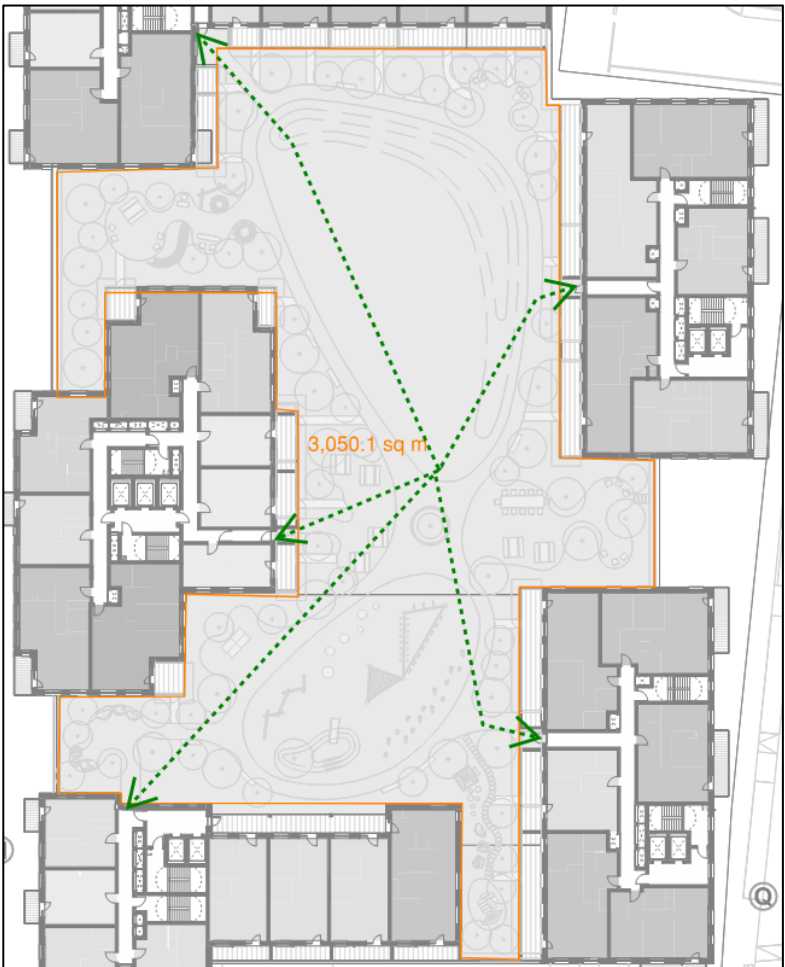


Figure 34 – Escape routes of Podium Garden of Buildings L/M/N/P/Q

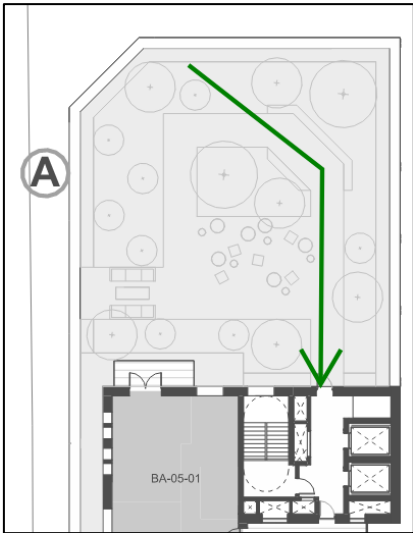


Figure 35 - Escape route of Podium Garden of Building A/B/C

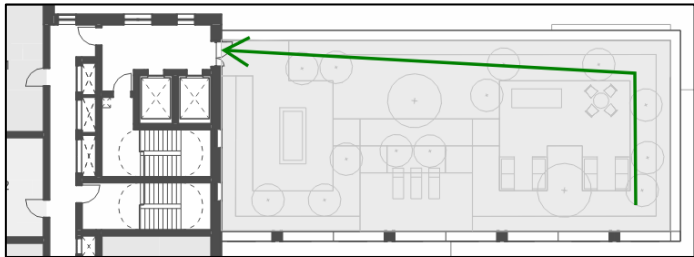


Figure 36 - Escape route of Podium Garden of Building N

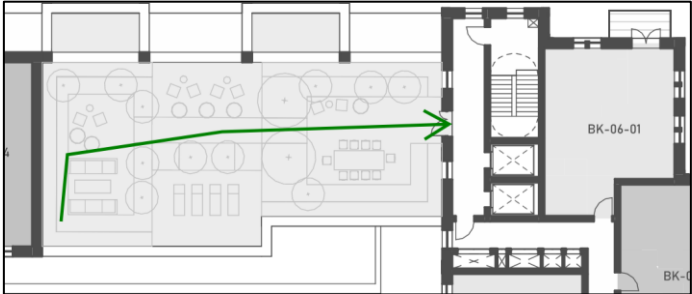


Figure 37 - Escape route of Podium Garden of Building K

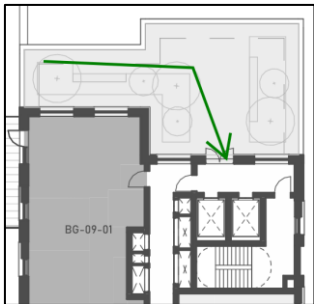


Figure 38 - Escape route of Podium Garden of Building G

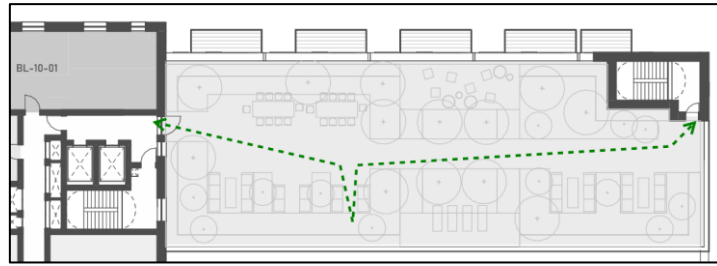


Figure 39 – Escape route of Podium Garden of Building L

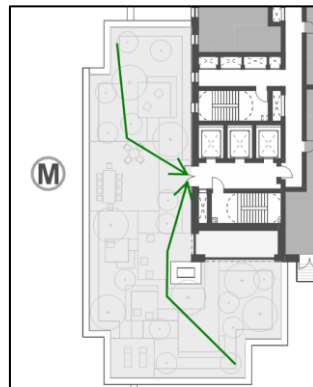


Figure 40 - Escape route of Podium Garden of Building M

3.4.3 Occupancy and Exit Requirements

An adequate number of suitably sized escape routes will be provided from the building to ensure that occupants can escape within an acceptable time. There will be an adequate number of escape routes based on the proposed number of occupants within the building at any one time, whilst making sure travel distances are within those permitted.

To ensure all occupants are able to escape during a fire situation, the largest exit will be discounted. This is to simulate an exit being blocked by fire, the remaining exits will provide sufficient exit capacity for the calculated number of occupants in that space.

In general, the means of escape will comply with the tables below.

Occupancy	Exit Width (mm)
<60	750mm
61-110 people	850mm
111-220 people	1050mm
220+ people	5mm per person (e.g. 300 people = 1500mm)

Table 4 - Minimum Exit widths

Occupancy numbers	Minimum number of exits
60	1
600	2
600+	3

Table 5 - Number of occupants per exit

Based on the above, the residential facilities are expected to have the occupancy loads outlined in the following table.

Block	Accommodation	Area (m ²)	Floor space factor	Occupancy (persons)	Required exit width
M	Concierge	N/A	1.0m ² /person	60 ^{Note 1}	1 x 750mm
G/K	Podium garden	N/A		60 ^{Note 1}	1 x 750mm
L/M/N/P/Q	Podium garden	3050		440 ^{Note 2}	5 x 850mm
A/B/C	Communal roof garden	N/A		60 ^{Note 1}	1 x 750mm
K	Communal roof garden	N/A		60 ^{Note 1}	1 x 750mm
N	Communal roof garden	N/A		60 ^{Note 1}	1 x 750mm
G	Communal roof garden	N/A		60 ^{Note 1}	1 x 750mm
L	Communal roof garden	423		110 ^{Note 3}	2x 850mm
M	Communal roof garden	N/A		60 ^{Note 1}	1 x 750mm

Table 6 – Exit widths of residential facilities

Note 1: Due to the single exit, the maximum occupancy shall be limited to 60 people.

Note 2: Due to the five storey exits with a width of 850mm, the maximum occupancy shall be limited to 440 people.

Note 3: Due to two storey exits with a width of 850mm, the maximum occupancy shall be limited to 110 people.

3.5 Escape within Ancillary Accommodations

Travel distances in plant rooms should be limited to 9m where escape is in a single direction and 35m where escape is possible in more than one direction unless they are places of special fire hazard, in which case the travel distances where there is more than one direction of escape should be limited to 18m.

Travel distances within storage rooms (e.g. cycle stores, refuse stores) should be limited to 25m where escape is in a single direction or 45m where there are two directions of escape.

Where fit out has not been confirmed travel distances to be taken as two-thirds of the permitted distance.

In the cores that are provided with two staircases, should these rooms be accessed from the residential corridor, a 0.4m² ventilated lobby should be provided.

Travel distances of most plant rooms are acceptable, as shown in the following figures. The Low Voltage Room of Building F at Ground level has a travel distance of 11.5m in single direction via an access room and therefore shall be provided with an alternative exit. The Plant Room of Building Q at Ground has a slightly extended travel distance of 10.4m in single direction, which shall also be provided with an alternative exit. At Mezzanine Level of Building M, the ancillary room with a travel distance of 21.5m in single direction would be acceptable on the basis that it is a store and not a plant room.

Since the firefighting stair of Buildings L and P will be extended to the basement, the stair will be separated from the basement by a vented lobby as shown in the following figure. Additionally, the firefighting stair serving floors both above and below ground level shall be separated at ground floor by a fire door as indicated in figures shown in Section 3.3.5.

The residential blue badge car park is provided as part of the supermarket car park at basement level. It will be provided with a dedicated escape route and shown in the following figure. The travel distances of the car park will be discussed in Section 3.6.

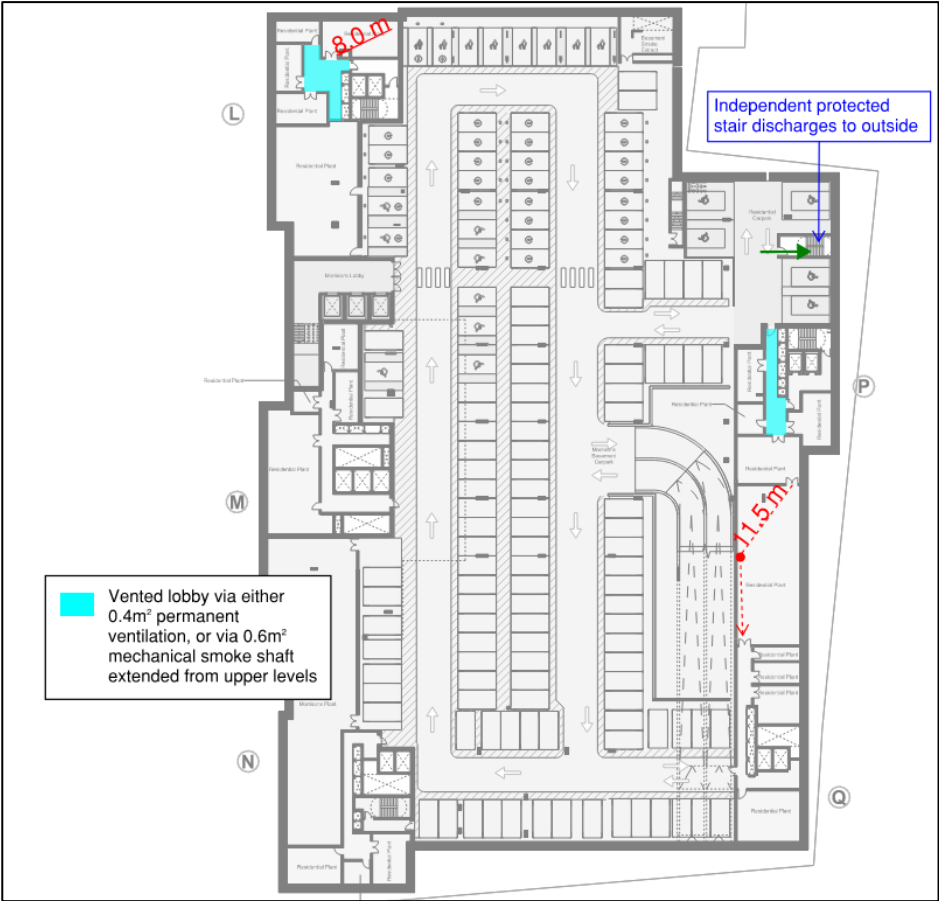


Figure 41 – Travel distances of ancillary accommodations at basement



Figure 42 – Travel distances of ancillary accommodation at ground

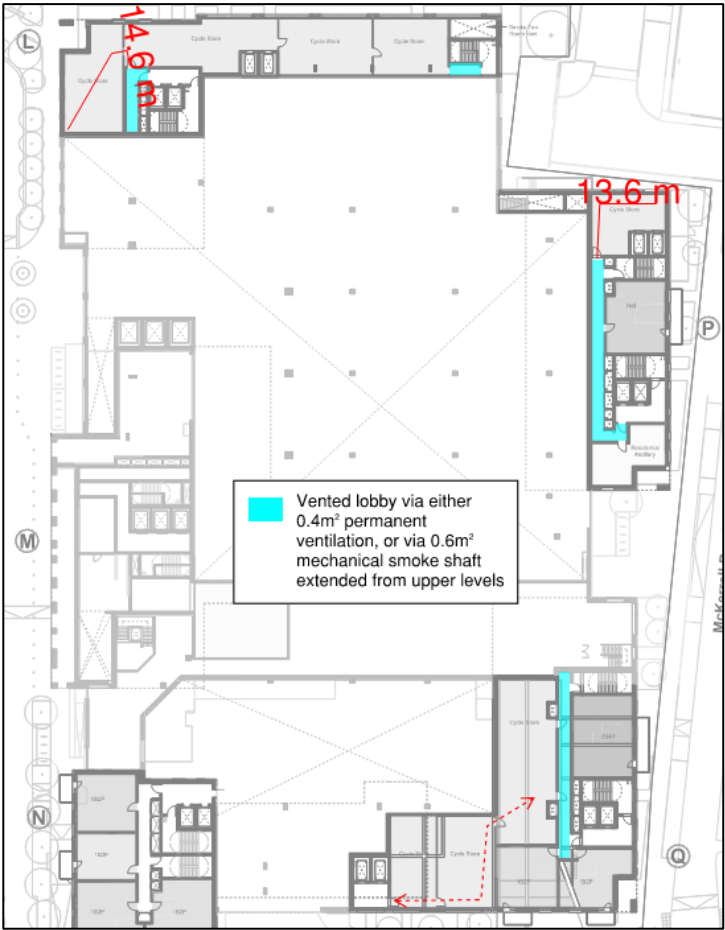


Figure 43 – Travel distances of ancillary accommodations of Buildings L, P and Q at Upper Ground

