



Developed for:
Citystyle Fairview VQ LLP



Outline Fire Safety Strategy

Victoria Quarter
New Barnet

Issue 03
20 October 2021

Outline Fire Safety Strategy

Victoria Quarter
New Barnet

Project Reference: AF2076
Client: Citystyle Fairview VQ LLP

Issue	Date	Description	Author	Checked	Approval
01	20.10.2021	First issue for design team review	CA	FH	HMD
02	26.05.2021	Report updated to incorporate Design Team comments	CA	FH	FH
03	24.06.2021	Report updated for Planning	CA	FH	FH
04	20.10.2021	Updated to for GLA	CA	FH	FH

This report should not be divulged to any other parties without the approval of the client for whom it was produced. It should not be manipulated, abridged or otherwise presented without the written consent of Ashton Fire Ltd. In the event that such permission is sought and agreed, and the report is copied; then it must be copied in its entirety.

Ashton Fire shall have no duty of care beyond that owing to the Client. Under no circumstances shall Ashton Fire be liable for any reliance by any party, other than the Client, on the information contained within this report. Nothing in this report confers or purports to confer on any third party, any benefit or the acceptance of any third-party liability by virtue of the Contracts (Rights of Third Parties) Act 1999.

This report is subject to Ashton Fire’s standard terms and conditions and is issued Commercial in Confidence.

CA	Ceranda Argue BSc BSc(Hons) MIEI	Senior Fire Engineer
FH	Felipe Herrera BSc MSc CEng MIFireE MSFPE	Associate Director
HMD	Harry McDaid BSc BSc(Hons) AIFireE MIEI	Director

The checker has provided an internal review of the technical content of the report.
The approver confirms the report has received quality assurance in accordance with the principles of ISO 9001 and authorises external release of the document on behalf of Ashton Fire.

EXECUTIVE SUMMARY

Ashton Fire have been commissioned by Citystyle Fairview VQ LLP to provide fire safety consultancy services for the proposed Victoria Quarter residential development located on land formerly known as British Gas Works, Albert Road, New Barnet, Barnet, EN4 9SH.

This Outline Fire Safety Strategy (OFSS) has been developed to support the pre-planning design and is intended for co-ordination purposes with the wider design team only. This document outlines the various fire safety provisions required within the development that needs to be incorporated within the wider design.

This document does not purport to be a detailed design document and is not intended to be submitted as part of the building regulations application; a separate Detailed Fire Safety Strategy (DFSS) report is required to support the final design post planning.

This outline fire safety strategy has been developed to demonstrate an equivalent level of safety commensurate with the recommendations Approved Document B and/or BS 9991. This has been achieved through compliance with the prescriptive recommendations for life safety through the application of British Standard 9991 (BS 9991) in the first instance.

Specific property protection measures have not been developed within the strategy, however, the features included for life safety will, to some extent, contribute to property protection and continuity of use following a fire.

Apart from where noted in this report, the design for the residential blocks of flats will be in accordance with the recommendations of BS9991. To facilitate ease of review, the key fire safety systems are outlined in Summary Table 2.

The project involves the redevelopment of the site to provide 544 residential units (Use Class C3) within 13 buildings ranging from 4 to 8 storeys, with 267.1sqm of retail/commercial space and 112.7sqm of community space (Use Class A1/A2/A3/A4/B1/D1/D2) at ground floor, new public realm with communal landscaped amenity areas, alterations and additions to existing highways arrangements plus the removal of existing elevated footbridge and creation of new pedestrian routes, 334 car parking spaces (including car club and accessible provision) with basement and surface level provision, secure cycle parking, servicing and other associated development. This outline report is applicable to the fire safety requirements for the residential apartments and basement car park. An overview summary for each block of flats is provided in Summary Table 1.

A double height commercial unit will be provided at ground floor level in Block J1, residential accommodation is provided above from Level 2-4. This fire strategy is for the shell and core of the commercial unit only.

The flats will have a defend-in-place evacuation strategy, otherwise known as 'stay-put-policy', whereby, in the event of a fire, only the flat of fire origin will receive a signal to evacuate.

The communal corridors within the block of flats are required to be ventilated by an appropriate smoke control ventilation system.

The stairs serving the blocks of flats shall be provided with a natural automatic smoke ventilation system in the form of an automatic openable vent (AOV) positioned at the head of the stair. A mechanical smoke ventilation system (MSVS) will be provided in Block F4 to support the residential lobby design at ground floor level. An MSVS will also be provided in Block A to support the extended travel distances in the common corridors.

In some of the blocks of flats (see summary table 1) the residential accommodation is accessed from an external balcony, smoke ventilation is only required within the stair in these buildings.

All blocks are single stair buildings.

Access for fire and rescue service appliances will be provided within 18m of the dry riser inlet for each block of flats and any point of the floor plate should be within 60m of the dry riser outlet based on the sprinkler system. Suitable water supplies will be provided around the site via the fire hydrant system.

Summary Table 1: Overview of the Residential Blocks at Victoria Quarter

Block	Number of Storeys	Height to finished floor of top occupied floor.	Structural Fire Resistance (minutes)	Sprinkler (Y/N)	External Balcony Approach to Flat	Connected to Basement Car park (Y/N)
Block A	8 (G+7)	22.05 m	90	Y	N	N
Block B1	7 (G+6)	18.9m	90	Y	N	Y
Block B2	6(G+5)	15.75m	60	Y	N	Y
Block C1	7 (G+6)	18.9 m	90	Y	N	Y
Block C2	7(G+6)	18.9m	90	Y	N	Y
Block D1	7(G+6)	18.9m	90	Y	N	Y
Block D2	7(G+6)	18.9m	90	Y	N	Y
Block E	7 (G+6)	18.9m	90	Y	Y	N
Block F4	7(G+6)	18.9m	90	Y	N	N
Block F3	6(G+5)	15.75m	60	Y	N	N
Block F2	6(G+5)	15.75m	60	Y	N	N
Block F1	5(G+4)	12.6m	60	Y	N	N
Block G	5(G+4)	12.6m	60	Y	N	N
Block J1	5(G+4)	12.6m	60	Y	Y	N
Block J2	5(G+4)	12.6m	60	Y	Y	N
Block H	4(G+3)	10.45m	60	N	Y	N

Note: Building heights have been calculated on the basis of applying a floor to floor height of 3.15m

Summary Table 2 – Fire safety systems

Item	Details	Report Ref
Detection and alarm	<p>All flats will be provided with a Grade D1, LD1 system to conform to BS 5839-6.</p> <p>The communal areas within the block of flats will be provided with an L5 system conforming to BS 5839-1.</p> <p>The ancillary areas will be provided with a minimum L2 system conforming to BS 5839-1.</p> <p>In accordance with Table 7 of BS 9999, areas with a B3 risk profile (Commercial Unit) are required to have a minimum of L2 detection and alarm system designed and installed in accordance with BS 5839-1.</p> <p>An L3 system in accordance with BS 5839-1 should be provided in the basement car park.</p>	<p>3.1</p> <p>3.1.1</p>
Sprinkler system	<p>Residential units and ancillary areas within the blocks of flats are required to be provided with a Category 2 sprinkler system conforming to BS 9251.</p> <p>Block H is <11.0m; sprinkler protection is not required within this block.</p> <p>The commercial units are required to be provided with a sprinkler system conforming to BS EN 12845.</p> <p>The basement car park and any commercial units are required to be provided with a sprinkler system conforming to BS EN 12845. The hazard classification for sprinklers in the car park shall be OH2, and for the commercial areas shall be OH3.</p>	3.2
Smoke ventilation systems – Stairs	The stairs within all the blocks of flats shall be provided with a 1.0m ² AOV.	3.3.1
Smoke ventilation – common corridor / protected lobbies	<p>Natural smoke ventilation to be provided by the following:</p> <p>A 1.5m²AOV located on the external wall; or</p> <p>A 1.5m² natural smoke shaft; or</p> <p>A mechanical smoke ventilation system (This is required in Block A where the travel distance from the apartment door furthest away from the stair, along the common corridor to the door of the stair is > 15.0m).</p> <p>A mechanical smoke ventilation system will be installed in Block f4 to support the residential lobby design at ground floor level.</p>	3.3
Smoke and Heat Ventilation from Basement Car Park	<p>A smoke and heat ventilation system should be provided from the basement car park storey, the system should be designed in accordance with BS 7346-7</p> <p>Single stair buildings should not connect to basement car parks. To justify this arrangement, a mechanical smoke ventilation system is required in the car park. CFD modelling will be required to show that this mechanical smoke control system prevents smoke from entering the stair.</p>	<p>3.3.12</p> <p>3.3.16</p>

Item	Details	Report Ref
Emergency lighting	Provided through common evacuation routes and essential ancillary areas.	3.5
Emergency (life-safety) power supply	All life-safety systems will be provided with a secondary power supply.	3.6
Dry Rising Main	<p>Dry riser outlet mains are required to be provided on the full landing of the stairs at all levels in all blocks (including basement).</p> <p>FRS vehicle access shall be provided to within 18m and within clear sight of the dry riser inlets to facilitate personnel access and connectivity with firefighting equipment of each dry riser inlet</p>	7.1.1

CONTENTS

1. INTRODUCTION	6	6. EXTERNAL FIRE SPREAD	24
1.1 General	6	6.1 External wall construction – Buildings over 18m	24
1.2 Fire safety guidance	6	6.2 External wall construction – blocks with a height less than 18m	24
1.3 Alternative fire engineering solutions	6	6.3 Roof coverings	24
1.4 The London Plan (draft) – Policy D12	6	6.4 Space separation and unprotected areas of the façade	25
1.5 Reference information	7	7. ACCESS AND FACILITIES FOR THE FIRE AND RESCUE SERVICE	26
2. PROJECT DESCRIPTION	8	7.1 Vehicle access to and around the site	26
2.2 Risk profile	10	7.2 Access into and through the building	27
2.3 Risk profile – Occupancy Characteristics and Fire Growth Rate	10	7.3 Firefighting facilities	27
2.1 Design occupancy	10	7.4 Firefighting facilities	27
3. ACTIVE FIRE SAFETY SYSTEMS	11	7.5 Water supplies	27
3.1 Means of detection and alarm	11	7.6 First-aid firefighting	27
3.2 Automatic suppression system	11	APPENDIX A – DRAWING REGISTER	28
3.3 Smoke ventilation system	11		
3.4 Electromagnetic locking / hold-open devices	15		
3.5 Emergency lighting	15		
3.6 Evacuation for People with Reduced Mobility and Evacuation lifts	15		
3.7 Emergency (life-safety) power supplies	15		
4. MEANS OF WARNING AND ESCAPE	16		
4.1 Evacuation philosophy	16		
4.2 Horizontal means of escape – Internal flat design	16		
4.3 Horizontal means of escape – Residential Areas	17		
4.4 Single Stair Connecting to basement car park	19		
4.5 Horizontal means of escape – Duplex	19		
4.6 Horizontal means of escape – Commercial Units	19		
4.7 Means of Escape – Basement Car Park	20		
4.8 Means of Escape from Ancillary Accommodation	21		
4.9 Vertical means of escape	21		
4.10 Private balconies and communal terraces	21		
4.11 Escape beyond final exits	21		
5. PASSIVE FIRE PROTECTION	22		
5.1 Internal wall and ceiling linings	22		
5.2 Structural Fire Resistance	22		
5.3 Compartmentation and fire-resisting construction	22		
5.4 Fire doors	23		
5.5 Fire-stopping and penetrations through fire-resisting construction	23		
5.6 Cavity barriers and concealed spaces	23		

1. INTRODUCTION

1.1 General

- 1.1.1 Ashton Fire have been commissioned by Fairview Estates Ltd to provide fire safety consultancy services for the proposed Victoria Quarter residential development located in New Barnet, North London.
- 1.1.2 This document is confidential and for the exclusive benefit of Fairview Estates Ltd (the Client). It may not be assigned to or relied upon by a third party without agreement of Ashton Fire Ltd (Ashton Fire) in writing. Ashton Fire retains all copyright and other intellectual property in the document and its contents unless transferred by written agreement between Ashton Fire and the Client.
- 1.1.3 This report outlines the minimum fire safety provisions required for the proposed Victoria Quarter development to be compliant with the Functional Requirements of the Building Regulations 2010 (as amended).
- 1.1.4 This document is an outline document only and is not to be submitted as part of the Building Regulation application; a Detailed Fire Safety Strategy is required to be developed during the proceeding design stages to support.

1.2 Fire safety guidance

- 1.2.1 The principal guidance document being used to demonstrate compliance with the requirements of the Building Regulations shall be BS 9991 [1]. For areas that fall outside the scope of BS 9991, the recommendations contained within BS 9999 shall be followed. It is noted that this guidance document does not set out statutory requirements; they are intended to provide guidance only for generic building designs. An alternative solution can be applied to achieve an acceptable level of safety commensurate with the function requirements of the Building Regulations 2010 (as amended).
- 1.2.2 On the basis that recommendations made within the guidance documents are followed, it is considered that the Requirements of the Building Regulations 2010 (as amended) will be fulfilled; and that an adequate level of fire safety will be provided throughout the premises.

1.3 Alternative fire engineering solutions

- 1.3.1 Fire engineering principles are employed to support alternative solutions where strict adherence to the codes would conflict with the wider aspirations for the scheme. The use of a fire safety engineering approach is recognised within BS 9991 as an acceptable means of complying with the Functional Requirements.
- 1.3.2 Apart from where noted in this report, the design will be in accordance with the recommendations of BS 9991. Departures from the code guidance are identified and alternative solutions proposed following the methodology outlined in PD 7974 [2].
- 1.3.3 In accordance with the fire safety engineering principles detailed in the PD 7974 codes of practice, all fire precautions are determined based on there being one seat of fire, as considered suitable for accidental fires.

1.4 The London Plan (draft) – Policy D12

- 1.4.1 The draft Policy D12 states:

In the interest of fire safety and to ensure the safety of all building users, all developments proposals must achieve the highest standards of fire safety and ensure that they:

- Identify suitably positioned unobstructed outside space:
 - For fire appliances to be positioned on;
 - Appropriate for use as an evacuation assembly point;
- Are designed to incorporate appropriate features which reduce the risk to life and the risk of serious injury in the event of a fire; including appropriate fire alarm systems and passive and active fire safety measures;
- Are constructed in an appropriate way to minimise the risk of fire spread;
- Provide suitable and convenient means of escape, and associated evacuation strategy for all building users;
- Develop a robust strategy for evacuation which can be periodically updated and published, and which all building users can have confidence in;
- Provide suitable access and equipment for firefighting which is appropriate for the size and use of the development.

All major development proposals should be submitted with a Fire Statement, which is an independent fire strategy, produced by a third party, suitably qualified assessor. The statement should detail how the development proposal will function in terms of:

- The building's construction: methods, products and materials used, including manufacturers' details;
- The means of escape for all building users: suitably designed stair cores, escape for building users who are disabled or require level access, and associated evacuation strategy approach;
- Features which reduce the risk to life: fire alarm systems, passive and active fire safety measures and associated management and maintenance plans;
- Access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and position of equipment, firefighting lifts, stair and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these;
- How provision will be made with the curtilage of the site to enable fire appliances to gain access to the building;
- Ensuring that any potential future modification to the building will take into account and not compromise the base build fire safety/ protection measures.

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

- 1.4.3 In accordance with Policy D5 (Inclusive Design) of the London Plan, safe and dignified emergency evacuation is required to be incorporated into the building for all building users. As this building has a passenger lift installed, the aforementioned policy stipulates that a suitably sized lift should be provided for evacuation. Fire evacuation lifts and associated provisions should be appropriately designed and constructed and should include the necessary controls suitable for the purposes intended. Furthermore, the operation of the lifts should be supported by appropriate management procedures. In accordance with Annex G of BS 9999, the evacuation lifts may be operated using either driver assisted evacuation, automatic evacuation or remote assistance evacuation. The end client shall

need to understand and provide a suitable management plan for the evacuation lifts within the building.

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

Table 1 - Qualifications and relevant experience

Name	Role	Academic qualifications	Membership of professional bodies	Relevant experience
Harry McDaid	Director	BSc in Architectural Technology BSc(Hons) Fire Safety Engineering	Associate Member with the Institute of Fire Engineers (AIFireE) Member with Engineers Ireland (MIEI)	8 years in the design of fire strategies for residential buildings including high-rise buildings. 3 years as an active firefighter with Donegal Auxiliary Fire Service.
Felipe Herrera	Associate Director	BSc in Architectural Engineering MSc in Architectural Engineering	Chartered Engineer with Engineering Council UK Member of the Institution of Fire Engineers Member of the Society of Fire Protection Engineers	10 years in the design of fire strategies for residential buildings including high-rise buildings.
Ceranda Argue	Senior Engineer	BSc in Architectural Technology BSc(Hons) Fire Safety Engineering	Member with Engineers Ireland (MIEI)	8 years in fire safety engineering and high-rise buildings.

- 1.4.5 As this document is a performance-based strategic document which is used to inform other members of the design team. As such, when reviewing the draft Policy D12 requirements, this document should be read in line with other supporting documentation produced by other members of the design team.

1.5 Reference information

- 1.5.1 This outline fire strategy is based on information provided by the design team to Ashton Fire as listed in Table 15. Additional contradictory information or subsequent design variations to the information supplied may render the findings and recommendations of this report invalid.

2. PROJECT DESCRIPTION

- 2.1.1 The proposed Victoria Quarter development is located on land formerly known as British Gas Works, Albert Road, New Barnet, Barnet, EN4 9SH. The project consists of the redevelopment of the site to provide 544 residential units (Use Class C3) within 13 buildings ranging from 4 to 8 storeys, with 267.1sqm of retail/commercial space and 112.7sqm of community space (Use Class A1/A2/A3/A4/B1/D1/D2) at ground floor, new public realm with communal landscaped amenity areas, alterations and additions to existing highways arrangements plus the removal of existing elevated footbridge and creation of new pedestrian routes, 334 car parking spaces (including car club and accessible provision) with basement and surface level provision, secure cycle parking, servicing and other associated development. This Outline Fire Strategy is applicable to the residential accommodation and basement car park only.
- 2.1.2 Residential Block H is unique to the development as this block consists of a four storey residential block plus three two storey duplex houses. The duplex houses and the residential block are separated at ground level by a cycle store. This block is also the only one in the development that is less than 11.0m high and is not provided with a sprinkler system.
- 2.1.3 A commercial unit with a double height space will be provided at ground level in Block J1. Residential accommodation will be provided above at levels 2-4. This fire strategy is for the Shell and Core of the retail unit only. A separate fit-out Fire Strategy shall be required pre-occupation of these units.
- 2.1.4 Table 2 below provides a summary of each residential block at the Victoria Quarter development.

Table 2 – Summary of accommodation in Residential Blocks

Block	Number of storeys	Height (m) (Measured to FFL of top most occupied floor)	Further Information / Ancillary Accommodation
Block A	8 (G+7)	22.05 m	Community Space, Cycle Store, Refuse Store located at ground level. Residential units provided at all levels
Block B1	7 (G+6)	18.9m	No ancillary accommodation provided in this block. Single stair connects to the basement car park.
Block B2	6(G+5)	15.75m	No ancillary accommodation provided in this block. Plot 105 and Plot 104 are duplex units. Single stair connects to the basement car park
Block C1	7 (G+6)	18.9 m	Refuse Store at ground level. Residential units provided at all levels. Single stair connects to the basement car park
Block C2	7(G+6)	18.9m	No ancillary accommodation provided in this block. Plot 193 and Plot 192 are duplex units. Single stair connects to the basement car park

Block	Number of storeys	Height (m) (Measured to FFL of top most occupied floor)	Further Information / Ancillary Accommodation
Block D1	7(G+6)	18.9m	No ancillary accommodation provided in this block. Residential units provided at all levels. Single stair connects to the basement car park
Block D2	7(G+6)	18.9m	No ancillary accommodation provided in this block. Residential units provided at all levels. Single stair connects to the basement car park
Block E	7 (G+6)	18.9m	Refuse Store and Cycle Store located at ground level. Residential units provided at all levels
Block F4	7(G+6)	18.9m	Refuse Store and Cycle Store located at ground level. Residential units provided at all levels
Block F3	6(G+5)	15.75m	Refuse Store at ground level. Residential units provided at all levels
Block F2	6(G+5)	15.75m	Refuse Store and Cycle Store located at ground level. Residential units provided at all levels
Block F1	5(G+4)	12.6m	Refuse Store and Cycle Store located at ground level. Residential units provided at all levels
Block G	5(G+4)	12.6m	Energy centre, refuse store and cycle store at Ground Floor level. Residential Units provided at all levels
Block J1	5(G+4)	12.6m	Commercial Unit at Ground (Double height space) Cycle Store and Refuse Store at Ground level. Residential Units provided from level 2 - 4.
Block J2	5(G+4)	12.6m	Double Substation located at ground level. Cycle Store at ground level . Residential units provided at all levels.
Block H	4(G+3)	10.45m	Refuse and Cycle Stores located at ground level. Block also consists of three, two storey duplex houses,
Note: The height of each block has been estimated and is based on a floor level of 3.15m between each level. The actual level of the blocks will be determined as the design proceeds.			

An indicative site plan identifying the location of the residential blocks is shown in Figure 1.

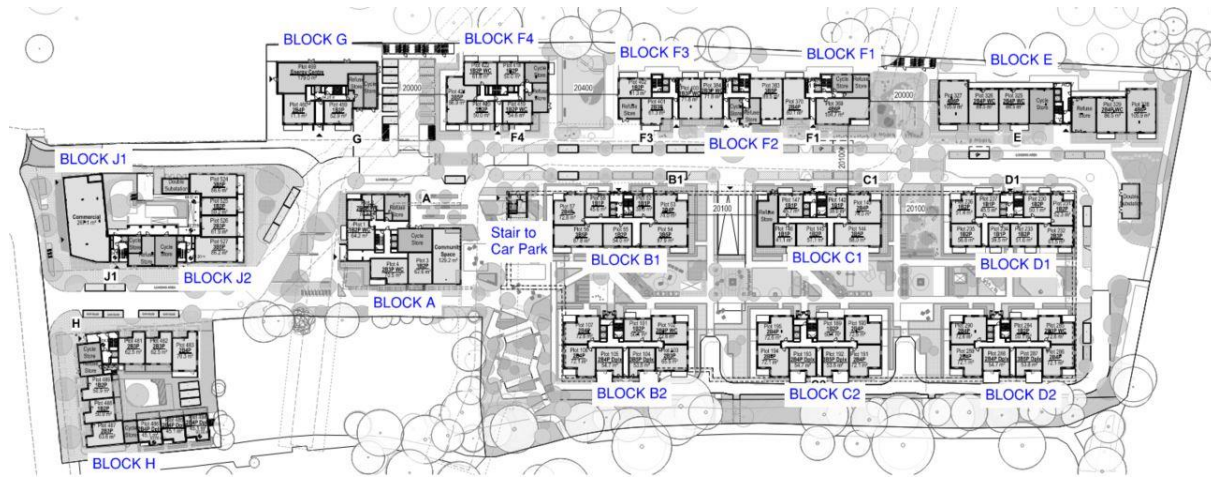


Figure 1 - Indicative site plan

2.1.5 Figure 2 below is an indicative layout of the basement carpark, the connections between the residential blocks above are clearly identified.



Figure 2 Basement Carpark

2.1.6 Figure 3 to Figure 6 are indicative layouts of residential units in Block C2 and Block E at ground and fifth floor levels. Block C2 illustrates the typical layout of the buildings in the development where a naturally ventilated communal corridor should be provided. Block E illustrates typical layouts of buildings in the development where the flats are approached via an external balcony.

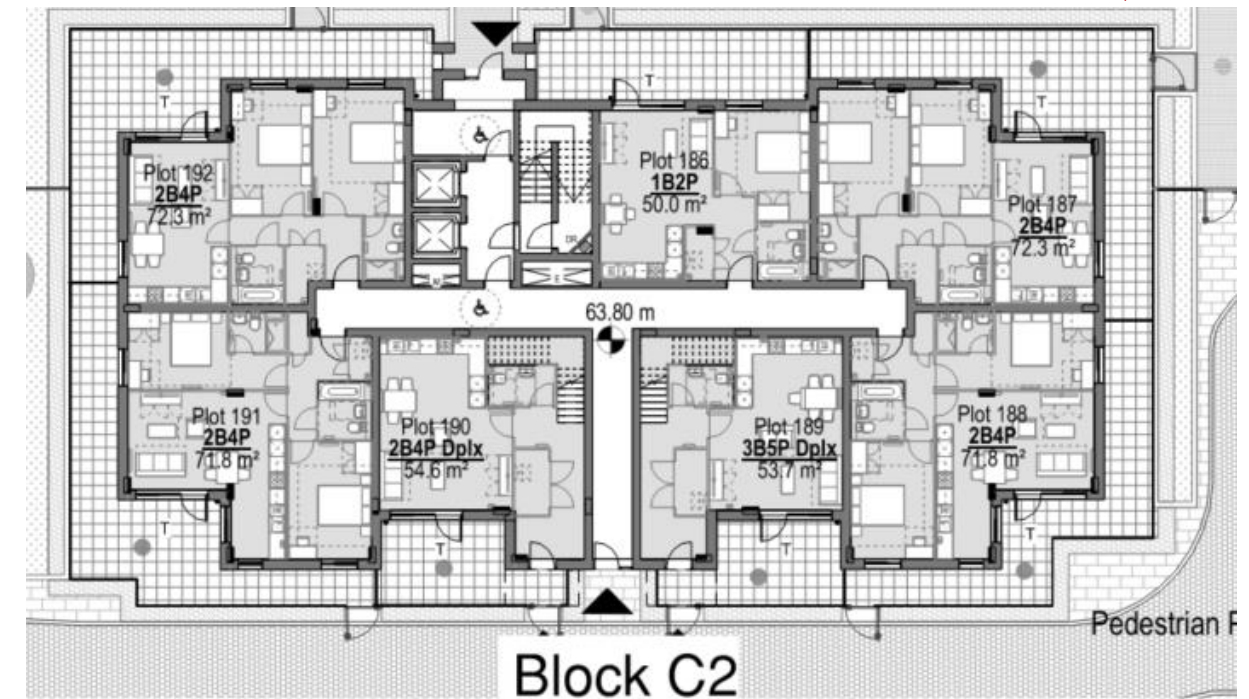


Figure 3 Typical Flat layout at ground level for Victoria Quarter - Block C2



Figure 4 Typical Flat layout at upper level for Victoria Quarter - Block C2 - L5 (Ventilated Corridor)



Figure 5 Typical Flat layout at ground level for Victoria Quarter – Block E (Balcony Approach)



Figure 6 Typical Flat layout at upper level for Victoria Quarter – Block E - L5 (Balcony Approach)

2.2 Risk profile

- 2.2.1 The commercial unit located at ground level in Block J shall be designed in accordance with the guidance contained in BS 9999:2017 [3].
- 2.2.2 As per the guidance contained in BS 9999, a risk profile is established to determine appropriate means of escape and other relevant fire safety provisions for life safety. The risk profile is a function of the occupancy characteristic and the fire growth rate.

2.3 Risk profile – Occupancy Characteristics and Fire Growth Rate

- 2.3.1 The commercial unit shall be accessible to members of the public, the appropriate occupancy characteristic is considered to be 'B – Awake and Unfamiliar'.
- 2.3.2 The use of the commercial unit is not defined but to allow for future flexibility, a more onerous fire growth rate will be applied, i.e. '3 – Fast', allowing for such uses as shops, bars and restaurants to occupy the space.
- 2.3.3 Table 3 below details the risk profile for the commercial unit.

Table 3 - Risk profile summary

Space	Occupancy characteristics	Fire growth rate	Risk profile
Commercial	B	3	B3

2.1 Design occupancy

- 2.1.1 The estimated number of occupants expected within the Commercial Unit is to be calculated in order to ensure that the number and the width of exits have sufficient capacity for means of escape purposes.
- 2.1.2 The maximum estimated occupancies noted in Table 4 have been calculated based on the floor space factors provided within Table 9 of BS 9999, and supplemented by Table D1 of Approved Document B (ADB) Vol 2 [4].
- 2.1.3 The figures in Table 4 have been used to give an example of likely occupant numbers during the fit-out, but these shall need to be confirmed at the fit-out stage.

Table 4 - Design occupancy

Space	Level	Area	Floor space factor	Maximum design occupancy
Commercial	Ground Floor	268 m²	2 m²/person	134

- 2.1.4 Figure 7 illustrates the indicative layout of the commercial unit in Block J at Ground level.