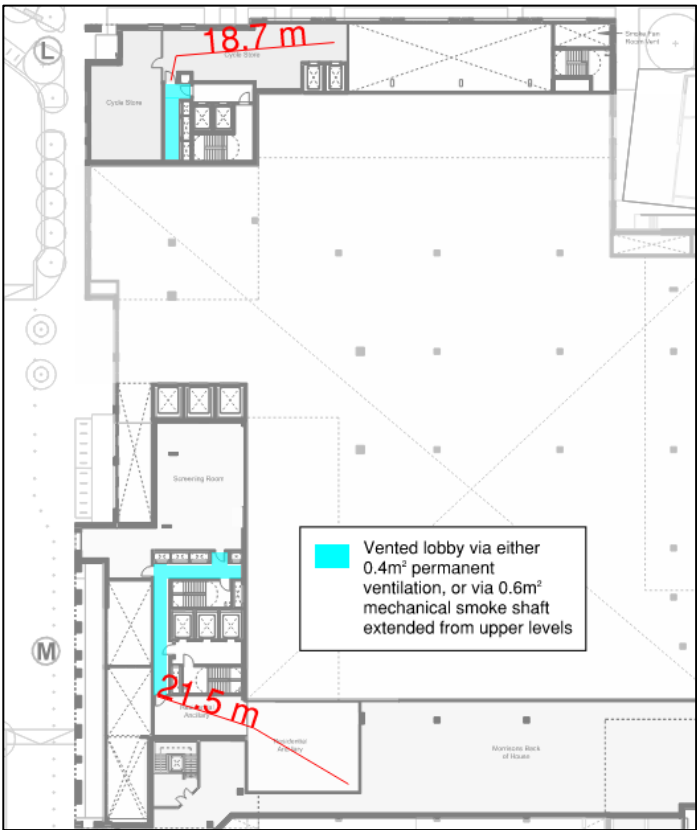


Figure 44 – Travel distances of ancillary accommodations at Mezzanine

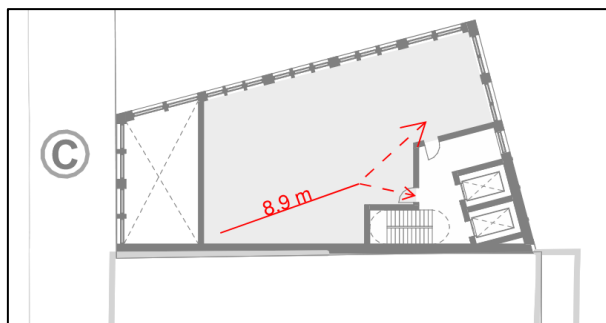


Figure 45 – Travel distances of ancillary accommodation at L1

There are a number of ancillary accommodations are in inner rooms.

Inner rooms can be at risk if a fire starts in the access room. They are acceptable as long as the following is met:

- The occupant capacity of the inner room does not exceed 60.
- The inner room is entered directly from the access room.
- The escape route does not pass through more than one access room.
- The travel distance from any point in the inner room to the exit from the access room does not exceed the allowable one-way travel distance.
- The access room is not a place of special fire hazard and is in the control of the same occupier as the inner room.
- The access room is protected by an automatic smoke detector that either operates an alarm that is immediately audible in the inner room, to a sound pressure level in accordance with the minimum recommended in BS 5839 Part 1 or gives an immediate visual alarm conforming to BS EN 54-23 in the inner room if the ambient noise levels are so great as to make an alarm inaudible.

Ancillary rooms do not tend to have many occupants at any one time due to their use therefore ADB recommends an occupancy load factor of 30m² per person in each room. Therefore, any ancillary room up to 1800m² in area can be served by a single exit door with a clear width of 750mm (subject to acceptable travel distances being achieved). Rooms larger than this require two exits with a clear width of 850mm.

3.6 Escape within Commercial Accommodations

The escape from commercial accommodations will be a simultaneous evacuation as discussed in Section 3.1.

Commercial accommodations are provided as shown in the table below.

Commercial accommodation		Location
Supermarket	car park	Basement
	service yard	Ground
	Sales area & Cafe	Ground
	BOH	Ground, Mezzanine
Building D Office		Ground, Levels 1 to 5 (standalone building)
Commercial gym		Ground of Building K
Various retail units		Ground of Buildings ABC, F, H, J1, K, L and N
Various F&B units		Ground of Buildings E, F, G and H
Various workspace units		Ground of Buildings E, G and K

Table 7 – Locations of commercial accommodations

Travel distances in a commercial unit, including supermarket sales area & cafe, BOH, office and other retails should be limited to 18m where escape is in a single direction and 45m where escape is possible in more than one direction.

Travel distances in a car park or a service yard should be limited to 25m where escape is in a single direction and 45m where escape is possible in more than one direction.

As shown in the following figures, the travel distances of the supermarket car park and service yard are acceptable.



Figure 46 – Travel distances of Supermarket car park

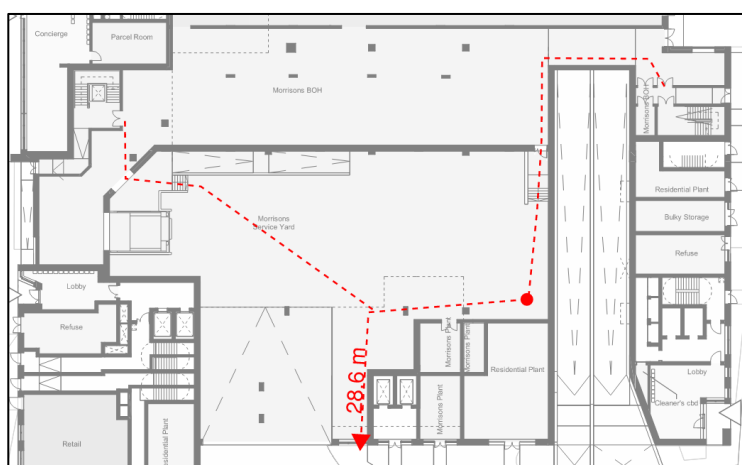


Figure 47 – Travel distances of Supermarket service yard

The travel distances from the supermarket sales area & cafe and BOH will be undertaken as the layouts of these spaces will be developed as the design progresses.

For the office building and other commercial accommodations, most are provided with alternative exits and the travel distances of all the commercial units are acceptable.

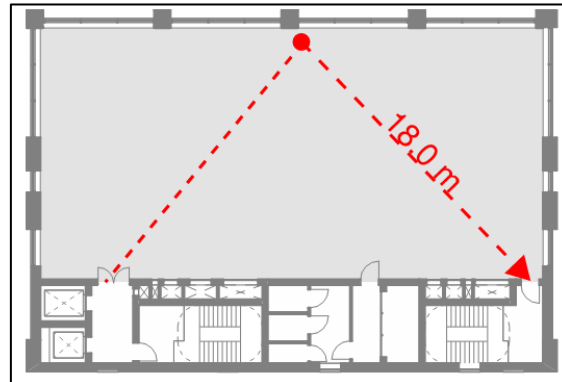


Figure 48 – Travel distances of Building D at typical floor



Figure 49 – Travel distances of various commercial accommodations at Ground

The supermarket car park will require the following exit widths.

Parking Spaces	Occupancy Load Factor	Occupancy (persons)	Minimum Required Exit widths
140	2 people per car	280	4 x 850mm

Table 8 - Car Park Exit Widths

For the office building that is over 18m in height, two stairs are provided for upper levels, with one stair being a firefighting stair. Based on the typical floor area is 399m², with a floor space factor of 6m² per person for an office in accordance with ADB, the maximum calculated occupancy load would be 67 people per floor. Since one firefighting stair and one protected stair will be provided, the calculated

occupancy could be accommodated by two storey exits of 850mm wide each, which will be approached by a protected lobby.

For other commercial units, the exit requirements are outlined in Table 4 and Table 5. Further assessment of the means of escape from these units will be undertaken as the layouts of these spaces will be developed as the design progresses.

For all commercial accommodations, where ancillary accommodations including plant rooms and cycle stores are accessed from an escape stair, a protected lobby vented by 0.4m² permanent ventilation shall be provided. Refuse stores should be approached either directly from open air or via a protected lobby provided with by 0.2m² permanent ventilation.

3.7 Disabled Evacuation

The residential accommodations on the upper levels do not require disabled refuges to be provided.

Policy D5 Inclusive design of the New London Plan outlines that emergency carry down or carry up mechanical devices or similar interventions that rely on manual handling are not considered to be appropriate, for reasons of user dignity and independence. It suggests that the installation of lifts which can be used for evacuation purposes (accompanied by a management plan) provide a dignified and more independent solution.

Furthermore, Policy D12 Fire Safety recommends that in all developments where lifts are installed, Policy D5 Inclusive design requires as a minimum at least one lift per core (or more, subject to capacity assessments) to be a suitably sized lift suitable to be used to evacuate people who require level access from the building.

To facilitate this, a lift for evacuation purposes will be provided within each building. This would allow disabled occupants to descend / ascend to ground floor with level access, and the responsibility for lift control can be confirmed with the management strategy for the building.

In this case, the fire sterile lift lobby will be the place of relative safety for occupants evacuating their apartment and waiting for the lift for evacuation, with the smoke extract system prevent the ingress of smoke into the lift lobby allowing the lift to be utilised. This will also be the case for the communal spaces and roof podiums, with the lift lobby provided within the residential block as the place of relative safety. Evacuation from the podiums and internal amenity space will be assessed as part of the management plan for the building.

One design fire is accounted for, so only the occupants of one apartment will be evacuating at any one time via the lift provided for evacuation purposes.

The commercial units that have single storey located on the ground floor are not required to provide a disabled refuge. However, where the commercial units also operate on Basement or upper levels above ground, a disabled refuge located within a protected corridor / stair and be provided with an Emergency Voice Communication (EVC) panel. The disabled refuge will be 900mm x 1400mm wide and not impede on the escape route from the floor. Where a lift core is provided, a lift for evacuation shall also be provided to comply with the New London Plan, which includes the provision of a protected lobby accessed from the evacuation lift.

The building management forms an integral part of the design and on-going functionality of the building after occupation. The building will have a management team whose responsibilities will include ensuring the fire safety strategy is adopted and enforced. One of the responsibilities of this team will be to develop a management strategy for the building. This strategy will incorporate details of how the building satisfies the requirements of the Equality Act 2010. The management strategy should include information on staff training, how disabled occupants will be evacuated in the event of a fire and identify key roles in ensuring they are assisted in a fire situation.

3.8 Fire Alarm & Detection System

3.8.1 Residential Accommodation

Open plan apartments should be provided with an LD1 automatic fire detection and alarm system with a minimum Grade D power supply, designed, installed and maintained in accordance with BS 5839 Part 6.

Duplexes should be provided with an LD2 automatic fire detection and alarm system with a minimum Grade D power supply, designed, installed and maintained in accordance with BS 5839 Part 6.

The system should be of Grade D1 if the apartments are to be rented accommodation and Grade D2 if they are to be owner occupied.

It is not considered that the private balconies will be required to have an additional sounder as even though they are accessed from one access room the sounder in the apartment will be able to alert the occupants in the balcony to a fire. This is on the basis that anybody in the balcony area will be able to see if a fire occurs in the kitchen / living area. Additionally, it is proposed the sounders in the room that provides access to the balcony should be located such that occupants on the balcony will be able to adequately hear the alarm in the apartment.

An L5 smoke detection system smoke detection system should be provided in the common corridors on each floor. The sole purpose of the detection system is to activate the smoke ventilation system. No sounders or manual call points will be provided in the common areas.

Most residential blocks except Buildings F, J2 and Q are over 18m, therefore they will be provided with an evacuation alert system for use by the fire and rescue service designed in accordance with BS 8629, which will require an alarm sounder in each flat as the control panel shall be capable of triggering evacuation alerts for specific areas within a building.

3.8.2 Residential Amenity Facilities

The fire detection and alarm system should be designed in accordance with BS 5839 Part 1 and be at least of type L3.

3.8.3 Ancillary Accommodation

The fire alarm and smoke detection within the cycle stores, bin stores and plant rooms should be designed in accordance with BS 5839 Part 1 and be of type L3.

3.8.4 Car Park and Service Yard

The car park should be provided with an automatic fire detection and alarm system. This system should be designed and installed in accordance with BS 5839 Part 1 and be a minimum of L5 standard.

Manual call points will be positioned by all exits and escape routes directly to the outside.

Fire alarm sounders and beacons will be provided to ensure an audibility level of 65dBA or 5dBA above background level (whichever is greater) is achieved in these areas. Operation of the fire alarm system will shut down all HVAC systems.

Should the car park or service yard be provided with charging points for electrical vehicles, it is recommended the charging points should be linked to fire alarm system within the car park and the power should be cut to the charging point upon detection within the car park.

3.8.5 Commercial Accommodation

The fire alarm and smoke detection within the commercial units should be designed in accordance with BS 5839 Part 1 and be a minimum of a manual type.

3.8.6 Access Control Measures

Measures to restrict access the buildings should not adversely affect fire safety provisions. Measures should remain for occupants to safely evacuate the building in the event of a fire.

Electrically powered locks should return to the unlocked position in all of the following situations:

- a) if the fire detection and alarm system operates,
- b) if there is loss of power or system error, and
- c) if the security mechanism override is activated.

On activation of the fire alarm and detection system the electromagnetic locks will need release allowing all occupants of the building.

3.9 Emergency lighting

Emergency lighting as backup lighting should meet the recommendations of BS 5266 Parts 1 and 7.

Final locations and routes shall be agreed during the design development.

3.10 Signage

Escape signage should follow the recommendations of BS 5499. Further details will be provided during the design development.

Wayfinding signage will also be required for the fire service and will be detailed as the design develops.