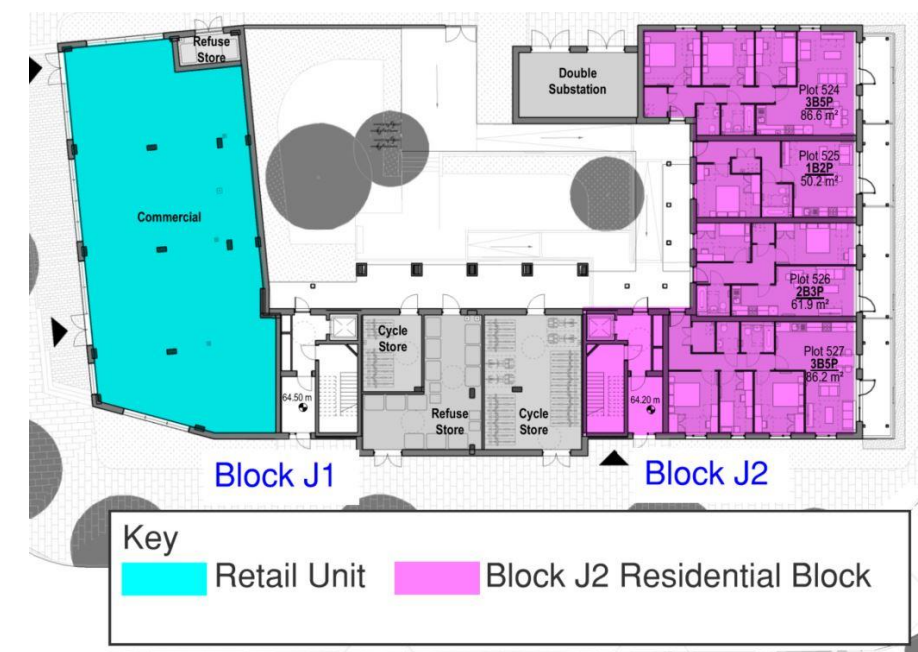


Figure 7 -Block J1 Commercial Unit and Block J2 Residential Accommodation – Ground Level

3. ACTIVE FIRE SAFETY SYSTEMS

3.1 Means of detection and alarm

3.1.1 The fire detection and alarm system requirements across the development are summarized in Table 5.

Table 5 -Minimum fire detection and alarm system

Accommodation	Minimum requirements
Residential Flats	All flats shall be provided with a minimum of a Grade D, Category LD1 detection and alarm system, designed and installed in accordance with BS 5839-6 [5]. A Grade D1 system should be provided for rented units, while owner-occupied units should be provided with a Grade D2 system. Where access from the balcony area is via a cooking space sounders are required to be provided on the balcony.
Residential communal corridors	L5 system conform to BS 5839-1 [5]. The purpose of this system is to activate the smoke ventilation systems within the communal corridors only, i.e. it will not provide an audible alarm within the building. It is recommended that the detector head spacing for the L5 system within the corridors is in accordance with the recommendations for a category L4 system.
Ancillary Accommodation	An L2 system conforming to BS 5839-1 shall be provided to all ancillary accommodation within the residential building.
Duplex Houses	Block H – Each Duplex house should be provided with a Grade D, Category LD2 detection and alarm system, designed and installed in accordance with BS 5839-6. A Grade D1 system should be provided for rented units, while owner-occupied units should be provided with a Grade D2 system.
Commercial Units	In accordance with Table 7 of BS 9999, areas with a B3 risk profile (Commercial Unit) are required to have a minimum of L2 detection and alarm system designed and installed in accordance with BS 5839-1. This shall be installed to provide coverage to the Shell and Core Unit, at fitout stage the level of system installed should be upgraded to a level that is appropriate for the use of the unit
Basement Car Park	An L3 system in accordance with BS 5839-1 should be provided in the basement car park.

3.2 Automatic suppression system

- 3.2.1 With the exception of Block H, all residential blocks are more than 11.0m in height; as such, a Category 2 sprinkler system conforming to BS9251 should be provided throughout all of the residential units.
- 3.2.2 The commercial unit shall have a separate independent sprinkler system, the system should be an OH3 system designed and installed in accordance with BS EN 12845.
- 3.2.3 The basement car park should be provided with a sprinkler system, the system should be an OH2 system designed and installed in accordance with BS EN 12845.
- 3.2.4 The ancillary areas (refuse areas, plant areas etc) should be provided with a sprinkler system designed and installed in accordance with BS EN 12845. However it may also be possible to extend the residential system into these areas, subject to a risk assessment carried out by the specialist designer.

3.2.5 All sprinkler systems shall be designed by a sprinkler specialist designer.

3.2.6 Based on the height of the building, sprinkler protection is not required to be provided to Block H.

3.3 Smoke ventilation system

Escape Stairs

- 3.3.1 All the escape stairs are required to be provided with an AOV that is sited at a high a level as is practicable on the top storey the stairway or at the head of the stairway. The AOV is required to have a geometric free area of at least 1.0m².
- 3.3.2 The total unobstructed cross-sectional area (geometric free area), measured in the plane where the area is at a minimum and at right angles to the direction of air flow as illustrated in Figure 8.

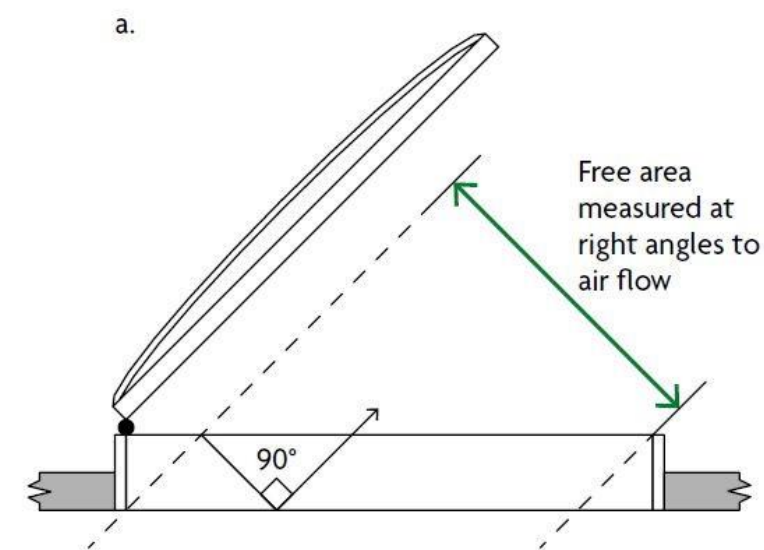


Figure 8 Free area of smoke ventilators (From ADB Vol 1: 2019 – Diagram D7)

Residential Blocks of Flats

- 3.3.3 Smoke ventilation requirements for each block of flats is detailed in Table 6 and as illustrated in Figure 10 to Figure 16

Table 6 - Smoke Ventilation Requirements

Block	Travel Distance (Common areas)	Sprinkler (Y/N)	Mechanical / Natural Ventilation	Comments
Block A	20.6m	Y	Mechanical	Travel distance >15.0m Mechanical Smoke Ventilation System is required to justify the travel distances. 1.0m ² AOV to be provided at the head of the stair.
Block B1	12.9m	Y	Natural	Smoke ventilation to be provided in communal corridor – at all levels above ground. 1.5m ² Smoke shaft or 1.5m ² AOV should be provided. Communal corridor in front of protected lobby at ground level to be naturally ventilated by 1.5m ² AOV or 1.5m ² smoke shaft. 1.0m ² AOV to be provided at the head of the stair.
Block B2	14.4	Y		
Block C1	12.7m	Y		
Block C2	15.0	Y		
Block D1	12.6	Y		
Block D2	14.7	Y		
Block E	N/A	Y	N/A	Flats approached from external balcony at all levels above ground. 1.0m ² AOV to be provided at the head of the stair only.
Block F4	6.9m	Y	Mechanical	A mechanical smoke ventilation system shall be installed to support the residential lobby design at ground floor level. At ground level the lobbies in front of the stair shall be mechanically ventilated, on the upper floor levels the lobby in front to the stair shall be ventilated with a MSVS. The design of the system is to be verified by CFD analysis. The design approach is subject to approval by AHJ.
Block F3	6.3	Y	Natural	Smoke ventilation to be provided in communal corridor – at all levels above ground. 1.5m ² Smoke shaft or 1.5m ² AOV should be provided. Communal corridors in front of protected lobby at ground level to be naturally ventilated by 1.5m ² AOV or 1.5m ² smoke shaft.
Block F2	5.9	Y		
Block F1	6.0	Y		
Block G	7.0	Y	Natural	Smoke ventilation to be provided to lobby in front of the stair – at all levels above ground via 1.5m ² Smoke shaft. Lobby serving ancillary accommodation to be provide with 0.4m ² permanently open vent, ducted direct to outside.
Block J1	N/A	Y	N/A	Flats approached from external balcony at all levels above ground. 1.0m ² AOV to be provided at the head of the stair only.
Block J2	N/A	Y		
Block H	N/A	N		

Natural Smoke Shaft

3.3.4 Where the communal corridor/lobby shall be ventilated via a natural smoke shaft, the smoke shaft should adhere to the following provisions:

- Have a minimum cross-sectional area of 1.5m² (minimum dimension 0.85m in any direction);
- Open at roof level, minimum 0.5m above any surrounding structures within 2m of it horizontally;
- Extend a minimum of 2.5m above the ceiling of the highest storey served by the shaft;
- The smoke shaft shall be open to external air at the top and closed at the base;
- The free area of all the following vents should be a minimum of 1.0m² in the following places:
 - From the corridor or lobby into the shaft;
 - At the opening at the head of the shaft;
 - At all internal locations within the shaft (e.g. safety grilles).
- The top of the lobby or corridor vent should be located as close to the ceiling of the lobby or corridor as is practicable and should be at least as high as the top of the door connecting the lobby or corridor to the stairwell;
- The smoke shaft should be constructed from a class A1 material. All vents should either be a fire door-set with at least the same fire resistance as the shaft or fitted with a fire and smoke damper. The shaft should be vertical from base to head, with a maximum of 4m at a maximum inclined angle of 30 degrees.
- If smoke is detected in the common corridor or lobby, both of the following should occur.
 - Simultaneous opening of vents on the storey where the fire is located, at the top of the smoke shaft and to the stair.
 - Vents from the corridors or lobbies on all other storeys should remain closed, even if smoke is subsequently detected on storeys other than where the fire is located.
- No services other than those relating to the smoke shaft should be contained within the smoke shaft.
- The smoke shaft should be located at the remote end of the corridor away from the staircase.

3.3.5 In accordance with the above, the smoke shaft should extend 2.5m above the ceiling of the highest storey served. However, as an alternative, the AOV opening into the smoke shaft at the highest floor level and the AOV located at the head of the smoke shaft is to have a free area of not less than 1.5m² (an increase from the recommended 1.0m²). The 2.5m clearance at the head of the shaft can then be measured from the ceiling of the floor below the top floor. This is to be discussed and agreed with Building Control. The smoke shaft design detail is illustrated in Figure 9 below:

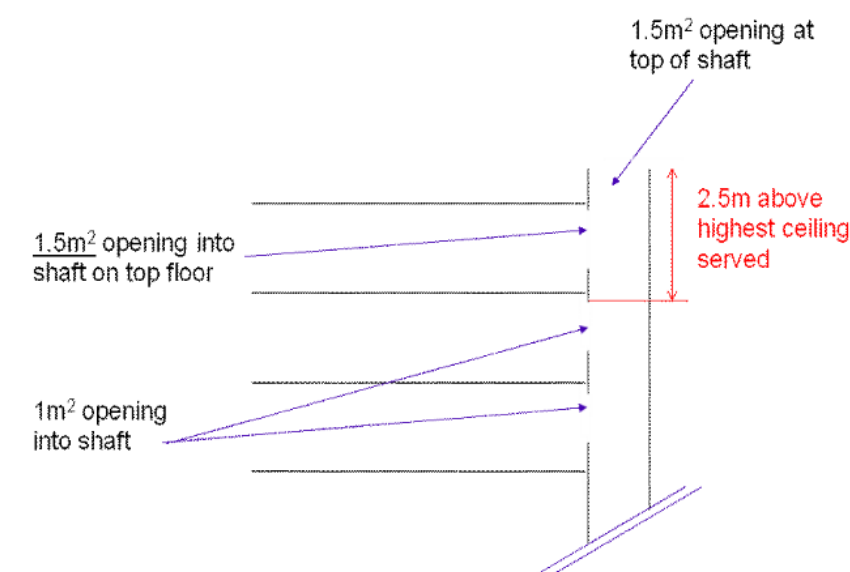


Figure 9-Top of Smoke Shaft Detail

- 3.3.6 This approach reflects the acceptable alternative arrangements as highlighted within the Building Control Alliance (BCA) guidance note 8 - Smoke shaft termination at roof level.
- Mechanical Smoke Shaft**
- 3.3.7 Excessive travel distance over 15m within the communal corridor of Block A will need to be justified via a mechanical smoke ventilation system.
- 3.3.8 In Block F4, a MSVS shall be provided to support the residential lobby design at ground floor layout, the design proposal shall be subject to approval by the AHJ.
- 3.3.9 The MSVS should consists of a mechanical shaft and a form a fresh air inlet. Fresh air could be provided via a natural smoke shaft or an AOV on the external wall in order to prevent the corridor from over pressurising. Typical size of a mechanical smoke shaft is 0.6 – 0.8 m².
- 3.3.10 MSVS system shall need to rapidly clear the corridor of smoke from a fire within a flat. Tenability conditions within the corridor will need to be assessed against the requirements within the Smoke Control Association (SCA) guide. This shall be demonstrated through the use of CFD modelling, which shall be carried out by a third-party specialist and captured in a separate report.
- 3.3.11 Figure 10 to Figure 16 illustrate smoke ventilation requirements with the various residential buildings. Requirements for all buildings are detailed on the compartmentation markups.

Basement Car Park

- 3.3.12 A smoke and heat ventilation system is required to be provided to the basement car park, in accordance with BS 9991; Clause 14.2.1.4 the system should be designed in accordance with BS 7346-7, it should have the capability to clear smoke during a fire and/or after a fire has been suppressed.
- 3.3.13 Protected lobbies between the stairs serving the residential accommodation and the basement car park are required to be provided with 0.4m² permanent ventilation that is ducted direct to outside.
- 3.3.14 Smoke clearance capabilities of the proposed system will be subject to CFD modelling.
- 3.3.15 Notwithstanding the information above, the stair in Block B1, B2, C1, C2 D1 and D2 all connect to the basement. At ground level the stairs are separated by a door to prevent occupants from continuing to discharge to basement level.
- 3.3.16 Single stair buildings should not connect to basement car parks. To justify this arrangement, a mechanical smoke ventilation system is required in the car park. CFD modelling will be required to show that this mechanical smoke control system prevents smoke from entering the stair. In addition, it is recommended that:
- The stairs are separated from the car park by a minimum of 2 lobbies;
 - The lobby closest to the car park should be provided with a smoke ventilation system.
- 3.3.17 This arrangement carries with it an approvals risk and early engagement with Building Control / Fire Service to discuss and agree acceptance criteria is required
- 3.3.18 At basement level the stairs are protected by a double lobby. The lobby will be ventilated by 0.4m² permanently open vent that will be ducted direct to outside.

Ancillary Accommodation

- 3.3.19 Where ancillary accommodation communicates with the communal corridor/ lobby, a protected lobby that is permanently ventilated with a minimum 0.4m² vent, ducted direct to outside should be provided.
- 3.3.20 The following images illustrate the various smoke ventilation requirements across the Victoria Quarter development.