4 Internal Fire Spread (Linings)

Schedule 1 of the Building Regulations requires the following functional requirements to be met in respect of B2, Internal fire spread (linings):

“To inhibit the spread of fire within the building the internal linings shall:

- a) adequately resist the spread of flame over their surfaces; and*
- b) have, if ignited, a rate of heat release which is reasonable in the circumstances.*

In this paragraph “internal linings” mean material lining any partition, wall, ceiling or other internal structure.”

4.1 Surface Linings

The interior wall and ceiling surfaces in buildings can have a significant influence on how fast a fire may develop. It is particularly important that in circulation spaces including staircases, where the rapid spread of fire is most likely to prevent occupants from escaping, surface linings are restricted by making provision for them to have low rates of heat release and surface spread of flame.

The wall and ceilings linings within the building should meet the recommendations outlined in the table below.

Location	Class of Lining
	European Class*
Small Rooms of area less than: • 4m² in residential accommodation • 30m² in non-residential accommodation	D-s3,d2
Other Rooms	C-s3,d2
Circulations spaces within dwellings	C-s3,d2
Other circulation spaces (including the common areas of block of flats, residential amenity facilities, car park & service yard and commercial units)	B-s3,d2
Note: * The European classifications are described in BS EN 13501-1.	

Table 9 – Surface Lining Requirements

For the purpose of these requirements, a wall includes the internal surfaces of internal and external glazing as well as any part of a ceiling which slopes at an angle greater than 70 degrees to the horizontal. Doors, door frames, window frames and frames in which the glazing is fitted, architraves and skirting are also exempt from these limitations.

The class of linings can be downgraded (but not less than Class D-s3,d2) in walls of rooms providing the total area of those parts in any one room does not exceed one half of the floor area of the room and subject to a maximum of 20m² in residential accommodation and 60m² in non-residential accommodation.

5 Internal Fire Spread (Structure)

Schedule 1 of the Building Regulations requires the following functional requirements to be met in respect of B3, Internal fire spread (structure):

1. *The building shall be designed and constructed so that, in event of fire, its stability will be maintained for a reasonable period.*
2. *A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings.*
3. *To inhibit the spread of fire within the building, it shall be sub-divided with fire resisting construction to an extent appropriate to the size and intended use of the building.*
4. *The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.*

The requirements will be met;

- If the loadbearing elements of structure of the building are capable of withstanding the effects of fire for an appropriate period without loss of stability;
- If the building is sub-divided by elements of fire-resisting construction into compartments;
- If any openings in fire-separating elements are suitably protected in order to maintain the integrity of the element; and
- If any hidden voids in the construction are sealed and sub-divided to inhibit the unseen spread of fire and products of combustion, in order to reduce the risk of structural failure and the spread of fire, in so far as they pose a threat to the safety of people in and around the building.

The extent to which these measures are necessary is dependent on the use of the building, its size and on the location of the element of construction.

5.1 Fire Resistance of Elements of Structure

Premature failure of the structure can be prevented by provisions for loadbearing elements of structure to have a minimum standard of fire resistance, in terms of resistance to collapse or failure of load bearing capacity.

The period of fire resistance required in accordance with ADB is linked to the risk profile of the building taking into account the height of the top floor and whether the building is sprinklered or not. Where any element supports another the supporting element should possess at least the resistance of the other. Approved Document B defines an element of structure as:

- a member forming part of the structural frame of a building or any other beam or column;
- a loadbearing wall or loadbearing part of a wall;
- a floor;
- a galley
- an external wall; and
- a compartment wall.

The following are excluded from definition of an element of structure:

- Structure that supports only the roof, unless:
 - the roof performs the function of a floor, such as for parking vehicles, or as a means of escape, or
 - the structure is essential for the stability of an external wall which needs to have fire resistance.

The following table shows the required fire resistance periods for each core.

Building	Top storey height	Fire resistance periods
Building ABC	21.17m	90 minutes
Building D (Office)	21.30m	90 minutes
Building E	33.85m	120 minutes
Building F	17.10m	60 minutes
Building G	37.15m	120 minutes
Building H	26.88m	90 minutes
Building J1	49.43m	120 minutes
Building J2	16.20m	60 minutes
Building K	31.51m	120 minutes
Building L	33.25m	120 minutes
Building M	64.35m	120 minutes
Building N	38.55m	120 minutes
Building P	36.40m	120 minutes
Building Q	16.70m	60 minutes

Table 10 – Fire resistance periods

Where elements of structure support a building above, they should be provided with the structural fire resistance to at least that required for the building they support.

Any elements which only support themselves and or a roof can be non-fire rated.

5.2 Compartmentation

5.2.1 Residential Accommodation

All duplexes and apartments should have 60-minute fire resistant compartment walls with FD30S self-closing front doors.

For all blocks of flats, floors should be compartment floors with a fire resistance equal to the structure.

For all blocks of flats, the fire sterile lift lobby shall be enclosed with 30 minutes fire resistance with FD30S self-closing doors. Where risers are provided in the fire sterile lift lobby at the upper levels, the riser doors shall be provided with smoke seals.

Most blocks except Building F, J2 and Q are over 18m in height, therefore a firefighting shaft will be provided. The firefighting staircases should be enclosed in 120 minutes fire resistance with FD60S self-closing doors. The firefighting lift shafts should have a fire resistance of 120 minutes with FD60 landing doors. In this case, the secondary lift shafts within the cores will be designed for evacuation purposes to provide dignified escape for disabled occupants within the building, hence will also be enclosed in 120 minutes fire resistance with FD60 doors.

The secondary stair will be enclosed in the same fire resistance as the elements of structure with smoke sealed self-closing fire doors achieving at least half of the resistance of the wall.

In these cores, risers should have fire ratings equal to the structure with FD60 doors. On the fire access level, the final exit route from the stairs / lifts to outside should achieve 120 minutes fire resistance. Any risers accessed from this route will need to be provided with the same fire resistance as the stair, with FD120S doors.

Since Building F, J2 and Q are below 18m in height, the buildings do not require to provide a firefighting shaft. All staircases should be enclosed in 60 minutes fire resistance with FD30S self-closing doors, whilst the lift shafts and risers should achieve a minimum period of 60-minute fire resistance with FD30 doors. The lift for evacuation purposes will achieve the same fire resistance as the elements of structure with FD30 landing doors.

It should be noted that ADB requires that any discharge paths from the staircase must be along a protected route with any accommodation being accessed via protected lobby (that will also need to be ventilated for ancillary accommodations). For blocks that are provided with two stairs, the protected lobbies should achieve 120 minutes fire resistance with FD60S doors. The single-stair blocks Building F and J2 do not have connection between the stair and other accommodations.

Openings in compartment walls should be limited to the passage of service ducts and access doors fitted with smoke seals. Where service ducts pass through compartment walls these will be provided with a fire barrier. All openings will be provided with a similar period of fire resistance to the wall they are provided within and the fire doors are to be locked closed.

In order to protect the final exit routes from the building all wall construction within 1.8m of the final exit points will be fire rated to 30 minutes. In general, most final exits are acceptable providing there are two directions of discharge from the exit, however where escape is only possible in a single direction and the exit route in the open air is within 1.8m of the building then any glazing present should be fire rated glazing to 30 minutes (integrity only).

5.2.2 Residential Amenity

Residential amenity facilities on the Ground floor shall be separated from the other residential areas by 60 minutes fire resisting construction with FD30S self-closing doors.

Where the amenity facilities are accessed from the residential final escape route of buildings with two stairs, a protected lobby should be provided for the amenity facility. However, should there be any special fire hazards such as cooking facilities be provided, the lobby will be provided with 0.4m² permanent ventilation.

5.2.3 Ancillary Accommodation

The residential cycle stores and plant rooms should be enclosed in 30 minutes fire resistance with FD30 doors, whilst the bin stores should be enclosed in 60 minutes fire resistance with FD30 doors.

Should the ancillary accommodations be accessed from the final exit route from the stair, this should be via a 0.4m² ventilated lobby. The lobby can alternatively be ventilated by the mechanical smoke shafts from upper levels.

Any electrical sub-stations should be fully separated from the adjacent accommodation spaces by at least 30 minutes fire resisting construction, although these requirements are likely to be superseded by the electricity supplier's requirements, which are typical based on 4 hours fire separation.

Any rooms housing life safety equipment should be enclosed in 120 minutes fire resistance in accordance with BS 8519.

5.2.4 Car Park and Service Yard

The car park and service yard should be separated from the rest of the accommodations the fire resistance similar to the elements of structure (including walls and floors) of the building they are located in.

The car park shall be separated from the residential common area via protected lobbies with 0.4m² permanent vents that lead directly to outside.

5.2.5 Commercial Accommodations

For the commercial units, they should be separated from the rest of the building and achieve the fire resistance similar to the elements of structure (including walls and floors). There should be no connection to the residential areas.

For the commercial Building D, since it is over 18m in height, a firefighting shaft will be provided. The firefighting shaft will be enclosed with a minimum of 120 minutes fire resistance with FD60S doors. The secondary stair will be enclosed in the same fire resistance as the elements of structure with smoke sealed self-closing fire doors achieving at least half of the resistance of the wall.

5.3 Fire Stopping

Fire stopping should be provided as per the guidance in ADB.

5.4 Cavity barriers

Cavity barriers should be provided as per the guidance in ADB.

5.5 Sprinklers

5.5.1 Residential Accommodation

Sprinklers will be provided to all residential accommodation as per the May 2020 amendment to ADB, which requires sprinklers for all residential apartments over 11m in height. Additionally, since the buildings contain a floor over 18m in height, the residential sprinkler system should be designed to a Category 4 in accordance with BS 9251:2021.

5.5.2 Residential Amenity Facilities

The residential amenity facilities that are ancillary to the residential accommodation could be served by the residential sprinkler as long as the rooms are not larger than outlined in Table 4 of BS 9251:2021 as shown below. Rooms larger than this should be served by a commercial sprinkler system in accordance with BS EN 12845.

5.5.3 Ancillary Accommodation

The stores and plant rooms that are ancillary to the residential accommodation could be served by the residential sprinkler as long as the rooms are not larger than outlined in Table 4 of BS 9251:2021 as shown below. Rooms larger than this should be served by a commercial sprinkler system in accordance with BS EN 12845.

Table 4 — Examples of classification of areas and design criteria for areas to be protected with BS EN 12259-1 sprinkler heads

Occupancy	Minimum density mm/min	Area of operation ^{A)}
Car parking ^{B)} within or beneath a block of flats	5.00	100 m ²
Bin store ^{B), C)} within or beneath the flats		72 m ²
Limited office areas (e.g. concierge or site management) ^{D)}		72 m ²
Residents' storage sheds/tenant stores ^{B)}		4 heads
PTSN/CCTV/electrical rooms		72 m ²
Plant rooms		100 m ²
Laundry (with storage and processing of linen, e.g. institutional, care home)		100 m ²
Laundry (communal facility)		72 m ²
Hairdressing room		72 m ²
Retail (e.g. shop)		100 m ²
Bar/restaurant/cafe		72 m ²
Kitchens in student hub accommodation (e.g. self-catering)		72 m ²
Kitchens ^{E)} in residential care or similar premises (e.g. care home) ≤50 m ²		72 m ²
Kitchens ^{E)} in residential care or similar premises (e.g. care home) >50 m ²		72 m ²

^{A)} If the compartment (fire) area is less than 50 m², a maximum of four heads is required as the area of operation. Where greater than 50 m², refer to area of operation or compartment (fire) area, whichever is the lesser.

^{B)} Attention is drawn to the need to consider protection from frost damage.

^{C)} On the basis of the bin store building or compartment (fire) being of at least a minimum of 1 h fire resisting construction from the rest of the buildings.

^{D)} See also [Table 3](#). Conduct a hazard evaluation to determine which option is most appropriate.

^{E)} Kitchens with deep oil cookers should be fitted with an appropriate local application system in addition to the sprinkler protection identified in this table (e.g. LPS1223, see [BS 5306-0](#)).

Figure 50 - Table 4 of BS 9251:2021

5.5.4 Car Park and Service Yard

The car park should be served by a sprinkler system designed in accordance with BS EN 12845.

5.5.5 Commercial Accommodation

All commercial accommodations will be provided with sprinklers in accordance with BS EN 12845.

6 External Fire Spread

Schedule 1 of the Building Regulations requires the following functional requirements to be met in respect of B4, External fire spread:

1. *The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of building.*
2. *The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.*

The objective of this requirement is to ensure that there is sufficient separation between buildings to prevent fire spread and to ensure that fire does not spread up the building façade.

6.1 Unprotected Areas

The unprotected areas are the areas of the façade that are not fire rated (i.e. glazing, etc.), which should be sized so that fire spread is unlikely to occur to buildings on the adjacent site or to separate fire compartments on the same site.

The following calculations have followed the guidance provided in BRE Guide BR187 – ‘External fire spread: building separation and boundary distances’. The following calculations have been carried out for the required boundary distance based on the height of each floor with their biggest elevation available.

One of the worst-case scenarios would be the retail unit in the north façade of Building ABC, with an elevation of 18.3m long x 4m high (as the space height has not been defined, the more onerous figure is used) having the closest distance from the site boundary. Considering that the accommodation shall be provided with an automatic sprinkler system as mentioned in Section 5.5, which allows for the boundary distances to be halved, the required boundary distance is 5.25m. Since the distance from the site boundary is 5.3m, there are no limits to the area of unprotected openings.

Another worst-case scenario would also be retail units that are provided in the west façade of Building ABC, each with an elevation of 29.8m long x 4m high (as the space height has not been defined, the more onerous figure is used) having the closest distance from the notional boundary. Considering that the accommodation shall be provided with an automatic sprinkler system as mentioned in Section 5.5, which allows for the boundary distances to be halved, the required boundary distance is 6.25m. Since the distance from the notional boundary (i.e. the centre line of the public road) is 6.5m, there are no limits to the area of unprotected openings.

More detailed calculations of each elevation will be undertaken at the detailed design stage.

6.2 External Wall Construction

The external envelope of the building should not be a medium for fire spread.

As all residential buildings are over 11m in height and the office building D is over 18m in height, all materials within the external wall should achieve European Classification in A2-s1,d0 or Class A1 classified in accordance with BS EN 13501-1: 2018, in accordance with Regulation 7(2). Although other commercial units are below 11m in height, they are within the apartment buildings and will therefore achieve European Classification in A2-s1,d0 or Class A1.

This does however not apply to the following

- cavity trays when used between two leaves of masonry;
- any part of a roof 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;
- 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; or
- window frames and glass.