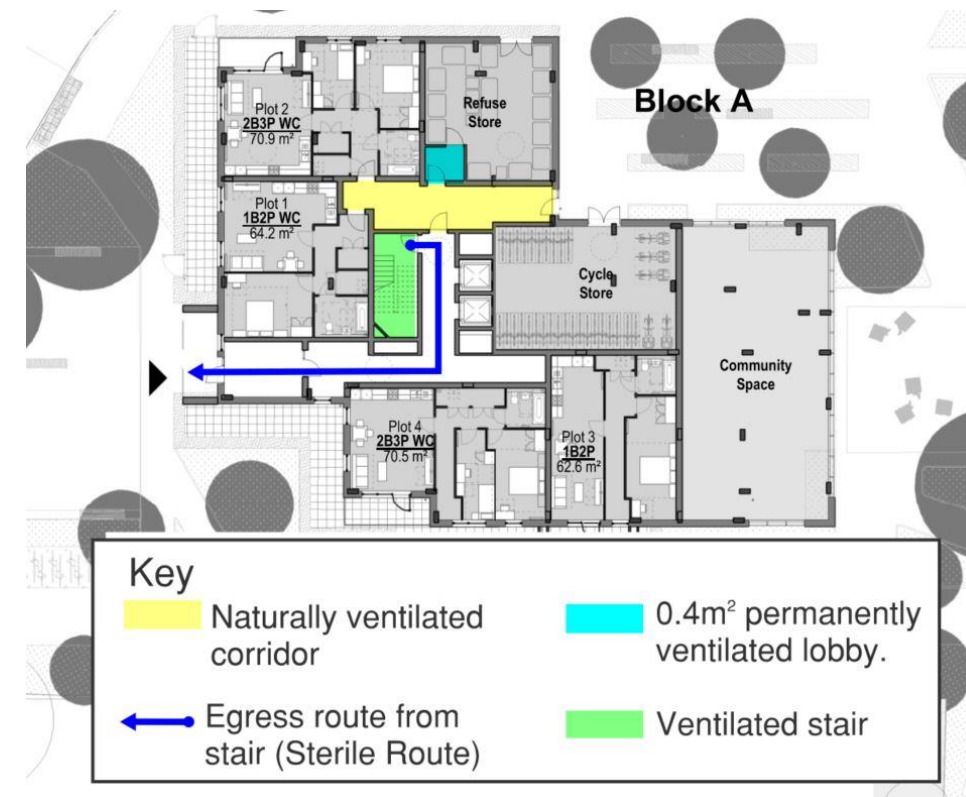


Figure 10 : Block A - Smoke ventilation at Ground Level

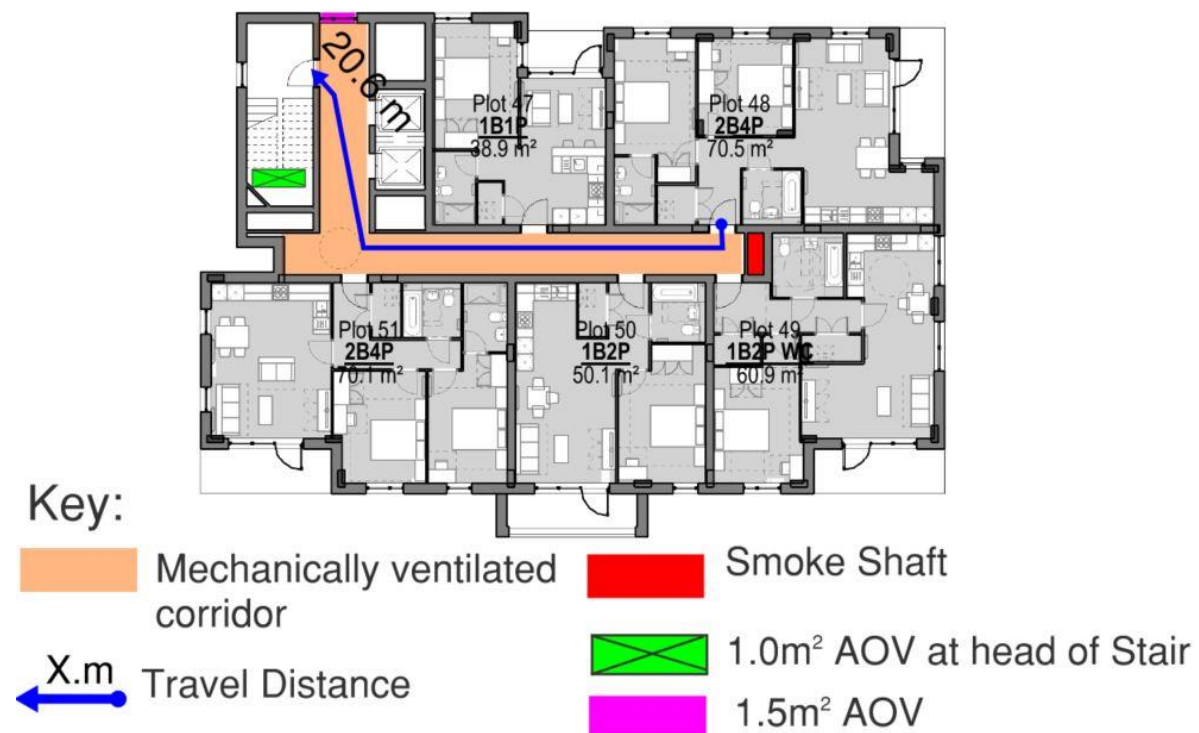


Figure 11 Block A - Mechanical Smoke ventilation requirements (All levels above ground)

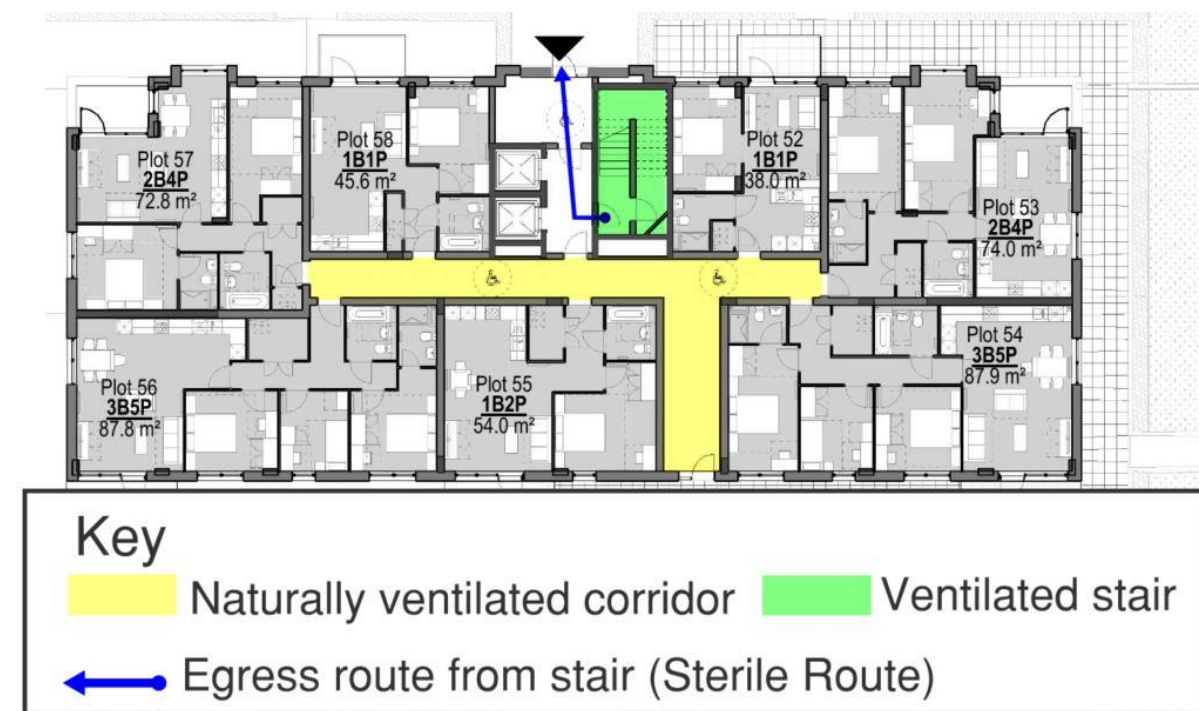


Figure 12 Block B1 - Natural smoke ventilation to communal corridor at ground level - typical layout

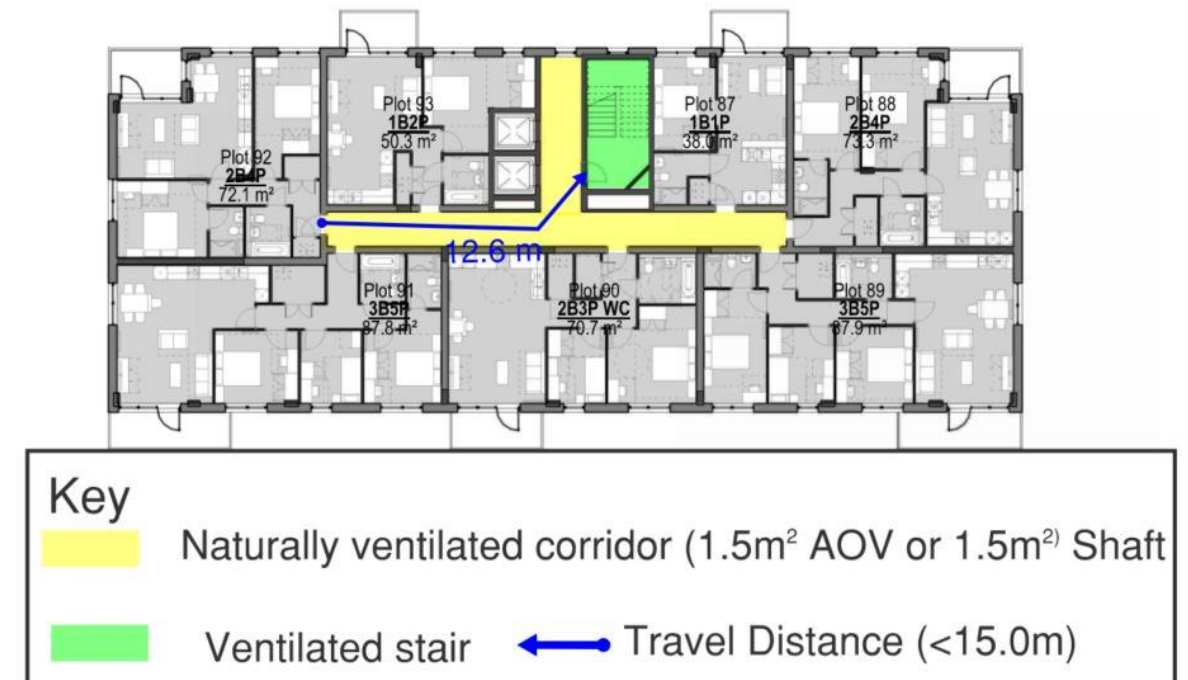


Figure 13 Block B1 - Natural smoke ventilation to communal corridor at level 5 - typical layout

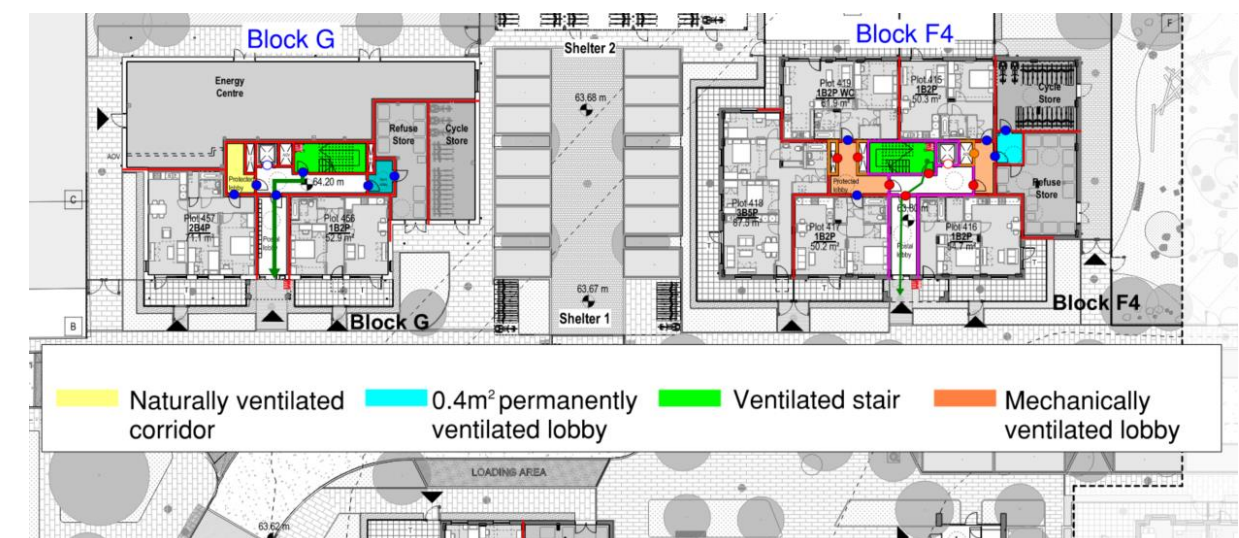


Figure 14 Block G and F4 - Natural smoke and mechanical ventilation to communal corridor ground - typical layout

3.3.21 In Block F4 it is not possible to achieve the required 1.5m² vent between the residential lobby and the stair, to support this design layout a mechanical smoke ventilation system is proposed as follows :

- At ground level a fire rated duct (with damper) shall be provided from the communal residential lobby serving Plot 422, 421 and 420 to the MSVS shaft - the duct shall be at high level and enclosed in fire rated construction.
- The extract rate will need to be confirmed by CFD modelling.
- Lobbies in front of the stair on the upper floors to be mechanically ventilated.
- CFD analysis will be required to confirm that the MSVS will meet the required performance criteria.

- The proposal would need to be agreed with Building Control.