Membranes above ground level, although exempt, should achieve a minimum of Class B-s3,d0.

In order to protect the staircases from a fire on the floor plate any wall construction perpendicular to the stair core within 1.8m of the staircase should be fire rated equal to that of the fire protection to the stairs.

6.3 Roofs

Roof coverings for all blocks should be designed in accordance with BS EN 13501-5 as highlighted in Table 12.1 of ADB as shown in the figure below.

Table 12.1 Limitations on roof coverings				
Designation ⁽¹⁾ of covering of roof or part of roof	Distance from any point on relevant boundary			
	Less than 6m	At least 6m	At least 12m	At least 20m
B _{roof} (t4)	●	●	●	●
C _{roof} (t4)	○	●	●	●
D _{roof} (t4)	○	● ⁽²⁾⁽³⁾	● ⁽²⁾	●
E _{roof} (t4)	○	● ⁽²⁾⁽³⁾	● ⁽²⁾	● ⁽²⁾
F _{roof} (t4)	○	○	○	● ⁽²⁾⁽³⁾

● Acceptable.
○ Not acceptable.

NOTES:

Separation distances do not apply to the boundary between roofs of a pair of semi-detached dwellinghouses and to enclosed/covered walkways. However, see Diagram 5.2 if the roof passes over the top of a compartment wall.

Polycarbonate and uPVC rooflights that achieve a class C-s3, d2 rating by test may be regarded as having a B_{roof}(t4) designation.

1. The designation of external roof surfaces is explained in Appendix B.

2. Not acceptable on any of the following buildings.

a. Dwellinghouses in terraces of three or more dwellinghouses.

b. Any other buildings with a cubic capacity of more than 1500m³.

3. Acceptable on buildings not listed in (1) if both of the following apply.

a. Part of the roof has a maximum area of 3m² and is a minimum of 1500mm from any similar part.

b. The roof between the parts is covered with a material rated class A2-s3, d2 or better.

Figure 51 - Limitations on Roof Coverings

6.3.1 Green Roofs

Where green roofs are provided, 500mm wide fire breaks would be required in accordance with GRO Fire Risk Guidance and DCLG Fire Performance of Green Roofs and Walls.

7 Access & Facilities for the Fire Service

Schedule 1 of the Building Regulations requires the following functional requirement to be met in respect of B5, Access and facilities for the fire service:

- 1. *The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life.*
- 2. *Reasonable provisions shall be made within the site of the building to enable fire appliances to gain access to the building.*

The following discusses the implications of these requirements on the proposed design with regard to access and facilities for the Fire Service within and around the building.

7.1 Vehicle Access

Fire Service access is required to provide access for fire personnel and a water supply to within a reasonable distance of the building entrances. Where there are dead end routes within the site, these should either be limited to 20m or a turnaround (turning circle or hammerhead) facility will be provided.

Due care should be given to ensure that the vehicle access route meets the requirements for a pump appliance as shown in the table below (which is taken from London Fire Brigade – Guidance Note 29).

Appliance Type	Minimum width of road between kerBS	Minimum width of gateways	Minimum turning circle between kerBS	Minimum turning circle between walls	Minimum clearance height	Minimum carrying capacity
Pump	3.7m	3.1m	16.8m	19.2m	3.7m	14.0t

Table 11 – Vehicle Access Requirements

The fire service access route throughout the site is shown in the following figure.



Figure 52 - Fire service site plan

Any access / security measures in and around the site (especially any bollards preventing vehicle access) should be bypass-able by the fire service. The details of the bypass arrangements should be developed and agreed with the fire service as applicable.

The supermarket will be provided with dry risers located within a protected stair to achieve the hose laying distance.

The duplexes at ground, other commercial units and ancillary accommodations accessed from the ground level will be provided with access to either at least 15% of the perimeter of the unit, or 45m hose coverage to the furthest point of the floor plate from the parking of the fire tender.

7.2 Internal Fire Service Access

Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. Most other residential buildings (except Buildings F, J2, K and Q) and office Building D exceed 18m in height but do not have a floor area over 900m², therefore these buildings will be provided with one firefighting shaft.

In this case, the firefighting shaft should serve every upper floor level and be designed in accordance with ADB as listed below.

- Be constructed within 120 minutes of fire resisting construction,
- Include firefighting staircase (at least 1100mm wide),
- Include firefighting lift (provided with dual power supply, water protection etc.),
- Ventilated firefighting lobby,
- Outlet from the fire main at each storey that the firefighting shaft serves (within the staircase),
- Protected access (at least 120 minutes) onto firefighting shaft at access level.
- A 1.0m² vent on the top of the staircase.

In the residential accommodation, where the common corridor is to be utilized as the firefighting lobby, the entrance to the stair and lift should not be separated by more than 7.5m. The separation between the common corridor and the apartments must provide a fire resistance of at least 60 minutes as shown in the following figure.

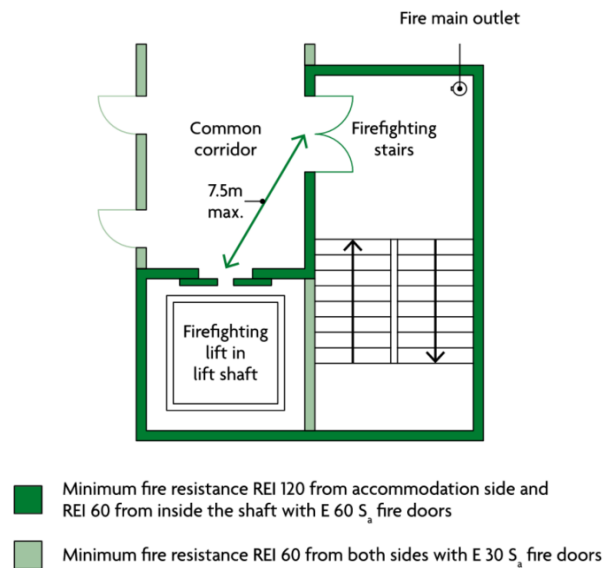


Figure 53 – Internal Firefighting Shaft

The firefighting stair will be provided with a level of lighting recommended in BS 5266 Part 1 and will have a backup power supply capable of maintaining the lighting and other operations in the firefighting shaft for at least 3 hours.

7.3 Wet / Dry Risers

Block M is over 50m in height, therefore it will be provided with a wet riser in the firefighting shaft. Buildings F, J2 and Q do not require a firefighting shaft, however, dry risers will be provided in these buildings to satisfy the hose laying distances. For all other residential blocks, they will also be provided with dry risers in the firefighting shafts.

The office Building D will be provided with a firefighting shaft that incorporates a dry riser due to the building height exceeding 18m but below 50m.

The supermarket does not contain a floor over 18m, and therefore it does not require to be provided with a firefighting shaft. However, dry risers shall be provided to meet the required hose distances.

The wet / dry riser inlet will be located adjacent to the building entrances and be visible from the fire appliance (plus accessible within 18m of the fire appliance parking location).

All parts of the floor plates should be covered within 60m when measured along a route suitable for laying a hose from a wet / dry riser outlet within a firefighting shaft or 45m when measured along a route from a non-firefighting stair. Smoke Venting

7.3.1 Residential Accommodations

The smoke venting requirements for the residential areas and residential amenity are discussed in detail as part of the common areas means of escape section earlier. No further provisions beyond this are needed for firefighting.

At the later stages of design, a CFD study will be undertaken to validate the system.

7.3.2 Ancillary Accommodation

All ancillary accommodation accessed from the stair lobbies in buildings that are provided with two stairs should be accessed via a protected lobby that is ventilated as outlined in Section 3.3.5.

Should the mechanical smoke vent system be extended to the ground floor to vent these lobbies, this is deemed to be acceptable and exceed the lobby venting requirements.

7.3.3 Car Park and Service Yard

The car park and service yard are required to be provided with smoke ventilation.

For the basement car park, a mechanical ventilation system shall be provided to give 6 air changes per hour under normal operation. Under fire conditions the system will be ramped up to provide a minimum of 10 air changes per hour.

For the service yard at ground level, either natural or mechanical ventilation shall be provided. Natural ventilation for smoke venting purposes only shall require openings equating to 2.5% of the service yard area, with at least half of them located on opposing walls. The openings can be at ceiling level. Then for environmental ventilation, impulse/induction fans would be provided, which could switch off in the case of fire.

Alternatively, a mechanical ventilation system could be provided similar to the car park.

7.3.4 Commercial Accommodation

For the office building which is provided with a firefighting shaft due to building height over 18m, ventilation for the firefighting lobby can be via natural ventilation via a 3.0m² smoke shaft or via a 0.6m² mechanical smoke shaft. A 1.0m² AOV shall be provided head of each firefighting stair and protected stair.

For the supermarket and other commercial units, due to the fact that the simultaneous evacuation strategy shall be adopted for these units and they do not require to be provided with firefighting shafts, it is not deemed necessary to provide any smoke venting.

7.4 Hydrants

ADB requires that buildings with wet / dry fire mains should be within 100m from an existing fire hydrant. Where the existing hydrants cannot achieve this, then a private hydrant should be provided within 90m to the wet / dry riser inlet.

The coverage of the existing hydrants is shown in Figure 52. To ensure sufficient coverage, additional hydrants will be provided within 90m of the wet / dry riser inlet in accordance with ADB.

7.5 Emergency Power Supplies

Each life safety system provided within the building will have an independent power supply which would operate in the event of a failure of the main supply.

Secondary power supply should be provided to the following life safety systems:

- Automatic opening vents,
- Mechanical Smoke Venting system,
- Fire Alarm System,
- Emergency lights and signs,
- Residential sprinkler system,
- Commercial sprinkler system,
- Firefighting lifts,
- Lifts for evacuation.

7.6 Firefighting Lifts

Each firefighting lift within the firefighting shaft will be designed and installed in accordance with BS 9999 and BS EN 81-72. The summary of the some of these measures are listed below.

- Dual Power Supply (i.e. emergency, stand-by or alternative power supply),
- Size of the lift should be at least 1100mm wide x 1400mm deep with a rated load of 630kg as described in ISO 4190-1.
- Fire lift switch at access level,
- Fire Service Communication System,
 - Built-in microphone and speaker
- Provision to prevent water penetration into the firefighting lift via,
 - Drainage grid to the lift entrance, or
 - A floor sloped away from the lift entrance, or
 - A raised threshold to the lift entrance (at least 25mm high)
- Water protection to the electronic equipment / control within the firefighting lift well / car,
- Means to prevent water level in a lift pit from reaching equipment.
- Suitable means to prevent water rise above the level of fully compressed car buffer.

7.7 Evacuation Alert System

Most residential blocks (except Buildings F, J2 and Q) exceed 18m in height, therefore they will be provided with an evacuation alert system to allow the fire service to undertake the evacuation of part or the whole building if necessary.

It is recommended that the evacuation alert control and indicating equipment (EACIE) should be designed and installed in accordance with BS 8629.

7.8 Secure Information Boxes

Since all residential blocks are over 11m in height, they are required to be provided with a secure facility to store information about the building for use by the fire service during an incident.

The box should meet all the conditions listed below.

- Sized to accommodate all necessary information
- Easily located and identified by firefighters
- Secured to resist unauthorised access but readily accessible by firefighters,
- Protected from the weather.

Best practice guidance can be found in Sections 2 to 4 of the *Code of Practice for the Provision of Premises Information Boxes in Residential Buildings* published by the Fire Industry Association (FIA).

8 Fire Safety Management

8.1 General

Given the use and likely occupancy of the building, management procedures will assist in the prevention and control of fires and the evacuation of occupants.

Good housekeeping standards will be enforced to ensure that the effectiveness of the fire safety provisions is not affected.

Maintenance procedures will be developed to ensure that all equipment and services within the building are able to operate effectively.

A full Fire Risk Assessment should be carried out by the occupier of the building nearer to the development completion and be in place on occupation to meet the Regulatory Reform Order (RRO). The assessment should be maintained and act as a record of the provision and measures, passive and active, used to minimize fire risk within and around the building.

8.2 Key Management Issues

This section describes each of the key management areas that will need to be implemented and maintained during the lifetime of the building:

- All necessary fire safety systems must be regularly maintained and tested.
- The building management will regularly monitor and control the specification and use of combustibles within the escape routes and circulation areas. These areas will generally be maintained free of all combustibles and the escape routes will be unobstructed at all times.
- A full Fire Risk Assessment will be developed for the building.
- All building staff will receive regular training including roles and responsibilities for key members of staff.

8.2.1 Control of Evacuation and Fire Safety Planning / Implementation

A detailed fire safety plan will be drawn up by the building management, which will provide clear simple advice for the occupants in the event of an emergency.

The fire safety plan will be prepared, maintained and implemented by the fire personnel responsible for the building in question and will include:

- The procedures to be adopted in the event of a fire signal being given
- Procedures for evacuation of occupants (including disabled occupants)
- Procedures for equipment maintenance
- Frequency and nature of fire drills
- Staff training
- Procedures for recording and monitoring equipment maintenance and any fire incidents

Expanding on the information given above the fire strategy includes a number of risk critical areas resulting in the need to formalize the fire safety management in the building. In order to develop and maintain the safety of the building, the building management should formulate a policy statement appropriate to the building configuration, location, occupation, and if relevant, to the building users. The policy statement should include:

- General safety issues related to the use of the building
- Possible fire scenarios
- Aims and objectives of the proposed management system and its methodology

This policy should be endorsed by the highest level of management.

8.3 Regulation 38

To satisfy Regulation 38 to the Building Regulations it is proposed that a full package of building design information is passed to the end users. It is therefore proposed that the following information is provided to the end users:

- The fire strategy report
- Any management information proposed in addition to that contained in this strategy
- Details of all passive fire safety measures (including compartmentation, cavity barriers, fire doors, self-closers and duct dampers)
- Details of the fire alarm and detection systems, emergency lighting, emergency signage, access controls, door hold open devices
- Details of all active fire safety measures
- Details of the wet / dry risers, fire hydrants
- Any high risk rooms and equipment present
- As built plans for the building
- O&M Manuals for the building systems, including commissioning information and certification
- Any provision incorporated into the building to facilitate the evacuation of disabled people

This information will be transferred as a package of information by the main contractor at handover of the building.

9 Conclusions and Recommendations

This report outlines the fire safety strategy proposals for Aylesham Centre and seeks to demonstrate compliance with the Building Regulations (generally in the form of the recommendations of Approved Document B) and all the relevant legislation and requirements of London Plan Policy D12 and D5(B5).