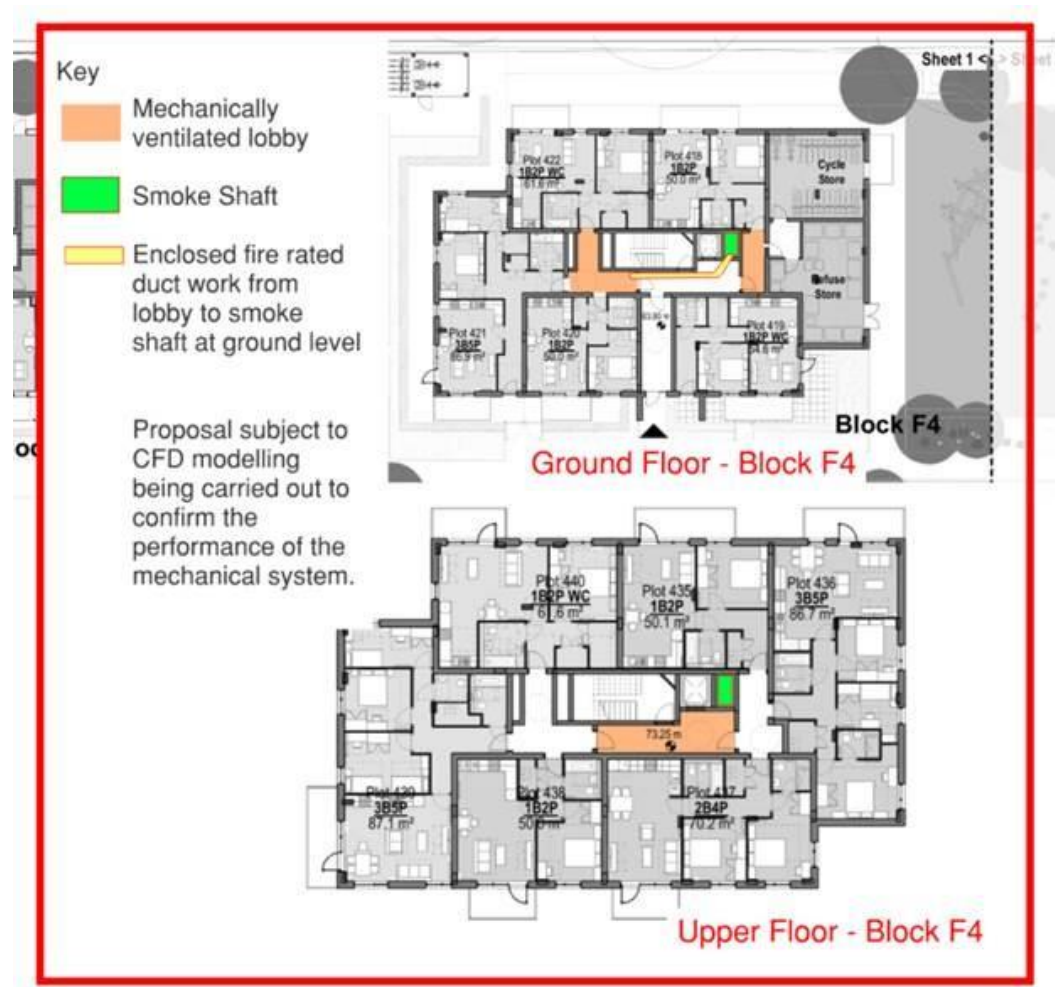


Figure 15 Proposed smoke ventilation solution for Block F4

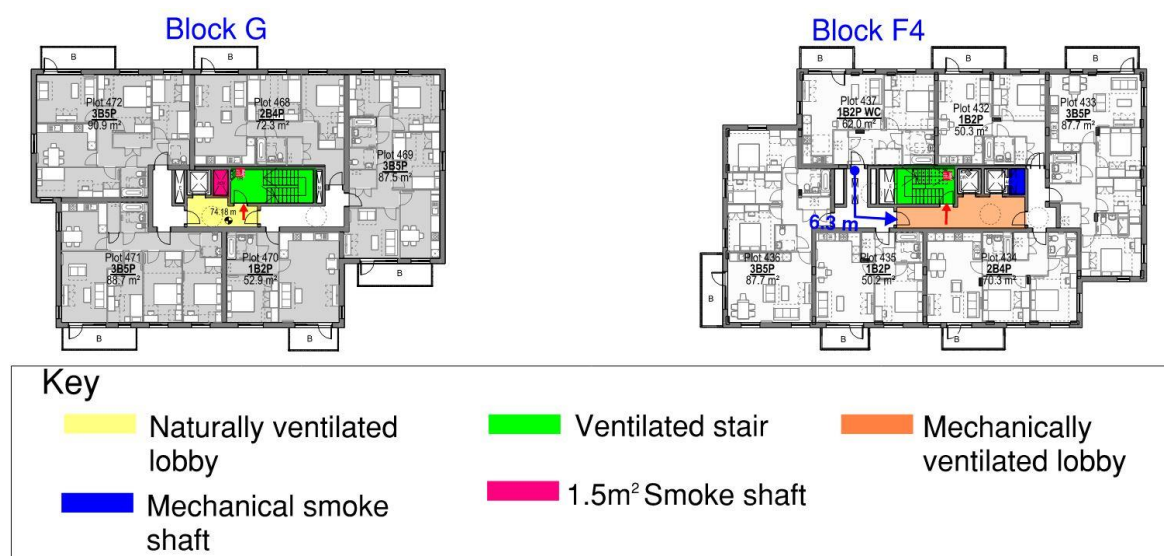


Figure 16 Block G and F4 - Natural and mechanical smoke ventilation to lobby at first floor

3.4 Electromagnetic locking / hold-open devices

3.4.1 Where doors are provided with electromagnetic locking or hold-open devices, these devices are to operate (either release the door to close normally, or release the door to be opened) upon:

- Activation of the detection and alarm system;
- Failure of the power supply;
- Operation of a hand operated witch located to the side of the door;
- Malfunction.

3.5 Emergency lighting

3.5.1 Emergency lighting will be installed in accordance with the recommendations of BS 5266 [6], BS EN 1838 [7] and BS EN 60598-2-22 [8].

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

3.6 Evacuation for People with Reduced Mobility and Evacuation lifts

3.6.1 Following recent updates of London Plan, in accordance with D12 Policy recommendations, consideration should be given on how all building occupants, including those with reduced mobility / wheelchair users can evacuate in an emergency. As it can be difficult for people with reduced mobility (PRM) to navigate the escape stairs, it is typically recommended that occupants are provided with use of suitable lifts in an emergency.

3.6.2 In accordance with the London Plan Policy D5, an evacuation lift should be provided within each core of the building.

3.6.3 Where evacuation lifts are to be provided, the evacuation lift should be a lift routinely used as a passenger lift. The lift should be designed and installed in accordance with relevant provisions of BS EN 81-20 [9] and BS EN 81-70 [10].

3.6.4 The evacuation lift would be required to be provided with a secondary power supply.

3.6.5 The cause and effect of any evacuation lift is to be discussed and agreed. Suitable management procedures will be required to ensure suitable operation of the evacuation lift in the event of an emergency.

3.6.6 The management for the building shall need to ensure that any resident that requires special assistance to evacuate the building has a suitable Personal Emergency Evacuation Plan (PEEP) in place.

3.7 Emergency (life-safety) power supplies

3.7.1 The following fire safety systems shall comply with their respective British Standards regarding secondary power supplies:

- Emergency lighting and signage;
- Automatic fire detection and alarm system;
- Evacuation lift;
- Firefighting lift;
- Automatic smoke ventilation systems.

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

4.3 Horizontal means of escape – Residential Areas

Upper Floors

4.3.1 Provisions for means of escape from the upper floors of the residential blocks are detailed in Table 7.

Table 7 Means of Escape – Upper Floors

Residential Block	Escape from Communal Areas
A, B1, B2, C1, C2, D1, D2, F3, F2 and F1	<p>The flats on the upper floors, flats shall be accessed directly from a protected communal corridor that is linked to a protected stair. The stair shall be provided with a single AOV (achieving a minimum free area of 1m²) at the head of the staircase.</p> <p>The communal corridors shall be provided with either a natural or mechanical smoke ventilation system.</p> <p>Where travel distances are 15.0m or less the corridor may be naturally ventilated via a 1.5m² AOV that is located on the external wall of the corridor or via a 1.5m² smoke shaft that should be located at the most remote end of the corridor.</p> <p>Where the travel distance is more than 15.0m (Block A – all levels above ground) a mechanical smoke ventilation system will be required. The MSVS system shall need to rapidly clear the corridor of smoke from a fire within a flat. Tenability conditions within the corridor will need to be assessed against the requirements within the Smoke Control Association (SCA) guide. This will be demonstrated through the use of CFD modelling carried out by a third-party specialist and is captured in separate reports.</p> <p>Typical layouts are illustrated in Figure 19 and Figure 20.</p>
F4	MSVS to be provided to lobby in front of the stair. A typical layout is illustrated Figure 21. CFD analysis is to be completed to demonstrate the performance of the proposed MSVS.
G	Smoke ventilation to be provided to lobby in front of the stair – at all levels above ground via 1.5m ² Smoke shaft. A typical layout is illustrated Figure 21
E, J1, J2 and H	<p>Flats on the upper levels of these blocks are accessed from a balcony, there is no restriction on the travel distance to the stair. In accordance with BS 9991; Figure 5(b) the façade of the apartment should be constructed to achieve a minimum of 30 minutes fire resistance to height of 1.1m.</p> <p>All doors with glazing that breach the 1.1 m high fire-resisting separation should be self-closing.</p> <p>FD 30 fire doors with appropriate fire-resisting glass. See Figure 22</p>

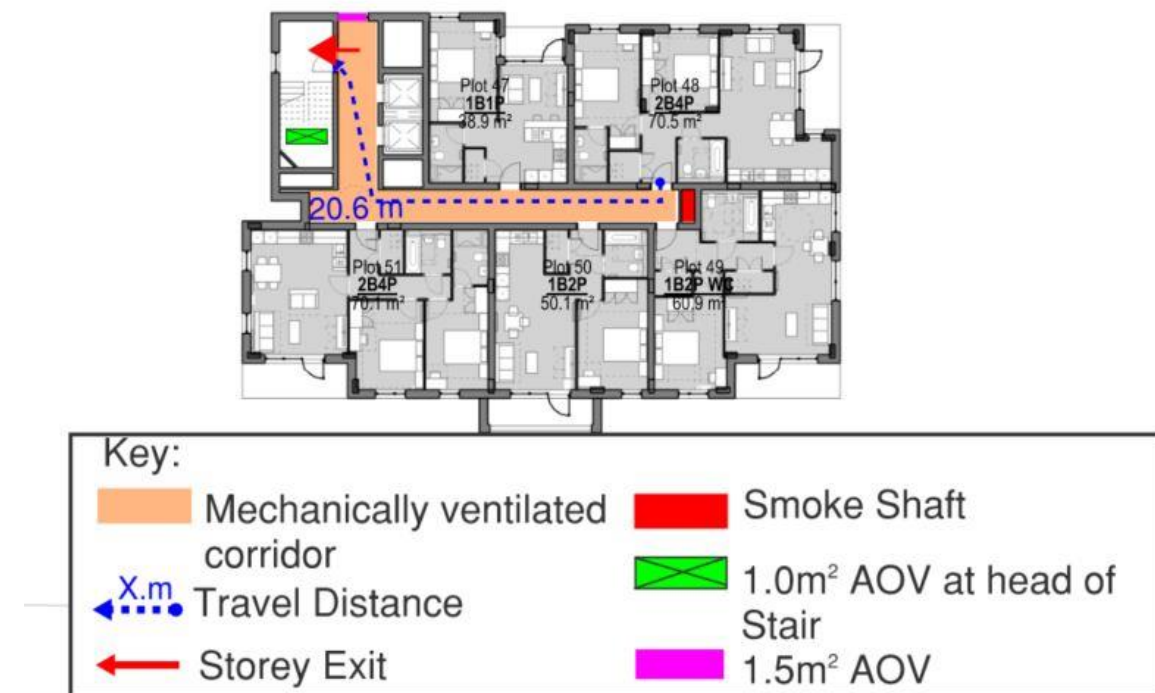


Figure 19 – Means of escape ventilated corridor (MSVS) Block A - upper level

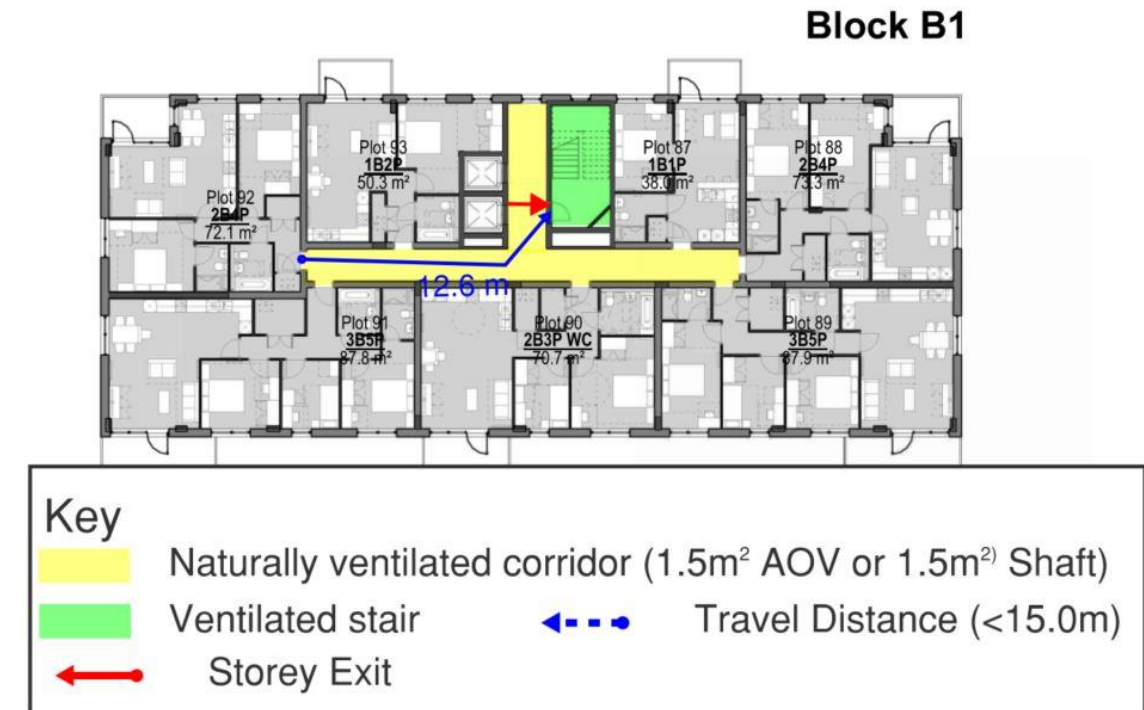


Figure 20 Means of escape typical layout of ventilated corridor (natural) upper level (Block B1)