For means of escape, blocks over 18m in height are provided with two escape stairs. Although Building Q does not exceed 18m in height, it will be provided with two stairs for management reasons. The design of the residential blocks, such as travel distances etc., are extended beyond the recommendations of ADB and fire engineered solutions are required as part of the justification. The enclosed corridors to either side of the staircase shall be vented via a 0.6m² mechanical smoke shaft as part of the justification, validated using CFD at a later design stage. An automatic opening vent will be provided at the head of each staircase to provide make-up air to the system.

Buildings F, J2 and Q are over 11m in height and not exceeding 18m, therefore the elements of structure will achieve 60 minutes fire resistance. Buildings A, B, C, D and H are over 18m in height and not exceeding 30m, therefore the elements of structure will achieve 90 minutes fire resistance. All other buildings are over 30m in height and will achieve 120 minutes structural fire resistance in accordance with ADB.

All the residential blocks are over 11m in height and therefore all apartments and duplexes will be sprinklered in accordance with BS 9251. The ancillary accommodation shall either be sprinklered with the residential or commercial sprinkler system depending on the size of the rooms.

Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. Most other residential buildings (except Buildings F, J2, K and Q) and office Building D exceed 18m in height but do not have a floor area over 900m², therefore these buildings will be provided with one firefighting shaft in accordance with Approved Document B. Each shaft will incorporate a firefighting stair, smoke clearance and a wet / dry main.

Block M is over 50m in height, therefore it will be provided with a wet riser in the firefighting shaft. Buildings F, J2 and Q do not require a firefighting shaft, however, dry risers will be provided in these buildings to satisfy the hose laying distances. For all other blocks, they will also be provided with dry risers in the firefighting shafts.

Based upon the above proposals it is considered that adequate measures are provided to meet the functional requirements of the Building Regulations and all the relevant legislation and requirements of London Plan Policy D12 and D5(B5).

10 Appendix A – Qualitative Design Review

10.1 Introduction

10.1.1 Scope

As stated within BS9991 it is recommended that for tall and very tall buildings in excess of 50m in height, a qualitative design review (QDR) is carried out. The QDR process is detailed within BS7974:0 – Application of fire safety engineering principles to the design of buildings – Code of practice.

This is to determine whether any additional measures are required to the design of the building.

This applies to Block M at the Aylesham Centre development.

10.1.2 QDR Team

In line with the recommendations in BS7974, the following members will form part of the QDR team:

- Michel Wizenberg, Principal Fire Engineer (Introba);
- Andy Baker, Associate Fire Engineer (Introba);
- Cheri Ho, Fire Engineer (Introba);
- Romain Muller, Project Architect (dRMM);
- Mark Bacon, Project Technical Director (Berkeley)

This QDR document should be reviewed and agreed upon by all members of the team.

10.2 Legislation

10.2.1 Building Regulations 2010

The development will consist of new buildings, hence, will be undergoing building works as defined in Regulation 3 of The Building Regulations 2010. All buildings will therefore have to comply with the requirements of Schedule 1 of the Regulations.

The requirements of the Schedule relating to fire safety are:

- B1 – Means of warning and escape
- B2 – Internal fire spread (linings)
- B3 – Internal fire spread (structure)
- B4 – External fire spread
- B5 – Access and facilities for the fire service

The principle aim of the Building Regulations is to ensure the health and safety of people in and around a building.

The 'requirements' set out broad objectives or functions, which the individual aspects of the building design and construction must set out to achieve. They are therefore often referred to as 'functional requirements' and are expressed in terms of what is 'reasonable', 'adequate' or 'appropriate'.

10.2.2 BS9991 and BS7974

In both new construction and upgrading existing buildings, the various aspects of fire precautions are interrelated and weaknesses in some areas can be compensated for by strengths in others. A higher standard under one of the areas might be of benefit in respect of one or more of the other areas. BS9991 provides a level of flexibility that allows the fire protection measures and the risks to be assessed to enable reasonable practical solutions to be designed.

BS9991 provides recommendations and guidance on the provision of measures to control or mitigate the effects of fire. The primary objective is to ensure that an adequate standard of life safety can be achieved in the event of fire in the building.

A secondary objective is to provide a level of protection for property and businesses against the impact of fire, e.g., in close proximity to residential buildings or as part of the same building or building complex. These can also have the effect of assisting the fire and rescue service and/or of providing environmental protection.

There are references throughout this British Standard to occupant safety, firefighter safety and property protection, to draw attention to the different issues these could raise. It is, however, important to be aware that provisions solely for life safety are unlikely to provide the full level of protection for buildings and property in a fully developed fire scenario.

BS7974 is intended to facilitate a fire engineered approach to buildings, to allow safety levels of designs to be compared and to provide a basis for the selection of appropriate fire protection systems, and to provide information and assessment methods to support the design, construction, management and operation of buildings.

10.2.3 Regulatory Reform (Fire Safety) Order

Once the buildings are occupied, the Regulatory Reform (Fire Safety) Order (RRO) becomes the controlling fire safety legislation.

The Order came into force on 1st October 2006 and revoked the existing Fire Precautions Act and the Workplace Regulations. Under this order it will be necessary for the owner/ occupier of the building to carry out and maintain a fire safety risk assessment.

The building management team will also be responsible under this order to ensure that the buildings' fire safety provisions are appropriately managed, maintained and tested over the whole life of the building.

10.2.4 Construction, Design and Management Regulations

Projects undertaken in the UK are subject to the requirements of the Construction (Design and Management) Regulations 2015 (CDM) or within the European Union, that particular country's interpretation of the European Union Directive.

This report defines the strategy for meeting the functional and performance requirements for fire safety in the finished building. It is intended to form part of the submission for approval under the Building Regulations, Part B (Fire safety). Where any conclusions or recommendations contained within this report specify particular materials, products or forms of construction these will have been assessed, in accordance with CDM Regulation 9 (duties for designers).

In the event that these involve significant residual risks or health and safety critical assumptions, this information will be made available to the CDM Coordinator. Where the architect or other consultants use all or part of this report to specify works, they are understood to be competent in alerting the Client, Principal Designers, Contractors and Building Occupier of issues arising under the CDM Regulations.

10.2.5 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 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 proposes to require physical changes to the building to meet the requirements of the Fire Safety Order, the building control body should make the applicant aware.

10.2.6 New London Plan

The London Plan is the statutory Spatial Development Strategy for Greater London prepared by the Mayor of London ("the Mayor") in accordance with the Greater London Authority Act 1999 (as amended) ("the GLA Act") and associated regulations.

The New London Plan was published by the Mayor in March 2021. It forms the statutory spatial development strategy for Central London. The recommendations of the London Plan are covered in the relevant fire strategy for the buildings and not in this document.

10.3 QDR Process

The QDR is a structured technique that allows the team to think of the possible ways in which a fire hazard might arise and establish a range of strategies to maintain the risk at an acceptable level. The fire safety design can then be evaluated quantitatively or qualitatively against the acceptance criteria set by the team.

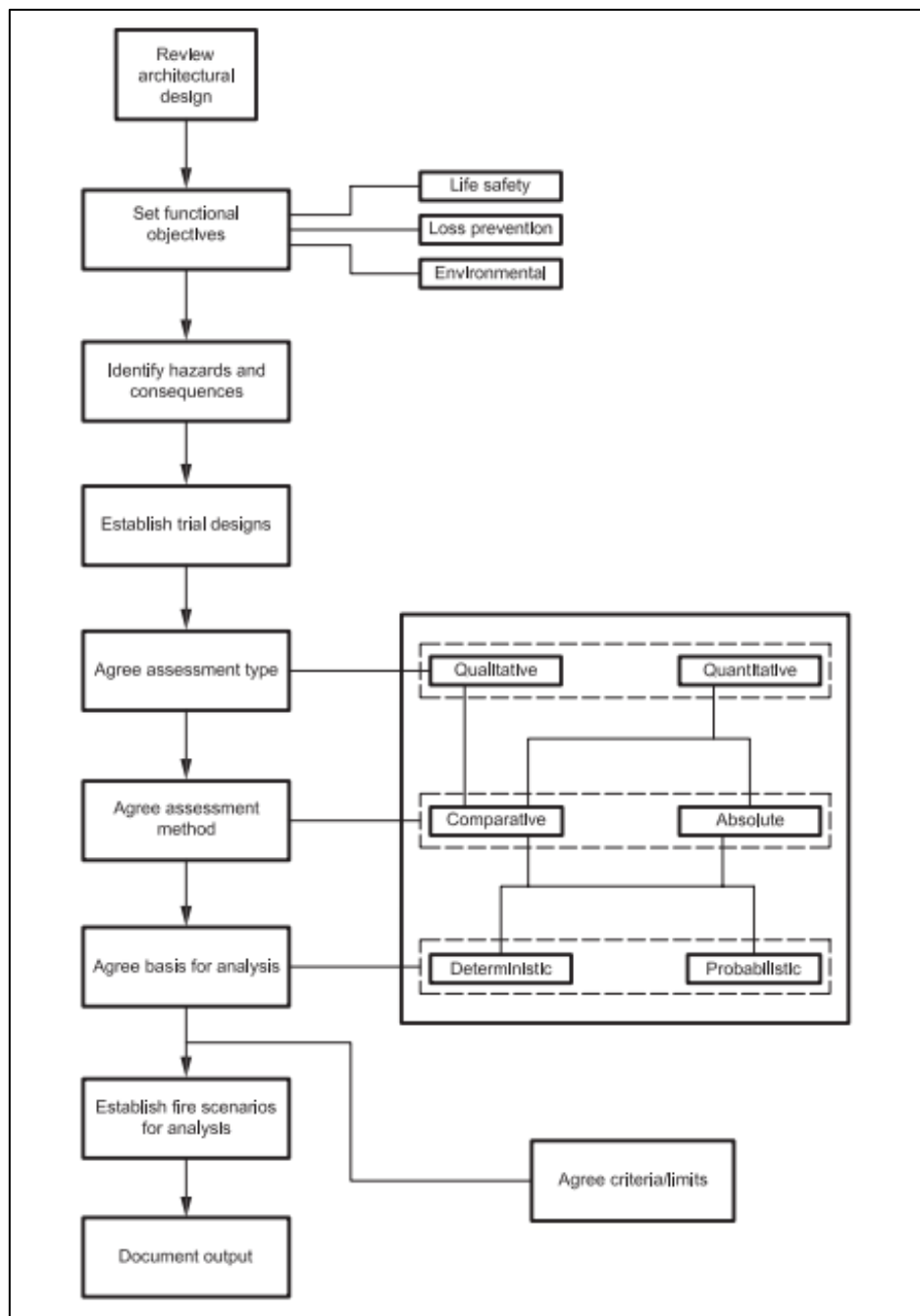


Figure 54 – QDR process

How this applies to this document is illustrated below:

1. Review of architectural design – A review that describes the project using schematic drawings, models etc., that outlines any aspects that may be significant in the fire safety strategy.
2. Functional objectives – Life safety, loss control, business continuation, environmental impact. This could be either single objectives or a combination of several.
3. Identify hazards and consequences – Analysis of all possible factors that could contribute to a fire in the building or the results thereof.
4. Establish trial designs – Consideration to fire protection systems that will support the functional objectives as well as the failure of these systems by a “what if” analysis.
5. Set acceptance criteria – Development of criteria to satisfy functional objectives.
6. Identify method of analysis – Either deterministic, probabilistic or qualitative.
7. Establish fire scenarios for analysis – QDR team to establish possible worst-case scenarios that should be used for analysis.
8. Document output.

10.4 Review of Architectural Design

The architectural design is reviewed at the early outline stage of scheme development to ensure that the fire safety measures and architectural design are developed in harmony.

10.4.1 Building Characteristics

Item	Building M
Number of storeys	Basement, Ground + 26 Storeys
General Dimensions	The greatest dimension of is 41.4m long and 28.6m wide. Building M also connects with Buildings L, N, P and Q via the podium at Level 2.
Nature of Construction	Concrete, mortar brick and reinforced concrete.
Geometry and interconnection of spaces	As per drawings produced by dRMM.
Internal subdivision of building	As per drawings produced by dRMM.
Normal circulation Routes	As per drawings produced by dRMM.
Escape routes	The building will be provided with two protected stairs. The occupants will escape from the apartments, into a protected corridor that leads to two protected stairs at all levels, therefore there are alternative escape routes throughout the buildings. Both protected stairs of the building will be provided with independent escape routes that ultimately lead to outside through a protected corridor on the ground floor. A firefighting shaft will be provided. The common escape corridor will be completely separated from any ancillary spaces.

Wall and ceiling linings	Wall and ceiling linings will meet the classifications in accordance with BS 9991.
Provision for dispersal of people from the vicinity of the building	The final exits of the buildings allow the dispersal of persons into public space, away from the building.
Possible fire and smoke spread routes	Corridors, openings and voids.
Proposed fire detection and fire alarm system	Residential – LD1 Automatic fire detection and alarm system with a minimum Grade D power supply, designed, installed and maintained in accordance with BS5839 Part 6. The system should be of Grade D1 if the apartments are to be rented accommodation and Grade D2 if they are to be owner occupied. Common Corridor– L5 Automatic fire detection and alarm system in accordance with BS5839 Part 1. Residential Amenity – L3 Automatic fire detection and alarm system in accordance with BS5839 Part 1. Residential Ancillary – L3 Automatic fire detection and alarm system in accordance with BS5839 Part 1.
Location relative to other buildings or site boundary	The west facade of Building M is surrounded by landscape and road. The south façade of Building M is approximately 10m from Building N at upper levels. The north façade of Building M is approximately 12m from Building L at upper levels. The east façade of Building M is approximately 47.9m from Building P at upper levels.
Any other factor that might influence the fire safety design	The building height (to the top-most occupiable floor) is approximately 64.35m.

Table 12 – Building Characteristic

10.4.2 Fire Hazards

Item	Fire hazards
Unusual fire hazards	None
Potential ignition sources	- Electrical (fluorescent lights, electrical extensions, switchboards, cooking, etc.). - Mechanical (maintenance, malfunctioning equipment etc.). - Heating equipment (Cooking stove, oven, cooking gas, water heater, incense, etc.).

Combustible contents and structure	- Typical residential apartments. - Ancillary areas (electrical / plant rooms).
Heat Release Rate	- Up to 570kW/m² (Residential) as per PD 7974-1.
Any other factor that might influence the fire safety design	None

Table 13 – Fire Hazards

10.4.3 Environmental Influences

Item	Environmental influences
Ambient noise levels	NA
Any other factor that might influence the fire safety design	No extreme weather condition exists nor are there prevailing weather conditions locally that are deemed likely to impact the design.