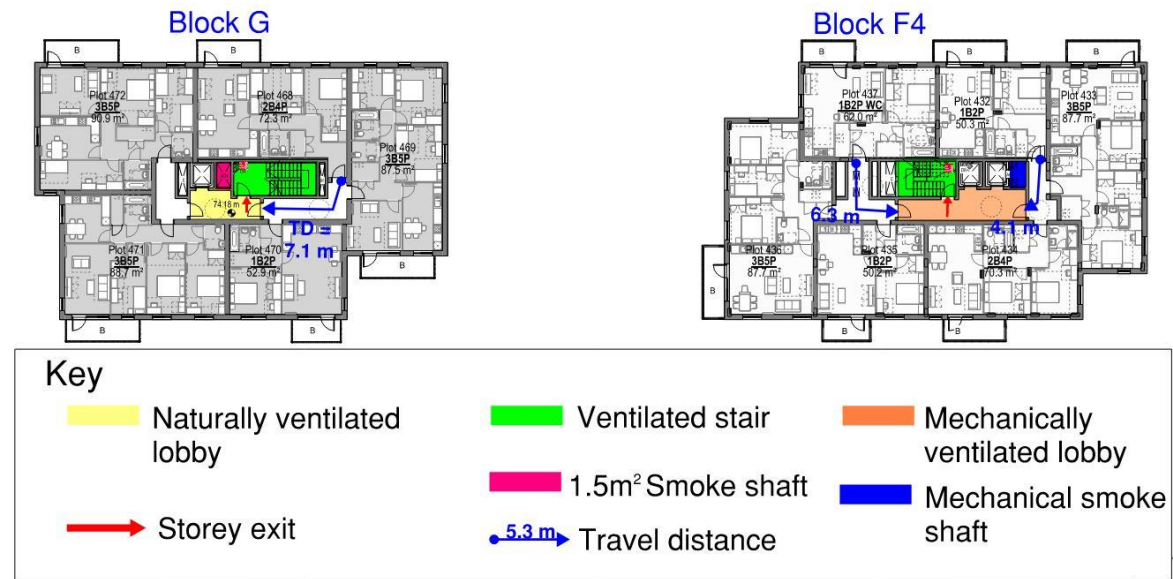


Figure 21 Means of escape typical layout of ventilated lobby upper level (Block G and F4)

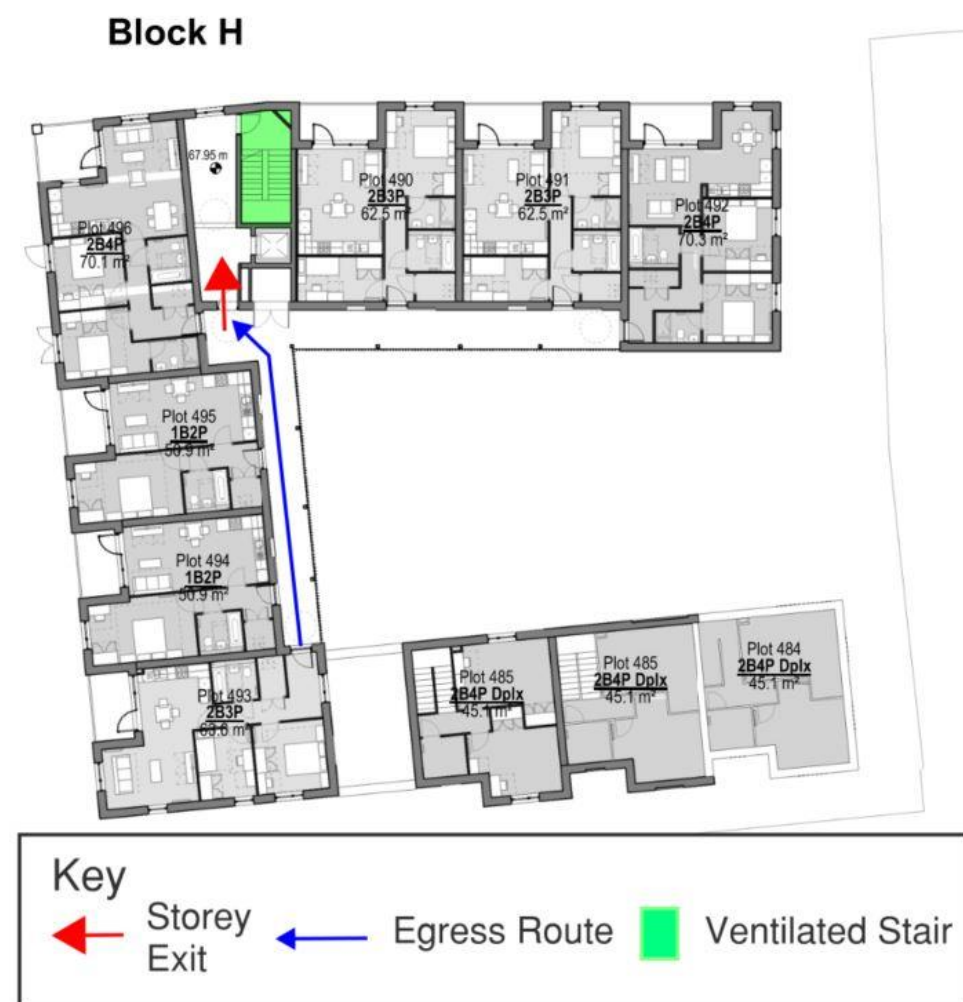


Figure 22 Typical layout means of escape via balcony approach - Upper level Block H

- 4.3.2 At Ground Floor level in all blocks, the stair discharges directly to outside or via a sterile protected exit passageway that discharges direct to outside as illustrated in Figure 23 to Figure 26.
- 4.3.3 The communal corridors in front of the stair are required to be provided with smoke ventilation, this is as illustrated in Figure 23 to Figure 25.

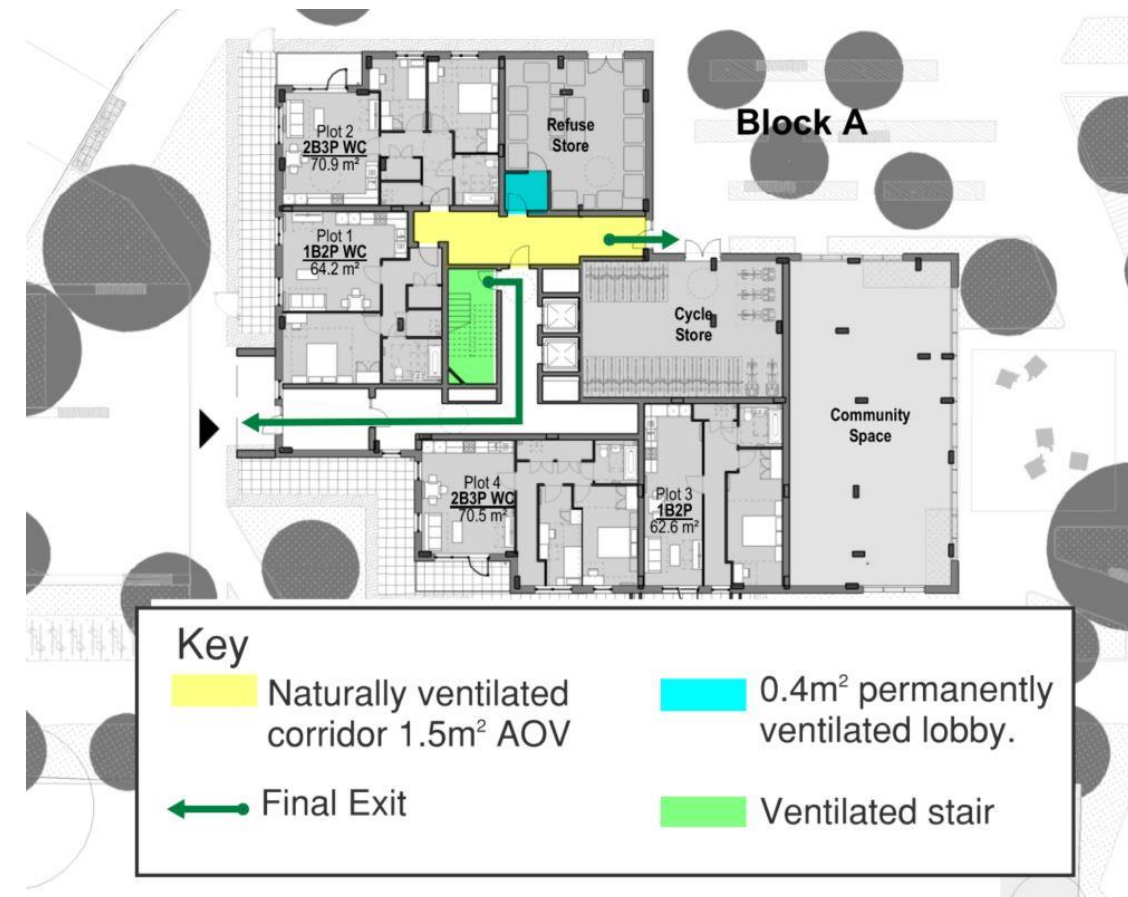


Figure 23 Means of escape from stair direct to outside via protected exit passageway - Block A

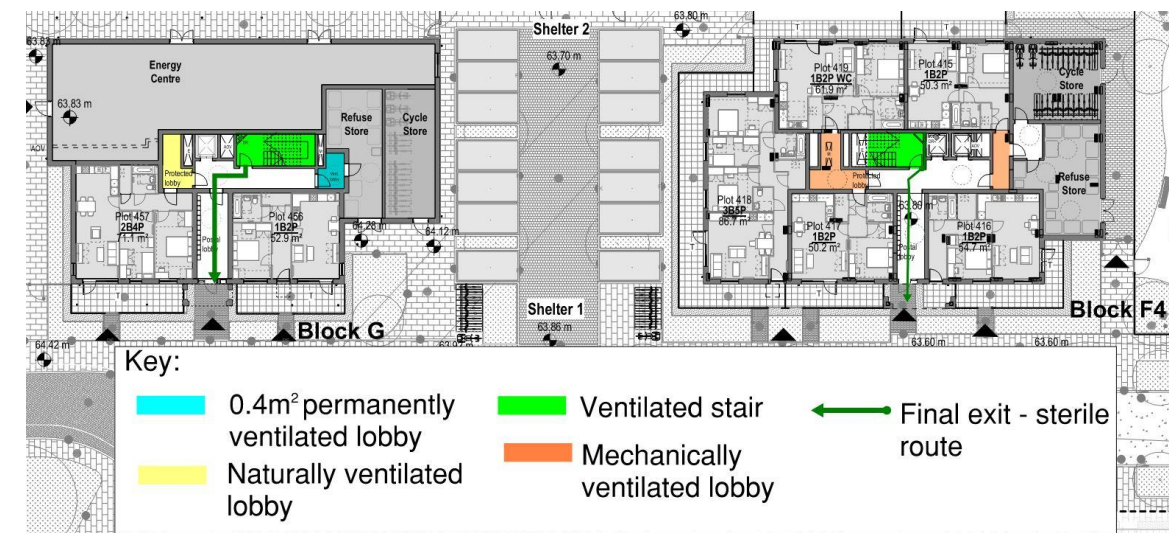


Figure 24 Means of escape direct to outside via protected exit passageway - Block G and F4

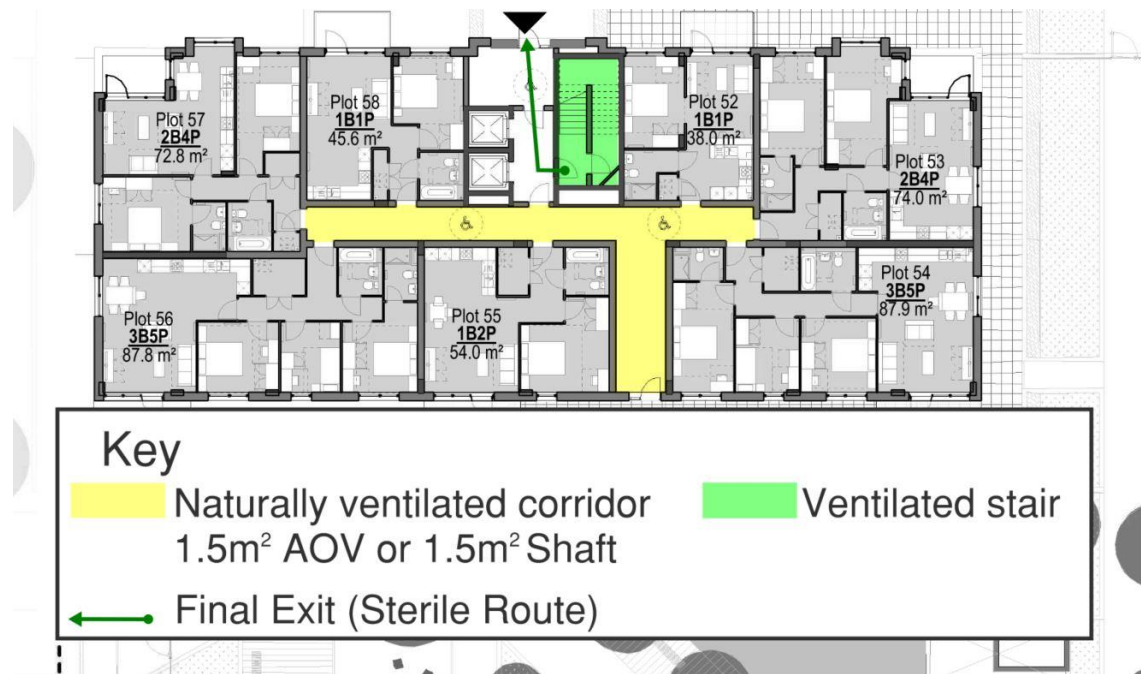


Figure 25 Means of escape direct to outside via protected exit passageway - Block B1

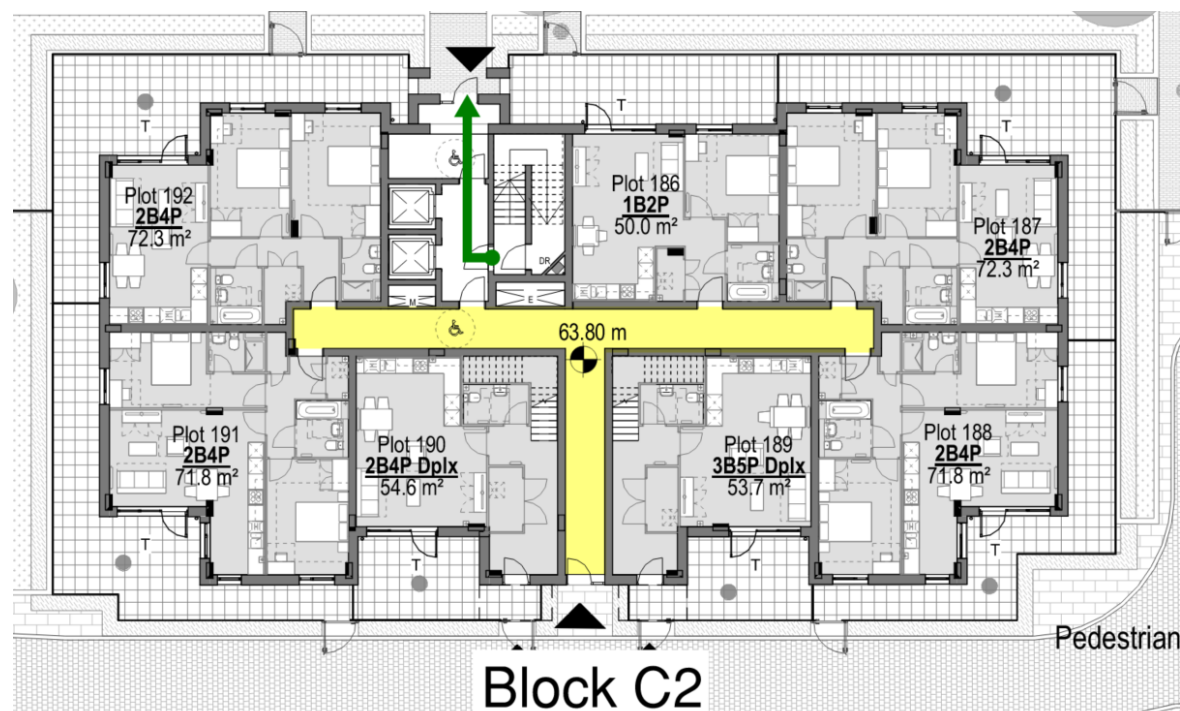


Figure 26 Block C2, D2 and B2 - protected lobby provided

4.4 Single Stair Connecting to basement car park

- 4.4.1 The stair in Block B1, B2, C1, C2 D1 and D2 all connect to the basement. At ground level the stairs are separated by a door to prevent occupants from continuing to discharge to basement level.
- 4.4.2 Single stair buildings should not connect to basement car parks. To justify this arrangement, a mechanical smoke ventilation system is required in the car park. CFD modelling will be required to

show that this mechanical smoke control system prevents smoke from entering the stair. In addition, it is recommended that:

- The stairs are separated from the car park by a minimum of 2 lobbies;
- The lobby closest to the car park should be provided with a smoke ventilation system.