Table 14 - Environmental Influences

10.4.4 Occupant Characteristics

Item	Occupant characteristics
Number and distribution	568 occupants (based on accommodation schedule) + 60 occupants at L1 and 60 occupants at L19 = 688 occupants
Single or multiple tenancy of use	Multiple
Mobility, vulnerability and need for assistance	Disabled occupants
State of wakefulness	Asleep – Residential Awake – Amenity space and roof gardens
Familiarity with the building	Familiar
Social groupings	External ground space
Roles and responsibilities of key individuals	Management to assist with disabled occupants as required and agreed with a PEEP.
Commitment to an activity (e.g., eating in a restaurant)	Gathering in amenity space and roof gardens.
Presence of a focal point (e.g., stage)	NA
Any other factor that might influence the fire safety design	None

Table 15 –Occupants Characteristic

10.4.5 Management of Fire Safety

Item	Management
Quality and extent of continuing management control	Information will be provided (as outlined in Section R38 of Approved Document B) so that the person responsible for the buildings has all the information to enable them to: a. Understand and implement the fire safety strategy of the building. b. Maintain any fire safety system provided in the building. c. Carry out an effective fire risk assessment of the building.
Number of people on site responsible for the fire safety management	
Staff-to-occupant ratio	
Level of fire safety training	
Security arrangements that might conflict with evacuation strategy	
Level of control over work on site (e.g. hot works)	
Level of planning and adaptability for changes to risk on site	
Level of knowledge and understanding to implement the fire safety strategy	
developed	
Contacts for provision of additional information	
Any other factor that might influence the fire safety design	

Table 16 - Management of Safety

10.4.6 Firefighting

Item	Firefighting facilities
Fire-fighting Fire and rescue service response time	Local fire brigade to confirm.
Access for fire appliances	Fire tender access to main entrance of building via surrounding access roads.
Firefighting access to, safety within and safe egress from the building	The building is to be provided with a firefighting shaft that includes a firefighting stair, wet riser and a firefighting lift.
Water supplies	The wet riser will be supplied from a dedicated tank for the block as it contains floor plates over 50m in height. The sprinkler system will have a separate water tank.
Any other factor that might influence the fire safety design	None

Table 17 - Firefighting

10.4.7 Client requirements

Item	Details
Any commercialization of the space (e.g. mall areas)	Commercial units are separated from residential accommodations and are provided with independent exit routes.
Fire protection systems specified by client (e.g. sprinklers for loss control)	Not relevant to the buildings assessed.
Any other factor that might influence the fire safety design	None
Impact of fire on business continuity as set out in a business impact analysis (BIA) if available	NA

Table 18 - Client Requirements

10.5 Functional objectives

The functional objective of the fire safety design is specified below.

Life safety

The occupants of a building, firefighters and members of the public who are in the vicinity of a building can be put at risk by fire. The main life safety functional objectives are defined as design objectives below:

- a) The occupants are ultimately able to leave the building in reasonable safety or the risk to occupants is acceptably low.
- b) Common corridors allow the escape of occupants and enable fire-fighters to suppress the fire.
- c) The escape from high levels should be possible for the required time, by ensuring the escape stairs are clear of smoke.
- d) Firefighters can operate without undue risk to:
 - assist evacuation when necessary.
 - effect rescue when necessary.
 - prevent conflagration.
- e) Collapse does not endanger people (including firefighters) who are likely to be in or near the building.

10.6 Identify Fire Hazard and Possible Consequences

10.6.1 Hazards

A systematic review is conducted to establish the potential fire-related hazards within the building and their potential consequences. The following aspects have been considered:

10.6.1.1 Ignition sources:

- Electrical appliances
- Mechanical sparks
- Naked flames
- Fluorescent lights
- Electrical extensions
- Switchboards
- Cooking
- Mechanical operations
- Maintenance
- Malfunctioning equipment
- Cooking stove
- Oven

- Water heater
- Incense

10.6.1.2 Combustible contents:

- Furniture
- Packaging materials
- Appliances
- Combustible waste materials
- Textiles
- Flammable gases

10.6.1.3 Nature of the activities in the building:

- Cooking
- General residential activities
- Plant room activities for building operation

10.6.2 Consequences

The consequences of a particular fire hazard vary significantly depending upon the contents and construction of a building, the following are typical situations that might give rise to a fire scenario.

10.6.2.1 Cooking:

- Unattended cooking activity leads to ignition.
- Ignites material adjacent to cooker.
- Fire spreads across combustible materials surrounding cooker.
- Fire penetrates ceiling to floor above.
- Fire spreads to other rooms via open doors or door failure.
- Building and contents written off.

10.6.2.2 Malfunctioning appliance:

- Kitchen appliance containing combustible / flammable material has electrical malfunction that leads to ignition.
- Ignites combustible material adjacent to the appliance.
- Fire spreads across combustible materials within apartment.
- Fire penetrates ceiling to floor above.
- Fire spreads to other rooms via open doors.
- Building and contents are written off.

10.7 Establish Trial Fire Safety Designs

Fire protection system	Possible QDR considerations
Control on materials	Non-combustible materials in: - Construction - Linings
	Flame retardant materials in: - Furniture - Furnishings
Automatic suppression	Throughout building
	Extinguishing medium: Water

	Design standard: BS 9251 – Residential Design standard: BS EN 12845 – Non-residential units and ancillary accommodation that serves the residential which cannot be supplied by the residential system.
Detection	Residential – LD1 Automatic fire detection and alarm system with a minimum Grade D power supply, designed, installed and maintained in accordance with BS5839 Part 6. The system should be of Grade D1 if the apartments are to be rented accommodation and Grade D2 if they are to be owner occupied. Common Corridor– L5 Automatic fire detection and alarm system in accordance with BS5839 Part 1. Residential Amenity – L3 standard of fire detection and alarm. Residential Ancillary – L3 standard of fire detection and alarm. Design standard: BS 5839 Part 6 – Residential. Design standard: BS 5839 Part 1 – Non-residential. Design standard: BS 8629 Evacuation Alert Systems.
Structural protection and compartmentation	Structural Fire resistance: • 120 minutes Total travel distance from the furthest apartment at the highest storey to the final exit: • $10.5\text{m} + (10 \times 26.5)\text{m} + 13.8\text{m} = 289.3\text{m}$ Total travel time from the furthest apartment at the highest storey to the final exit (minimum descending walking speed: 0.1m/s in accordance with BS 7974-6 Table G.5 – Disabled subjects): • 48.2 minutes Compartment size: Varies, as per the design and in accordance with BS 9991. Location boundaries: To be discussed in the fire strategy. Passive fire protection systems: fire-resistant elements of structure, compartmentation, fire doors, passive fire protections systems and cavity barriers.
Automatic systems	Dampers: Interconnected with detection system. Automatic doors hold open devices (where provided) Automatic access control systems (where provided) Smoke fans Vents (e.g., AOV) Automatic fire sprinkler system Wet risers

Smoke control	Mechanical Smoke Extraction within dead ends for the main core because of extended travel distances. Also, the protected lift lobby will be ventilated to maintain tenability and keep stairs clear of smoke to ensure a safe egress route.
Alarm and warning systems	No automatic communal alarm system, only within apartments. Evacuation alert system for the fire service to operate – Residential. Communal alarm system – Non-residential.
Evacuation strategy	Stay-put evacuation – Residential. Simultaneous evacuation – Ancillary accommodations. As part of Policy D5, it is a requirement to provide a dignified means of escape for all occupants, therefore the buildings shall be provided with a lift that is suitable for evacuation purposes. The building management forms an integral part of the design and ongoing functionality of the building after occupation. The buildings will have a management team whose responsibilities will include ensuring the fire safety strategy is adopted and enforced. One of the responsibilities of this team will be to develop a management strategy for the building. This strategy will incorporate details of how the building satisfies the requirements of the Equality Act 2010. The management strategy should include information on staff training, how disabled occupants will be evacuated in the event of a fire and should identify key roles in ensuring they are assisted in a fire situation and will have to be developed by the building management ahead of the building handover.
Escape routes	Escape route and number: Two protected staircases will be used as escape route for each residential floor of the building. Travel distances from furthest apartment door to staircase lobby exceed 7.5m at some dead ends corridors with sprinkler protection in accordance with ADB, but corridors are to be ventilated mechanically to mitigate this. Exit width: Exits into the staircases shall be 850mm wide from each floor. At ground floor the staircase door and final exit door shall be the same width of the staircase. Staircase width: The firefighting staircase will have a clear width of 1100mm. Alternative protected staircase will have a clear width of a minimum of 1000mm. Refuges for disabled occupants: Not required for residential, however a protected lift lobby will be provided as a safe waiting area for disabled occupants. Lifts – 1 Firefighting Lift + 1 Lift for Evacuation will be provided.
First aid firefighting	Extinguishers to be provided as per BS 5306. Availability of trained staff: To be confirmed with management plan.

Fire service facilities	Access routes: The firefighting tender access will be provided via the surrounding streets and within the site to achieve 18m distance from the fire tender parking to the fire service point of entry.
	Rising mains: A wet riser main will be provided with an inlet to fill the suction tanks on the face of the building in an emergency.
	Firefighting shafts: A single firefighting shaft will be provided.
	Smoke extraction: Mechanical smoke extraction provided in the corridors of the building.
Fire safety management	Management plan: To be confirmed with the management team.
	Staff availability: To be confirmed with a management plan.
	Staff training: To be confirmed with a management plan.
	A third-party audit of procedures: To be confirmed with the management plan.
	Maintenance schedules: To be confirmed with a management plan.

Table 19 – Trial Fire Safety Designs

10.7.1 “What if” Analysis

As part of the hazard assessment process, an assessment of “what if” events should be made to identify system failures or foreseeable events that might have a significant influence on the outcome of the study.

“What if” event	Impact on fire safety	Further measures required?
Fire door (stair or apartment) propped open	The fire doors will be fitted with self-closers to prevent this in everyday use. However, should a stair or apartment door be left open, this is no different from the situation that will occur when the fire service is fighting a fire.	No
	It will be shown in the CFD modelling that the smoke extract system can keep the stair clear of smoke in this scenario.	
Combustible Displays introduced into sterile areas	Health and Safety displays will be shown in the main entrance lobby. There will be a defined management strategy for the building which will be adhered to, whose role will include ensuring the communal spaces remain sterile, or a fire risk assessment is conducted on any other materials present. There will be separation between sterile areas and furnished lobbies. If goods were placed in the common corridors, this would prevent the general use / access to the apartments, so unlikely that this would take place.	No

Failure in compartmentation	To prevent compartmentation failure, several checks will be put in place during the building construction. There will be regular site inspections conducted by Introba or another suitable contractor on the compartmentation, with issues identified to the client and / or contractor. Photographic evidence during installation.	No
	The construction and fire stopping will be carried out by competent persons with appropriate accreditations and experience.	
	Building Safety Regulator will also conduct inspections to ensure the compartmentation is built as designed.	
	There will be a management system in place to ensure any works carried out during the occupation of the buildings maintains the original compartmentation. The management will also ensure that adequate maintenance and monitoring of the installed compartmentation is completed and recorded.	
	If compartmentation does fail, the provision of sprinklers throughout the building will ensure the fire does not continue to grow beyond the area of origin. Should smoke spread through breaches in compartmentation this will be cold smoke which may result in an evacuation but will not propagate the fire to another location. If compartmentation fails between apartments, the fire could spread, however the stairs will remain smoke free and the ventilation system will limit the amount of smoke in the corridor. If compartmentation between the corridor and apartment fails, smoke could fill the corridor, however the stairs will remain smoke free.	
	The evacuation alert system will allow the fire service to initiate a partial / full evacuation should they require to.	
Power supply to smoke ventilation fails	There will be a dual power supply to all of the life safety equipment.	No
	There will be a maintenance strategy to maintain all equipment within the building.	

	The installation will be done in accordance with approved standards using approved materials and equipment to ensure component failure is minimized. There will be a standby fan that operates 100% of the required duty if the primary fan were to fail. There will be a maintenance strategy to maintain all equipment within the building. The doors to the staircases, lobbies and to the apartment entrances are on self-closers, therefore during means of escape there will be a limited amount of smoke that will spread into the corridor and worst-case scenario, some smoke could spill into the lobby and staircase, but will not be sufficient to prevent it from being used by other occupants. During firefighting, it would be expected that the evacuation alert system would be used to evacuate the building prior to undertaking the firefighting operations so that there is not a risk that the staircase could not be tenable for use by other residents.	
Sprinkler pump failure	Dual pump sets are provided to the sprinkler system, each with a connection to the electrical supply and to the secondary power supply in the event of mains failure. In the event of a water supply issue in the building, it will be unoccupiable and hence there will not be an issue of no water and apartments requiring sprinkler protection at the same time. There will be a maintenance strategy to maintain all equipment within the building. The fire resistance of the structure will not be reduced, as the performance specification does not require a sprinkler system to reduce the exposure of fire. Increased fire size but this would likely cause window failure (as outlined / advised in the SCA guide). Therefore, it is assumed the mechanical ventilation system in the common corridors would be capable of protecting the staircase from smoke ingress with an unsprinklered apartment fire.	No

Sensitive detection systems adversely affected by movement of ventilation air	There will be no aspirating detection within the common corridors or the apartments.	No
The fire is located where it blocks an exit	The building will operate under a stay-put policy and so a fire blocking a final exit will not block the escape of occupants as they are safe in their apartments due to the level of compartmentation provided. <u>Residential:</u> Should occupants wish to evacuate, the alternative protected escape route will lead directly outside at ground floor level. <u>Ancillary spaces:</u> Ancillary accommodations that are connected to the residential core will be provided with a vented lobby. Occupants from these ancillary spaces will either escape directly to outside or escape into the protected lobby/stair that leads directly to outside.	No
Management fails to implement fire safety procedures	There will be a defined management strategy for the buildings which will be adhered to.	No

Table 20 - "What if" Analysis

10.7.2 Common Mode Failures

Further on Section 3.5.1, a common mode analysis is required to assess the failure effects on fire protection measures that effect another measure.

Failure	Effect on Another Measure	Solution
Power Supply	- Sprinkler System - Automatic Detection System - Smoke Ventilation - Wet Risers	- Independent backup power supply. - Ensure maintenance by relevant standards.
Detection System	- Delayed Evacuation	- Ensure maintenance by relevant standards.
Smoke Extraction	- Delayed / Difficult Evacuation - Difficulties with firefighting - False alarms from the detection system	- Ensure maintenance by relevant standards.
Sprinkler System	- Uncontrolled fire leads to greater demand for firefighting measures	- Dual pump supply. - Ensure maintenance by relevant standards.
Open Fire Door	- Fire spread beyond the origin	- Ensure maintenance by relevant standards.