4.4.3 This arrangement carries with it an approvals risk and early engagement with Building Control / Fire Service to discuss and agree acceptance criteria is required

4.4.4 At basement level the stairs are protected by a double lobby. The lobby will be ventilated by 0.4m² permanently open vent that will be ducted direct to outside.

4.5 Horizontal means of escape - Duplex

- 4.5.1 The Duplex houses in Block H will be provided with a single protected stair. The protected stairway which will serve each habitable room shall be enclosed in 30 minutes fire-resistance and shall discharge directly to outside.
- 4.5.2 Protected stairways should be kept fire sterile. Bathrooms can be included within the 30 minutes fire resisting enclosure of the stairway. An indicative layout of a typical duplex house with a protected stairway is shown in Figure 27.

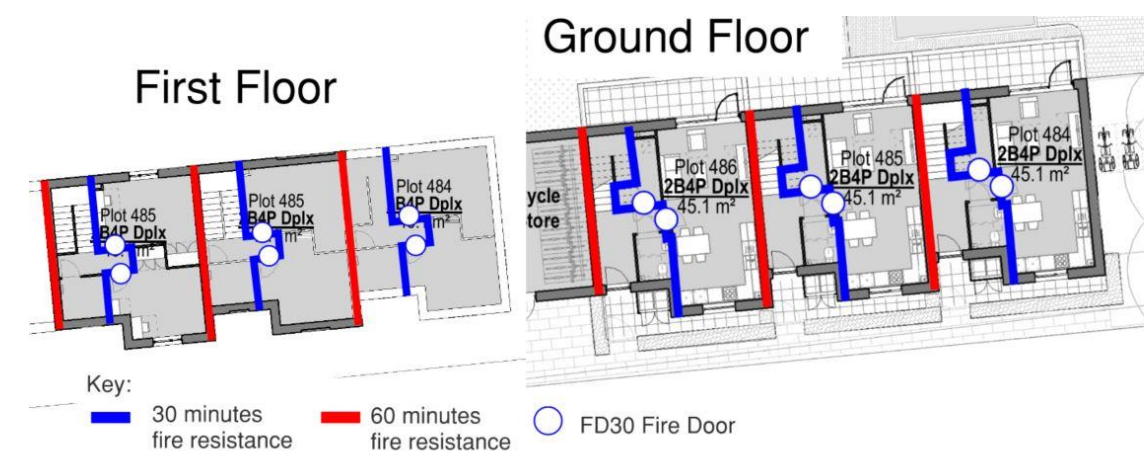


Figure 27 - Typical layout of houses provided with a protected entrance hall (Block H)

4.6 Horizontal means of escape - Commercial Units

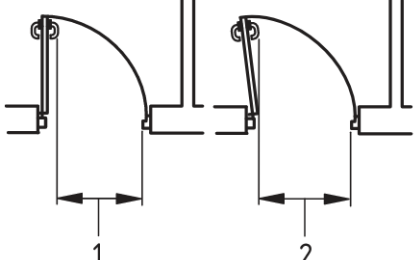
- 4.6.1 This fire strategy is for the shell and core of the commercial unit. A fire strategy for the fit out of the commercial unit should be prepared in accordance with the guidance contained in BS 9999. The parameters provided below are extracted from BS 9999 and are for informative purposes only.
- 4.6.2 The maximum permitted travel distance for the various areas are to be in accordance with the limits summarised in Table 8, with the occupancy to be supported by exits of adequate capacity as summarised in Table 9 and illustrated in Figure 28.
- 4.6.3 Corridors and escape routes are required to have a minimum clear width of 1200mm. The stairs - if provided at fit out are required to have a minimum clear width of 1000mm.
- 4.6.4 Doors are required to have a minimum clear width of at least 800mm, or 850mm where unassisted wheelchair users are expected.

4.6.5 Where an area has an occupancy of greater than 60 people, at least two exits are to be provided. The largest exit provided is to be discounted when calculating the required width for the remaining exits.

Table 8 Travel distance limitations

Risk profile	Recommended maximum travel distance	
	Single direction (m)	Multi-direction (m)
B2	20	50
Notes: The above figures are for actual travel distance, applicable where the internal layout is known. Where the internal layout is not known, the travel distance shall be limited to two-thirds of the above figures.		

Table 9 - Exit width capacity factors

Risk profile	Exit component	Minimum exit width per person
B2	Doors, corridors and escape routes	4.1 mm/ person
	Stair serving one floor	4.8 mm/ person
Notes: Capacity of door with a clear width less than 1050mm shall be assessed on the basis of: 'Door capacity' = 500mm/exit factor. Doors shall have a minimum clear width of 800mm, 850mm where unassisted wheelchair users are expected. Exit widths are for clear widths measured in accordance with Figure 14 in BS9999 as per below:		
 <div style="margin-left: 20px;"> Key 1 Effective clear width (door stop to projecting building hardware) 2 Effective clear width (door stop to door leaf) </div>		

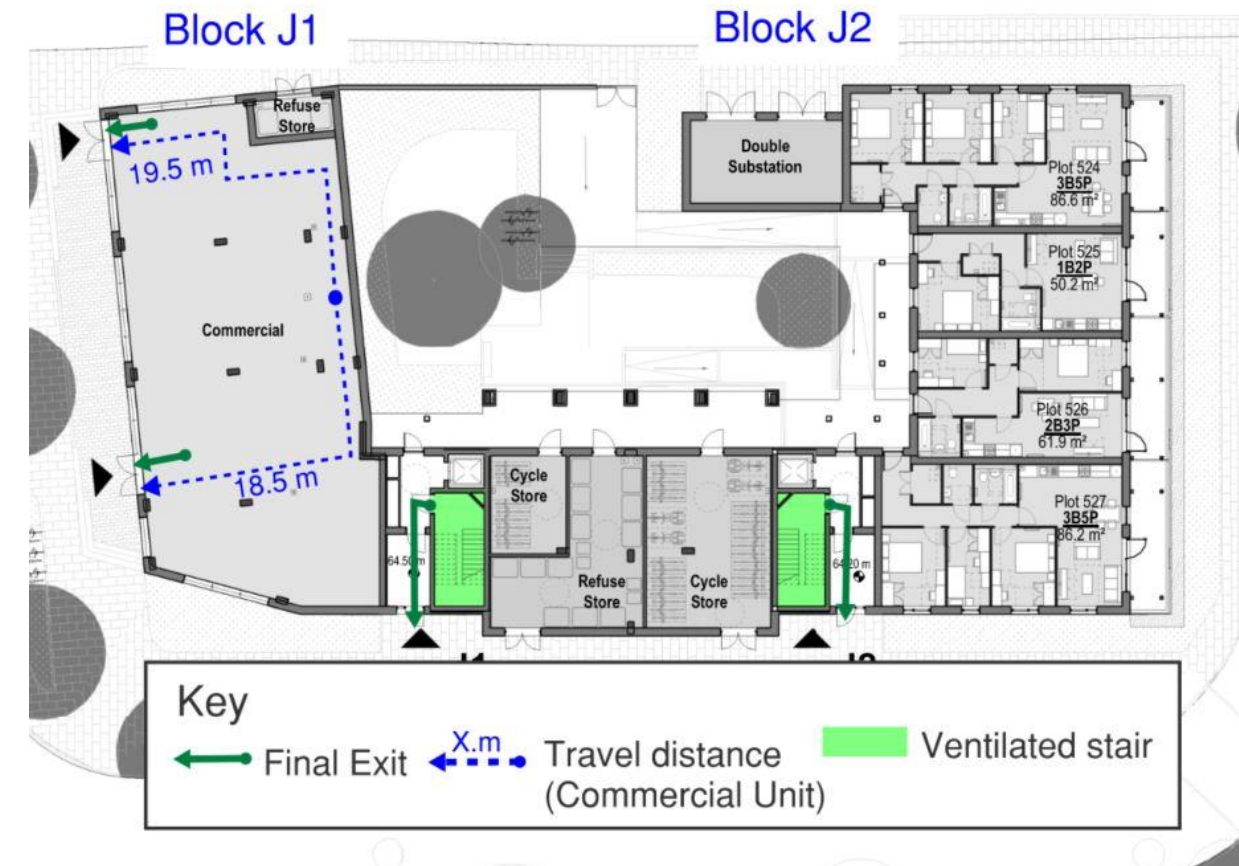


Figure 28 Means of escape Commercial Unit (Shell & Core only – review required at fit out)

4.7 Means of Escape – Basement Car Park

4.7.1 There are seven stairs serving the car park, six connect to the residential blocks and one connects direct to outside at ground level. Maximum permitted travel distances within the car park are 18.0m in one direction and 45.0m where two means of escape are provided. Means of escape from the Car Park are illustrated in Figure 29.



Figure 29 Means of escape from basement car park

4.8 Means of Escape from Ancillary Accommodation

4.8.1 Travel distances within refuse stores, cycle rooms and plant room should be designed in accordance with BS 9991: Clause 37, Table 14 as follows:

- Travel in one direction = 9.0m
- Travel in alternative direction = 18.0m

4.8.2 The design layouts have been reviewed and travel distances within the ancillary accommodation are in compliance with those detailed above.

4.9 Vertical means of escape

4.9.1 In accordance with BS 9991 guidance, stairs are required to have a minimum clear width of 750mm. Where a firefighting shaft is provided the stair should be designed to have a minimum clear width of 1100mm.

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

4.10 Private balconies and communal terraces

4.10.1 Private balconies should meet the following recommendations:

- The escape routes from the balcony should not pass through more than one access room;
- A detection and alarm system in accordance with BS 5839-6 shall be provided to the access room with an alarm system on the balcony;
- The maximum permitted travel distance from the balcony access door to the furthest point on the balcony is 7.5m.

4.10.2 The terrace should be provided with an alarm system which shall be sounded upon activation of fire detection and alarm system within the communal areas.

4.10.3 Balconies and terraces should be designed in accordance with BS 8579:2020.

4.10.4 It should be noted that the blocks over 18m are classified as a 'relevant building' under Regulation 7 (4). Therefore, a balcony is considered a specified attachment and should be constructed of materials achieving class A2-s1, d0 or A1 classified in accordance with BS EN 13501-1:2007+A1:2009.

4.11 Escape beyond final exits

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

5. PASSIVE FIRE PROTECTION

5.1 Internal wall and ceiling linings

- 5.1.1 All wall and ceiling linings within the building should meet the recommendations of BS 9991 when tested under the European Classifications (in accordance with BS EN 13501-1 [11]) as summarised in Table 10.
- 5.1.2 The surface linings of walls and ceilings should generally conform to the classification recommended above for the appropriate location. However, parts of walls in rooms may be of a lower class but not lower than European Class D-s3, d2, provided that the floor area of those parts in any one room does not exceed half of the floor area of the room, subject to a maximum area of 60 m².

Table 10 – Surface spread of flame requirements

Location	National Class	Euro Class
Small rooms ≤ 4m ²	Class 3	D-s3, d2
Other rooms	Class 1	C-s3, d2
Circulation spaces (within dwellings)	Class 1	C-s3, d2
Circulation spaces (communal)	Class 0	B-s3, d2

5.2 Structural Fire Resistance

- 5.2.1 The required period of fire resistance of the structural elements has been based upon the recommendations in Table B3 and Table B4 of ADB Vol 1; 2019. For the block of flats, the structural elements are required to achieve at least 60 or 90 minutes fire resistance, dependent on the height of the building – see Summary Table 1 and Table 11 for details.
- 5.2.2 The structural elements of the two storey duplex houses within Block H shall achieve at least a minimum rating of 30 minutes.
- 5.2.3 Where a construction element with lower fire resistance supports or provides stability to another element of structure, then the protection to the supporting structure should be at least the same as the structure it is supporting.
- 5.2.4 Elements of structure that only supports a roof do not require fire resistance. Structure is considered to support more than only a roof if it supports a load other than the roof itself (e.g. rooftop plant) or is essential to the stability of a fire-resisting wall (internal or external).

5.3 Compartmentation and fire-resisting construction

- 5.3.1 All floors within the block of flats are required to be built as compartment floors and should achieve the minimum level of fire resistance as detailed in Table 11.
- 5.3.2 Flats should be individually separated from the rest of the building by fire rated construction achieving a minimum of 60 minutes fire resistance.
- 5.3.3 The upper floors of the duplex houses should have the same fire resistance as the structure of the building. It should be noted that the floors within the houses are not required to be compartment floors.