Table 21 - Common Mode Failure

10.8 Set acceptance criteria

Acceptance that the functional objectives set out in Section 3.3 have been met requires a set of criteria against which an assessment can be measured. The acceptance criteria are set as appropriate to the specific scenario under consideration, and it should be recognized that elimination of all risk from the effects of a fire is an unrealistic expectation. Dependent upon the type of assessment undertaken acceptance criteria may be an absolute or comparative numerical value. They may also be a qualitative descriptor as part of a narrative assessment. Figure 55 below illustrates the process of setting up the required criteria.

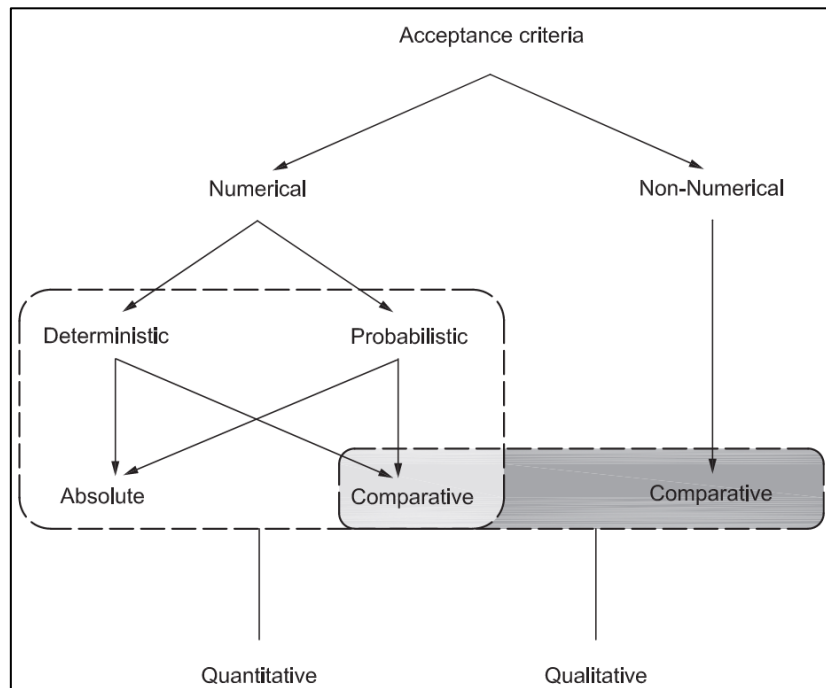


Figure 55 – BS 7974 (Relationship for setting quantitative and qualitative acceptance criteria)

For the purposes of determining whether the building regulations are suitable to apply to this building, a qualitative criterion by means of argument is best suited for this application.

10.9 Identify Method of Analysis

At QDR stage, the method of analysis should be agreed. All parties should be made aware of the advantages and disadvantages of each method so that an informed decision can be made. They should also be made aware that many assumptions made in the analysis might not always be valid in every circumstance.

The analysis that can be applied for this building, can be of a qualitative nature.

10.10 Establish Fire Scenarios for Analysis

The number of possible fire scenarios in even a relatively simple building can become very large and it is not feasible (or necessary) to assess the effects of them all. Therefore, when carrying out an FSE analysis, the QDR team discuss and agree one or more reasonable worst-case scenarios for detailed evacuation.

Depending upon the functional and design objectives of the FSE analysis the definition of a fire scenario should consider some or all the following factors:

- a) Design fire.
- b) Fire location.
- c) Occupant characteristics.

The detailed analysis and quantification of fire scenarios for a specific building should be limited to the most significant fire scenarios.

The characterization of a fire scenario for analysis purposes includes a description of the following, where appropriate:

1. Type of fire.
2. Natural ventilation conditions.
3. Performance of each of the safety measures.
4. Type, size, and location of the ignition source.
5. Distribution and type of fuel.
6. Fire load density.
7. Fire suppression.
8. State of doors (i.e., Are the doors open or closed).
9. Breakage of windows.
10. Mechanical building ventilation system.

The possible consequences of each fire scenario should also be determined.

The two main quantities used to describe design fires are the heat release rate and temperature-time profiles. The most widely used pre-flashover design fires are t^2 fires, whereas a host of empirical correlations are available for post-flashover design fires.

10.10.1 Scenario 1

A fire scenario is considered at Level 1 for the Screening Room with a size of 146.23m². The fire is assumed to be sprinkler-controlled.

Type of fire

Class A Fire - Ordinary Combustible Fire.

Natural ventilation conditions

Openable windows with dimensions to be confirmed if the analysis is performed.

Performance of each of the safety measures

- L3 Fire Detection System
- Sprinkler System
- 60 Minute Compartment Walls
- 30 Minute Fire Rated Smoke Sealed Self Closing Door to protected corridor

Type, size, and location of the ignition source

Screening equipment with electrical faults.

Distribution and type of fuel

Furniture and appliances throughout the space.

Fire load density

From BS 7974-1, Table A.4 and A.5, the design fire has the following characteristics:

Feature	Value
Screening area	146.23m ²
HRR per unit area	320kW/m ²
Fuel controlled maximum HRR	1MW (sprinkler controlled)
HRR growth rate	0.012kW/s ² (Medium growth)
Total fire load density per unit area	780MJ/m ²
Total fire load	2527MJ

Table 22 - Scenario 1 Design Fire

State of doors

Doors to the corridor are to be closed once the occupant escapes and held open when the fire department initiates firefighting.

10.10.2 Scenario 2

A fire scenario is considered at Level 2 for an apartment of Block M with a size of 50.4m². The fire is assumed to be sprinkler-controlled.

Type of fire

Class A Fire - Ordinary Combustible Fire.

Natural ventilation conditions

Openable windows with dimensions to be confirmed if the analysis is performed.

Performance of each of the safety measures

- LD1 Grade D Fire Detection System.
- Sprinkler System.
- 60 Minute Compartment Walls.
- 30 Minute Fire Rated Smoke Sealed Self Closing Door to protected corridor.

Type, size, and location of the ignition source

30cm Pan fire in kitchen on cooker.

Distribution and type of fuel

Furniture and appliances throughout the apartment.

Fire load density

From BS 7974-1, Table A.4 and A.5, the design fire has the following characteristics:

Feature	Value
Apartment area	50.4m ²
HRR per unit area	320kW/m ²
Fuel controlled maximum HRR	1MW (sprinkler controlled)
HRR growth rate	0.012kW/s ² (Medium growth)
Total fire load density per unit area	780MJ/m ²
Total fire load	2527MJ

Table 23 - Scenario 1 Design Fire

State of doors

Doors to the corridor are to be closed once the occupant escapes and held open when the fire department initiates firefighting.

10.11 Conclusions and Recommendations

The Building Regulations are deemed to be satisfactory to encapsulate the possible fire scenarios that could occur at the building height in this design. The type of fire that could occur is not influenced by the building heights.

Therefore, it is deemed that the proposed building designs satisfy the functional requirements of the building regulations where they follow this document and as the designs progress it will be ensured that a high level of fire safety will be built into the design.

11 Appendix B – Gateway One Fire Statement

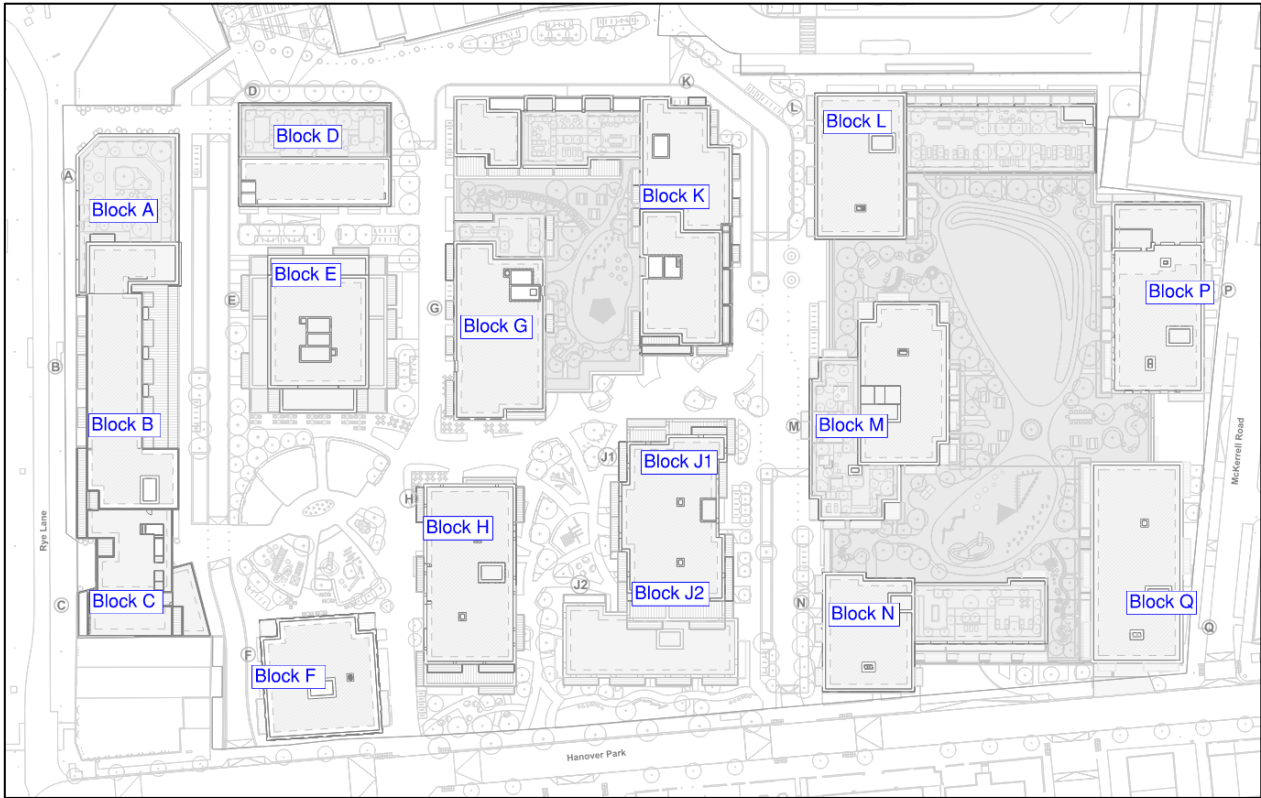
Application information	
1. Site address line 1	Aylesham Centre, London
Site address line 2	Hanover Park,
Site address line 3	
Town	London
County	
Site postcode (optional)	SE15 5EW
2. Description of proposed development including any change of use (as stated on the application form):	Demolition of existing buildings and phased redevelopment to provide a replacement supermarket and associated service yard and car parking (Use Class E(a)); flexible retail, leisure (including drinking establishment), and commercial accommodation (Use Class E/Sui Generis); dwellings (Use Class C3); landscaping; and associated works.
3. Name of person completing the fire statement (as section 15.), relevant qualifications and experience. Guide: no more than 200 words	Cheri Ho – Fire Engineer Cheri is a Fire Engineer with 3 years' experience and is an Associate Member of the Institution of Fire Engineers (IFE). She has detailed knowledge of Approved Document B (ADB) and BS 9991 and a robust understanding and experience of mixed-use residential developments including early stage and construction design stages. Cheri has worked on many similar schemes in the past, incorporating elements such as smoke control and firefighting facilities into designs, as well as experience working on buildings of over 18m in height. Andy Baker – Associate Fire Engineer Andy has over 15 years' experience working as a designer/consultant within the fire life safety sector. He has extensive experience designing solutions for high- and low-rise residential developments, commercial properties including high rise offices, warehousing, and retail spaces as well as enclosed and multi-level underground car parks. He has worked on many projects applying guidance from Approved Document B and the British Standards from conception to completion and is also a qualified Fire Risk Assessor. Simon Burch – Associate Principal of Fire Engineering Simon is an Associate Principal of Fire Engineering at Introba, registered with the Engineering Council and a Member of the Institution of Fire Engineers (MiFireE) with a wealth of experience on a variety of high-rise residential developments for major housing clients across London and the South-East. He is the lead author of fire strategies and responsible for all stages of the fire engineering design from the initial client contact through the tendering phase, across construction and the ongoing management and maintenance of fire safety systems and passive fire protection.
4. State what, if any, consultation has been undertaken on issues relating	Internal consultation has been completed between the design team. External consultation will be carried out as the detailed design progresses.

to the fire safety of the development; and what account has been taken of this.

•
Guide: no more than 200 words

5. Site layout plan with block numbering as per building schedule referred to in 6.
(consistent with other plans drawings and information submitted in connection with the application)

Site layout plan is:
inserted in the form



The principles, concepts and approach relating to fire safety that have been applied to the development

6. Building schedule

Site information				Building information			Resident safety information		
a) block no. as per site layout plan above	b) • block height (m) • number of storeys excluding those below ground level • number of storeys including those below ground level	c) proposed use (one per line)	d) location of use within block by storey	e) standards relating to fire safety/ approach applied	f) balconies	g) external wall systems	h) approach to evacuation	i) automatic suppression	j) accessible housing provided
Building ABC	TF FFL – • 21.17 (m) • 7 • 7	residential flats, maisonettes, studios	Ground, 1 st - 6 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building D (Office)	TF FFL – • 21.3 (m) • 6 • 6	office	Ground, 1 st - 5 th	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes- commercial sprinklers, full	N/A non resi
Building E	TF FFL – • 33.85 (m) • 11 • 11	residential flats, maisonettes, studios	Ground, 1 st - 10 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building F	TF FFL – • 17.1 (m) • 6 • 6	residential flats, maisonettes, studios	Ground, 1 st - 5 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building G	TF FFL – • 37.15 (m) • 12 • 12	residential flats, maisonettes, studios	Ground, 1 st - 11 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building H	TF FFL – • 26.88 (m) • 9 • 9	residential flats, maisonettes, studios	Ground, 1 st - 8 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)

Building J1	TF FFL – • 49.43 (m) • 16 • 16	residential flats, maisonettes, studios	Ground, 1 st - 15 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building J2	TF FFL – • 16.2 (m) • 6 • 6	residential flats, maisonettes, studios	Ground, 1 st - 5 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building K	TF FFL – • 31.51 (m) • 10 • 10	residential flats, maisonettes, studios	Ground, 1 st - 9 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building L	TF FFL – • 33.25 (m) • 12 • 13	residential flats, maisonettes, studios	Basement, Ground, Upper Ground, Mezzanine, 1 st -9 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building M	TF FFL – • 64.35 (m) • 21 • 22	residential flats, maisonettes, studios	Basement, Ground, Mezzanine, 1 st -19 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building N	TF FFL – • 38.55 (m) • 13 • 14	residential flats, maisonettes, studios	Basement, Ground, Upper Ground, 1 st - 11 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building P	TF FFL – • 36.4 (m) • 12 • 13	residential flats, maisonettes, studios	Basement, Ground, Upper Ground, 1 st - 10 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)
Building Q	TF FFL – • 16.7 (m) • 6 • 7	residential flats, maisonettes, studios	Basement, Ground, Upper Ground, 1 st - 4 th	Approved document B vol 1	class A2-s1, d0 or better	class A2-s1, d0 or better	stay put	yes- residential sprinklers, full	M4(2) & M4(3)

Roof/podium gardens in various blocks	TF FFL – • Varied • 1 • 1	other residential accommodation	Roof/podium level	Approved document B vol 1	no balconies	class A2-s1, d0 or better	simultaneous	none	none
Commercial gym in Building K	TF FFL – • 4 (m) • 2 • 2	flexible use	Ground Level 1 –	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes-commercial sprinklers, full	N/A non resi
Supermarket sales areas	TF FFL – • 3.1 (m) • 2 • 2	shop	Ground Level 1 -	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes-commercial sprinklers, full	N/A non resi
Supermarket car park & service yard	TF FFL – • 3.1 (m) • 1 • 2	car parking	Basement Ground -	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes-commercial sprinklers, full	N/A non resi
Workspace units in Buildings E, G and K	TF FFL – • 0 (m) • 1 • 1	office	Ground	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes-commercial sprinklers, full	N/A non resi
F&B in Buildings E, F, G and H	TF FFL – • 0 (m) • 1 • 1	restaurant, cafe, hot food take-away, drinking establishment	Ground	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes-commercial sprinklers, full	N/A non resi
Shops in Buildings A/B/C, F, H, J1, K, L and N	TF FFL – • 0 (m) • 1 • 1	shop	Ground	Approved document B vol 2	no balconies	class A2-s1, d0 or better	simultaneous	yes-commercial sprinklers, full	N/A non resi

7. Specific technical complexities

Explain any specific technical complexities in terms of fire safety (for example green walls) and/or departures from information in building schedule above

Guide: no more than 500 words

- This Fire Statement is based on the guidance in Approved Document B (ADB), which has been developed to ensure the highest standard of fire safety is designed into the building development at an early stage of design.

- Where there are travel distances within the common corridors that are extended beyond the recommendations of Approved Document B, to mitigate the extended travel distances, a 0.6m² mechanical smoke shaft will be provided at the dead end to protect the staircase from smoke ingress. At a later stage of design, a Computational Fluid Dynamics (CFD) assessment will be required to validate the smoke venting strategy for the block in accordance with the guidance from the Smoke Control Association: (SCA) Guidance on Smoke Control to Common Escape Routes in Apartment Buildings (July 2020).

- Where the final exit routes from the stairs do not lead directly to the outside, ADB requires that any discharge paths from the staircase must be along a protected route. Where this protected route has any access into ancillary areas (i.e. stores, cupboards) in a two-stair building, it should be via a protected ventilated lobby.
- Where risers are accessible from the ground floor fire service access route in cores over 18m in height, they will be enclosed in 120 minutes fire resistance with upgraded FD120S doors.
- Where green roofs are provided, 500mm wide fire breaks would be required along the perimeter edge in accordance with GRO Fire Risk Guidance and DCLG Fire Performance of Green Roofs and Walls.

8. Issues which might affect the fire safety of the development

Explain how any issues which might affect the fire safety of the development have been addressed.

Guide: no more than 500 words

- Residential apartments will adopt a stay put evacuation procedure in that only the particular apartment that has a fire in it is immediately evacuated. The Fire Service will carry out evacuation of the other apartments if necessary.
- The residential amenity, car park, ancillary accommodations and commercial units on site will be considered completely independent of the residential elements. These areas will adopt independent simultaneous evacuation procedures.
- The residential common corridors at the upper levels will be provided with smoke ventilation in accordance with ADB to provide tenable conditions for means of escape and firefighting operations.
- Most residential buildings (except Buildings F, J2 and Q) are over 18m in height and will therefore be provided with two stairs. Although Building Q does not exceed 18m in height, it is also provided with two stairs due to the different management for this Market Sale building. For these buildings, independent sterile final exit routes leading directly to outside will be provided at the ground floor, and adjacent accommodations will be separated from the final exit route via protected lobbies (that will also be smoke vented lobbies for accommodations with special fire hazards).
- Buildings F and J2 are single-stair buildings as they do not exceed 18m in height. The final escape routes of these buildings will not be connected to any ancillary accommodations.
- Building D is an office building that is over 11m in height, therefore two stairs will be provided. Independent sterile final exit routes leading directly to outside will be provided at the ground floor.
- All apartments and duplexes will be provided with a fire alarm and detection system in accordance with BS 5839 Part 6. The car park, commercial units and the office building will be provided with a fire alarm and detection system in accordance with BS 5839 Part 1.
- Buildings F, J2 and Q are over 11m in height and not exceeding 18m, therefore the elements of structure will achieve 60 minutes fire resistance. Buildings A, B, C, D and H are over 18m in height and not exceeding 30m, therefore the elements of structure will achieve 90 minutes fire resistance. All other buildings are over 30m in height and will achieve 120 minutes structural fire resistance.
- Where elements of structure support a building above, they should be provided with the structural fire resistance to at least that required for the building they support.
- For residential buildings, all floors will be designed as compartment floors and will achieve fire resistance periods same as elements of structure.
- Apartments and duplexes will be enclosed in 60 minutes fire resistance with FD30S doors.
- Most residential buildings (except Buildings F, J2 and Q) and the office Building D are over 18m in height, therefore they will be provided with a firefighting shaft that shall incorporate a firefighting lift. Additionally, a secondary lift will be provided that shall be suitable to be used for evacuation purposes. Buildings J2, Q and F shall not require a firefighting shaft due to the building height, but will be provided with a lift that shall be suitable to be used for evacuation purposes.
- In these buildings, the firefighting staircases will be enclosed in 120 minutes fire resistance with FD60S self-closing doors. The firefighting lift shaft and the lift shaft for evacuation should have a fire resistance of 120 minutes with FD60 landing doors.
- For most buildings except Buildings F, J2 and Q, the lift for evacuation purposes will achieve the same fire resistance as the firefighting lift. For Buildings F, J2 and Q, the lift for evacuation purposes will achieve the same fire resistance as the elements of structure with FD30 landing doors.
- Although Building Q does not exceed 18m in height, it will be provided with two stairs for management reasons. For Building Q, office Building D and all other residential buildings (except Buildings F and J2), the secondary stair will be enclosed in the same fire resistance as the elements of structure with smoke sealed self-closing fire doors achieving at least half of the resistance of the wall. Buildings F and J2 shall not require a secondary stair.

- For Buildings F, J2 and Q, risers will achieve 60 minutes fire resistance with FD30 doors. For Buildings A, B, C, D and H, risers will achieve 90 minutes fire resistance with FD60 doors. Risers in all remaining blocks will achieve 120 minutes fire resistance with FD60 doors.
- For risers in all buildings, if provided in the lift lobby, the riser doors will be provided with smoke seals.
- For most residential blocks (except Buildings F, J2 and Q) and office Building D, risers accessible from the ground floor fire access route will be enclosed in 120 minutes fire resistance with FD120S doors. For Buildings F, J2 and Q, risers accessible from the ground floor final escape route will be enclosed in 60 minutes fire resistance with FD30S doors.
- The commercial units and car park will be compartmented from residential accommodations by the same level of fire resistance as the elements of structure.
- All apartments and duplexes will be provided with sprinklers in accordance with BS 9251. The ancillary accommodations, storage and plant facilities on site will be provided with sprinklers in accordance with BS 9251 or BS EN 12845 depending on the size and use of the accommodations.
- The car park and the commercial spaces will be provided with sprinklers in accordance with BS EN 12845.
- The podiums and roof gardens are open spaces which do not require sprinkler protection.
- The car park will be provided with either natural smoke ventilation or mechanical smoke ventilation. For natural ventilation in the case of fire, there will be openings equating to 2.5% of the car park area, with at least half of them located on opposing walls or at ceiling level. For a mechanical ventilation system, there will be a minimum of 10 air changes per hour during fire conditions. The car park will also be provided with an automatic fire detection and alarm system designed and installed in accordance with BS 5839 Part 1 and be a minimum of L5 standard.
- As all residential buildings are over 11m in height and the office building D is over 18m in height, all materials within the external wall should achieve European Classification in A2-s1,d0 or Class A1 in accordance with Regulation 7(2). Although the commercial units are below 11m in height, they are within the apartment buildings and will therefore achieve European Classification in A2-s1,d0 or Class A1 in accordance with Regulation 7(2).
- External wall construction that is perpendicular to the stair core within 1.8m of the staircase should be fire rated equal to that of the fire protection to the stairs.
- Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. Most other residential buildings (except Buildings F, J2, K and Q) and office Building D exceed 18m in height but do not have a floor area over 900m², therefore these buildings will be provided with one firefighting shaft in accordance with Approved Document B. Buildings F, J2 and Q are below 18m in height and are therefore not required to be provided with a firefighting shaft.
- Block M is over 50m in height, therefore it will be provided with a wet riser in the firefighting shaft. Buildings F, J2 and Q do not require a firefighting shaft, however, dry risers will be provided in these buildings to satisfy the hose laying distances. For all other blocks, they will also be provided with dry risers in the firefighting shafts.
- The wet / dry riser inlets will be located on the building façade and be within 18m of the fire service appliance parking location.
- All parts of the floor plates will be covered within 60m (or 45m in the case of F, J2 and Q) when measured along a suitable route for laying a hose from a wet / dry riser outlet located in the staircase.
- The supermarket will be provided with dry risers located within a protected stair to achieve the hose laying distance.
- The duplexes and other commercial units and ancillary accommodations accessed from the ground level will be provided with access to either at least 15% of the perimeter of the unit, or 45m hose coverage to the furthest point of the floor plate from the parking of the fire tender.
- The basement car park and service yard will be provided with a smoke ventilation system in accordance with ADB.
- The firefighting shaft in the office Building D will be provided with a smoke ventilation system in accordance with ADB and BS 9999.
- Existing public hydrants will be provided within 100m of the wet / dry riser inlet. The current proposal is shown in Section 14. To ensure sufficient coverage, additional hydrants will be provided within 90m of the wet / dry riser inlet in accordance with ADB.
- Each life safety system will be provided with a secondary power supply which will activate in the event of failure of the main supply.
- All residential buildings except Buildings F, J2 and Q are over 18m in height, therefore an emergency evacuation alert system will be provided.
- All residential buildings are over 11m in height, therefore they are required to be provided with a secure facility to store information about the building for use by the fire service during an incident.

9. Local development document policies relating to fire safety

Explain how any policies relating to fire safety in relevant local development documents have been taken into account.

Guide: no more than 500 words

- Consideration has been given to the London Plan dated March 2021. The recommendations in Policy D5 (Inclusive Design) and Policy D12 (Fire Safety) have been addressed.

Emergency road vehicle access and water supplies for firefighting purposes

10. Fire service site plan

Explanation of fire service site plan(s) provided in 14. including what guidance documents have informed the proposed arrangements for fire service access and facilities?

Guide: no more than 200 words

- Fire Service access has been provided for fire personnel access and a water supply to within reasonable distance of the building entrances in accordance with Approved Document B.

- Fire tender access routes are shown to demonstrate access for the fire appliance to within 18m of the wet / dry riser inlets is provided at the core entrances. This is shown on the ground floor plan referenced in Section 14.

- As the residential accommodations will adopt a stay put policy there is no defined assembly point for residential occupants.

- Buildings ABC and K have a storey that exceeds 18m in height and a floor area over 900m², therefore they will be provided with two firefighting shafts. All other blocks (except Buildings F, J2 and Q) exceed 18m in height but do not have a floor area over 900m², therefore these blocks will be provided with one firefighting shaft in accordance with Approved Document B.

- Building M is over 50m in height, therefore it will be provided with a wet riser in the firefighting shaft. Buildings F, J2 and Q do not require a firefighting shaft, however, dry risers will be provided in this block to satisfy the hose laying distances. For all other blocks, they will also be provided with dry risers in the firefighting shafts.

- A lift designed for evacuation purposes will be provided for all blocks to provide a dignified escape for disabled occupants within the building.

- Existing fire hydrants are to be provided within 100m of the wet / dry riser inlet locations and the proposed arrangement is acceptable as shown on the ground floor plan referenced in Section 14. To ensure sufficient coverage, additional hydrants will be provided within 90m of the dry riser inlet in accordance with ADB.

11. Emergency road vehicle access

Specify emergency road vehicle access to the site entrances indicated on the site plan

Guide: no more than 200 words

- As mentioned in Section 10, fire tender siting position has been completed to show the route the fire appliance would take to the site. This has been completed and assessed in accordance with Approved Document B and London Fire Brigade's Guidance Note 29.

Is the emergency vehicle tracking route within the site to the siting points for appliances clear and unobstructed?

yes

12. Siting of fire appliances

Guide: no more than 200 words

- The vehicle access route is being designed to meet the requirements for a pump appliance as described in London Fire Brigade – Guidance Note 29.

13. Suitability of water supply for the scale of development proposed

Guide: no more than 200 words

- Existing fire Hydrants will be provided within 100m of the wet / dry riser inlet locations as currently shown on the plans referenced in Section 14. To ensure sufficient coverage, additional hydrants will be provided within 90m of the dry riser inlet in accordance with ADB.

Nature of water supply:

hydrant- public

Does the proposed development rely on existing hydrants and if so are they currently usable / operable?

yes

14. Fire service site plan

Fire service site plan is:

inserted in the form

- Existing fire Hydrants will be provided within 100m of the wet / dry riser inlet locations as currently shown on the plans referenced in Section 14. To ensure sufficient coverage, additional hydrants will be provided within 90m of the dry riser inlet in accordance with ADB.



Fire statement completed by	
15. Signature	Cheri Ho
16. Date	05/12/2024