- 5.3.4 Duplex Houses in Block H and Duplex Apartments in B2 and C2 should be provided with a protected stairway. The stairway should be provided with 30 minutes fire resistance (load-bearing, insulation and integrity) on each side separately and should lead directly to outside.
- 5.3.5 The duplex houses are required to be separated from each other by a compartment wall achieving at least 60 minutes fire resistance.
- 5.3.6 Commercial Unit in Block J1 shall be separated from the residential units by a compartment wall and floor achieving at least 60 minutes fire resistance.
- 5.3.7 The basement car park shall be separated from the residential blocks by fire rated construction achieving at least 90 minutes fire resistance.
- 5.3.8 Fire doors should be provided in accordance with the recommendations detailed in section 5.4 of this report.
- 5.3.9 The resistance requirements applicable to this development are summarised in Table 11 below:

Table 11 – Fire resistance requirements for the block of flats at Victoria Quarter Development

Block	Number of Storeys	Height (m) (Measured to FFL of top most occupied floor)	Structural Fire Resistance (minutes)	Sprinkler (Y/N)	External Balcony Approach to Flat	Connected to Basement Car park (Y/N)
Block A	8 (G+7)	22.05 m	90	Y	N	N
Block B1	7 (G+6)	18.9m	90	Y	N	Y
Block B2	6(G+5)	15.75m	60	Y	N	Y
Block C1	7 (G+6)	18.9 m	90	Y	N	Y
Block C2	7(G+6)	18.9m	90	Y	N	Y
Block D1	7(G+6)	18.9m	90	Y	N	Y
Block D2	7(G+6)	18.9m	90	Y	N	Y
Block E	7 (G+6)	18.9m	90	Y	Y	N
Block F4	7(G+6)	18.9m	90	Y	N	N
Block F3	6(G+5)	15.75m	60	Y	N	N
Block F2	6(G+5)	15.75m	60	Y	N	N
Block F1	5(G+4)	12.6m	60	Y	N	N
Block G	5(G+4)	12.6m	60	Y	N	N
Block J1	5(G+4)	12.6m	60	Y	Y	N
Block J2	5(G+4)	12.6m	60	Y	Y	N
Block H	4(G+3)	10.45m	60	N	Y	N

separation should be fire-stopped using a system which will achieve the same fire resistance rating as the penetrated wall or floor.

5.6 Cavity barriers and concealed spaces

- 5.6.1 Cavity barriers are provided in order to prevent the rapid spread of unseen fire or smoke in voids, and to prevent the spread of fire around compartmentation via voids. Extensive internal concealed cavities (e.g. roof voids or the void between suspended ceilings and the soffit of the floor above) generally require cavity barriers to sub-divide them.
- 5.6.2 All cavity barriers should have a fire resistance rating of at least 30 minutes for integrity (E) and 15 minutes for insulation (I). In general, cavity barriers should be at 20 m centres in cavities with exclusively Class C-s3, d2 linings or better. For other linings, the spacing between cavity barriers should be reduced to 10 m.
- 5.6.3 Cavity barriers provided around openings within the external wall may be formed of:
- steel at least 0.5mm thick or timber at least 38mm thick; or
 - polythene-sleeved mineral wool, or mineral wool slab under compression when installed cavity; or
 - calcium silicate, cement-based or gypsum-based boards at least 12mm thick.

5.4 Fire doors

- 5.4.1 Fire doors should be in accordance with the recommendations of Table 12 in BS 9991.
- 5.4.2 Fire door assemblies shall comply with:
- BS 476-22 [12] or BS EN 1634-2 [13] for fire resistance; and where applicable,
 - BS 476-31 [14] or BS EN 1634-3 [15] for smoke leakage.
- 5.4.3 Smoke seals are indicated by the suffix 'S' (to BS 476-31) or 'Sa' (to BS EN 1634-3) and are required in all doors which form the enclosure to protected escape routes.

5.5 Fire-stopping and penetrations through fire-resisting construction

- 5.5.1 Fire-stopping should be provided at the junction of fire-separating walls and external walls in order to maintain the fire resistance period of fire-separating walls, and thereby prevent a fire from travelling around the junction and into the neighbouring space. Penetrations through lines of fire-resisting

6. EXTERNAL FIRE SPREAD

6.1 External wall construction – Buildings over 18m

- 6.1.1 Under current regulations, buildings with a height greater than 18m are classed as a 'relevant building' in accordance with Regulation 7(4).
- 6.1.2 The building is required to satisfy Regulation 7(2), where it states: "building work shall be carried out so that materials which become part of an external wall, or specified attachment, of a relevant building are of European Classification A2-s1, d0 or A1, classified in accordance with BS EN 13501-1:2007+A1:2009 entitled "Fire classification of construction products and building elements. Classification using test data from reaction to fire test" (ISBN 978 0 580 59861 6) published by the British Standards Institution on 30th March 2007 and amended in November 2009."
- 6.1.3 The information in paragraph 6.1.2 does not apply to:
- Cavity trays when used between two leaves of masonry;
 - Any part of a roof (other than any part of a roof which falls within paragraph (iv) of regulation 2(6)) if that part is connected to an external wall;
 - Door frames and doors;
 - Electrical installations;
 - Insulation and water proofing materials used below ground level;
 - Intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1;
 - Membranes;
 - 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.
- 6.1.4 The provisions of Regulation 7 apply in addition to requirement B4. Therefore, in addition to paragraph 6.1.2 above, the potential impact of any products incorporated into or onto the external walls and specified attachments should be carefully considered with regard to their number, size, orientation and position.
- 6.1.5 Particular attention is drawn to the following points:
- Membranes used as part of the external wall construction above ground level should achieve a minimum of class B-s3, d0;
 - Internal linings should comply with the guidance provided in Section 5.1;
 - Any part of a roof should achieve the minimum performance as detailed in Section 6.3;
 - As per Regulation 7 (3), window frames and glass (including laminated glass) are exempted from Regulation 7 (2). Window spandrel panels and infill panels must comply with Regulation 7 (2);
 - Thermal breaks are small elements used as part of the external wall construction to restrict thermal bridging. There is no minimum performance for these materials. However, they should not span two compartments and should be limited in size to the minimum required to restrict the thermal bridging (the principal insulation layer is not to be regarded as a thermal break).

- Regulation 7 (2) only applies to specified attachments. Shop front signs and similar attachments are not covered by the requirements of Regulation 7 (2), although attention is drawn to the point below;
- While Regulation 7 (2) applies to materials which become part of an external wall or specified attachment, consideration should be given to other attachments to the wall which could impact on the risk of fire spread over the wall.

6.2 External wall construction – blocks with a height less than 18m

- 6.2.1 Blocks with a height less than 18m are not classified as relevant building under Regulation 7(4).
- 6.2.2 The external walls within buildings less than 18m should achieve either of the following:
- Meet the performance criteria given in BRE report BR 135 for external wall using full-scale test data from BS 8414-1 [16] or BS 8414-2 [17]; or
 - Follow the provisions given below:
 - External surfaces should meet the recommendations detailed in Table 12
 - Cavity barriers should be in accordance with Section 5.6.
- 6.2.3 The external surface of the walls should comply with Table 12 The provisions in Table 12 apply to each wall individually in relation to its proximity to the relevant boundary.

Table 12 External surface of walls

Building height	Less than 1m from boundary	More than 1m from boundary
Height ≥ 18 m - relevant building as defined in Regulation 7(4) - Block A, B & C	A2-s1, d0 or better	A2-s1, d0 or better
Less than 18m - Block E	Class B-s3, d2 or better ⁽¹⁾	No provisions
Note: 1) Profiled or flat steel sheet at least 0.5mm thick with an organic coating of no more than 0.2mm thickness is also acceptable.		

6.3 Roof coverings

- 6.3.1 The relevant test and classification standards for the external fire performance of roof systems are BS 476-3 [18] (National Class) and BS EN 13501-5 [19] (European Class).
- 6.3.2 Table 13 below summarises the separation distances from the boundary according to the type of roof covering as described in section 35.4 of BS 9999.

Table 13 – Limitations on roof coverings

Distance from relevant boundary	National Class	AA, AB or AC	BA, BB or BC	CA, CB or CC
	European Class	B _{ROOF} (t4)	C _{ROOF} (t4)	D _{ROOF} (t4)
Less than 6m		✓	✗	✗
At least 6m		✓	✓	✗
At least 20m		✓	✓	✓

6.4 Space separation and unprotected areas of the façade

- 6.4.1 Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls. This heat can be enough to set fire to nearby buildings. In order to reduce the chance of this occurring, the Building Regulations place limits on the area of the external elevation with no fire resistance, known as the unprotected area.
- 6.4.2 The relevant boundaries are the reference point at which the potential for fire spread, being:
- the site boundary;
 - a notional boundary created on the centreline of an adjacent carriage way; or
 - a notional boundary created midway between this building and the nearest adjacent building.
- 6.4.3 It should be noted that where an external wall is within 1.0m from the relevant boundary, that external wall shall have 0% unprotected area and is required to have the same fire resistance as the structure of the building.
- 6.4.4 In accordance with BS 9991 guidance, the external fire spread assessment shall be carried out using the enclosing rectangle method as detailed in BRE187. Where the external elevation will be required to be protected, the external wall within the relevant elevation shall be fire rated in accordance with Table 5.
- 5.3.5 The assessment for space separation requirements will be carried out at the next stage of the project.

7. ACCESS AND FACILITIES FOR THE FIRE AND RESCUE SERVICE

7.1 Vehicle access to and around the site

- 7.1.1 All blocks shall be provided with a dry riser main. FRS vehicle access shall be provided to within 18m and within clear sight of the dry riser inlet to facilitate personnel access and connectivity with firefighting equipment.
- 7.1.2 FRS access shall be provided to within 45m to all points within the duplex houses in Block H, measured on a route suitable for laying hose.
- 7.1.3 Fire and rescue service appliances should not reverse more than 20m, otherwise, suitable turning facilities shall be provided.
- 7.1.4 The access route requirements are provided in Table 14 are generic recommendations for a pump-type appliance taken from Table 20 of BS 9999. Fire and rescue service appliances are not standardised, therefore vehicle access provision should be discussed and agreed with the local fire and rescue service to ensure their vehicle complies with the parameters listed in Table 14.
- 7.1.5 The detailed vehicle access provisions for firefighting appliances will need to be developed as part of the wider masterplan design and discussed and agreed with the local fire and rescue service.

Table 14 -Typical pump-type firefighting appliance access requirements

Minimum access route specification	Dimension
Width between kerbs	3.7 m
Width between gateways	3.1 m
Turning circle between kerbs	16.8 m
Turning circle between walls	19.2 m
Clearance height	3.7 m
Carrying capacity	15.0 tonnes

- 7.1.6 Fire and rescue service access is indicatively illustrated in Figure 30 and Figure 31.
- 7.1.7 A site plan identifying the location of fire hydrants and dry riser inlet points should be provided for review.



Figure 30 Indicative Route for Fire Service Access (1 of 2)



Figure 31 Indicative Route for Fire Service Access (2 of 2)

7.2 Access into and through the building

- 7.2.1 Access to each block shall be provided at Ground Floor level. Access to the upper floors of each block is facilitated by a protected stairway. On the blocks higher than 18m, the protected stair will be firefighting stairs part of a firefighting shaft, see 7.4.
- 7.2.2 All doors giving access to the interior of the building will have a minimum width of 750mm.
- 7.2.3 Each block will be provided with a dry riser. Dry-risers outlets will be located within the stairway on the full landing at each level. The maximum horizontal pipe run permitted for a dry rising main is 18m in accordance with BS 9990. The dry-rising main shall be designed and installed in accordance with BS 9990.
- 7.2.4 The remotest point of each storey within the block of flats should be within 60m reach of the fire main outlet, measured on a route suitable for laying hose.
- 7.2.5 Any point on the floor plate of non-residential area should be within 45m distance from the FRS vehicle parking position or 60m from dry-riser outlets, measured on a route suitable for laying hose.
- 7.2.6 Premises information box shall be provided in the main entrance lobbies to each core.

7.3 Firefighting facilities

- 7.3.1 All stair cores with a top floor located at more than 18m above the access level shall be designed as a firefighting shafts. The firefighting shaft should comprise a firefighting stair with a dry-rising main and a firefighting lift.
- 7.3.2 The firefighting lift shall be designed and installed in accordance with BS EN 8-1-72 [20]. The firefighting lift doors should be located within 7.5m of the entrance to the firefighting stair.
- 7.3.3 The outlet for each dry riser is to be located within the stair core on the full landing of the stair. All dry rising fire mains will be designed in accordance with BS 9990.

7.4 Firefighting facilities

- 7.4.1 Block A, B1, C1, C2, D1, D2, E, and F4 have a top floor located above 18m, therefore a firefighting shaft should be provided in these blocks. The firefighting shaft should comprise a firefighting stair with a dry-rising main and a firefighting lift.
- 7.4.2 The firefighting stairs should have a minimum clear width of at least 1100mm.
- 7.4.3 The firefighting lift shall be designed and installed in accordance with BS EN 8-1-72. The firefighting lift doors should be located within 7.5m of the entrance to the firefighting stair.
- 7.4.4 The outlet for each dry riser is to be located within the stair core on the full landing of the stair. All dry rising fire mains will be designed in accordance with BS 9990.

7.5 Water supplies

- 7.5.1 Hydrants will be required in the vicinity of the building to support firefighting operations.
- 7.5.2 If the building is more than 90m from an existing hydrant, hydrants should be provided within 90m of the entry point to the building and not more than 90m apart. Where a dry-rising main is provided, the hydrants should be provided within 90m of dry riser inlet.
- 7.5.3 If fire hydrants are to be installed, they should be included as part of a ring fire main system. They should preferably be sited immediately adjacent to roadways or hard-standing facilities suitable for fire and rescue service appliances. To ensure that they remain usable during a fire, they should be sited

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

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

7.6 First-aid firefighting

- 7.6.1 First-aid firefighting provisions should be assessed and provided as part of the fire risk assessment for the development, including consideration for the day-to-day management of these provisions.

In general, fire points should be located within the ancillary areas presenting a significant fire risk and to ensure coverage of at least one fire point for every 200m² of floor area. The type and size of extinguisher(s) at each fire point should be chosen in accordance with the guidance given in BS 5306.

APPENDIX A – DRAWING REGISTER

This outline fire strategy is based on information provided by the design team to Ashton Fire as listed in Table 15 below. The drawings detailed were received by Ashton Fire on 21st June 2021.

Table 15 – Referenced Drawings

Drawing Name	Drawing Number	Revision	Author
Ground Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6001	P6	EPR Architects
Ground Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6002	P6	
First Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6011	P5	
First Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6012	P5	
Second Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6021	P5	
Second Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6022	P5	
Third Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6031	P5	
Third Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6032	P5	
Fourth Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6041	P5	
Fourth Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6042	P5	
Fifth Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6051	P5	
Fifth Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6052	P5	
Sixth Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6061	P5	
Sixth Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6062	P5	
Seventh Floor Plan – Part 1/2	11049-EPR-00-00-DR-A-03-6071	P5	
Seventh Floor Plan – Part 2/2	11049-EPR-00-00-DR-A-03-6072	P5	
Basement Floor Plan	11049-EPR-00-00-DR-A-03-6000	P5	



With over 140 years' combined experience in fire safety, Ashton Fire engineers have dealt with hundreds of successful fire engineering projects across the UK and worldwide.

Highly qualified as well as well as highly skilled, Ashton Fire is represented on many professional bodies, industrial committees and have a culture of continuous improvement.



Chartered Members with the
Engineering Council



Fire Industry Association



Institute of Healthcare Engineering
and Estate Management Member



Institution of Fire Engineers
Member

London

Birmingham

Oxford

Eastbourne

Taiwan

T: 0203 9956 600 or 0121 8099 700 | E: enquiries@ashtonfire.com | W: www.ashtonfire.com