

FIRE STRATEGY REPORT

St Ann's New Neighbourhood Phase 1a Block D

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Reference Number:

AFF_20708-04_St Anns Block D_FSR_04

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REPORT DETAIL

Project:St Ann’s New Neighbourhood, Block D

DocumentFire Strategy Report

Report No.:AFF_20708-04_St Anns Block D_FSR_04

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1 INTRODUCTION



1.1 Introduction

This report has been developed to address Condition 68 of the Hybrid consent whereby each reserved matter(s) application for layout, scale and appearance shall be accompanied by a detailed fire statement in order to meet Gateway One or equivalent. The development shall thereafter proceed in accordance with recommendations and mitigation measures recommended in the statement. This is to ensure that the development incorporates the necessary fire safety measures in accordance with the Mayor's London Plan Policy D12.

St Ann's New Neighbourhood comprises residential development split into several phases. Phase 1a proposes 240 new build units across two residential blocks of flats (Block C and D). Each block will have three cores. Adjoining these two blocks, two terraced town houses (A and B) will be constructed.

Figure 1 highlights Block D in red as well as outlines phase 1a in blue.



Figure 1: Site Plan (proposed landscape)

The building is located in northern London and is cornered by St Ann’s Road as well as Warwick Gardens.

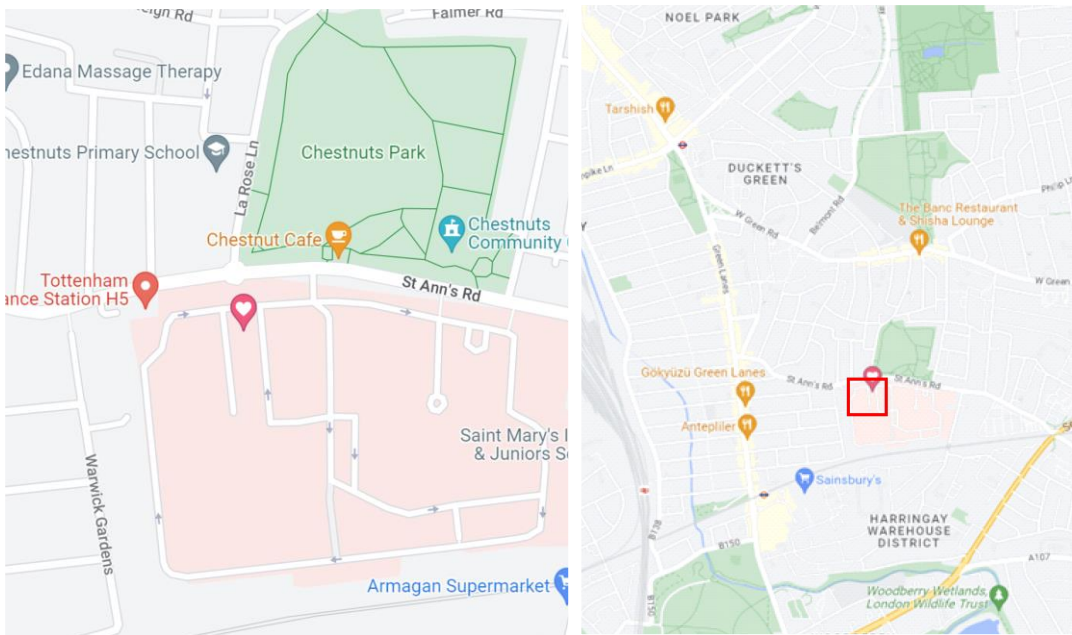


Figure 2: Excerpt from Google Maps

1.2 Scope

This Fire Strategy Report (FSR) has been prepared in support of the design and approvals process for St Ann's New Neighbourhood, Block D, so as to provide strategic design and performance criteria which, when met by the design of the building, are designed to enable all stakeholder requirements to be met.

1.3 Relevant Stakeholders

This Fire Strategy Report has been developed collaboratively with the relevant stakeholders as identified below:

Table 1: Relevant Stakeholders

Name	Role	Organisation
Catalyst	Project Manager	Catalyst
Jomel Allen	Project Manager	Hill Group
Damon Willicombe	Project Manager	Hill Group
Jag Bains	Project Manager	Hill Partnership Limited
Paul Edwards	Structural Engineer	Meinhardt
Hangyu Li	Project Engineer	Affinity Fire Engineering (UK) Ltd.
Maximillian Dangelmaier	Project Manager	Affinity Fire Engineering (UK) Ltd.

Name	Role	Organisation
Jeremy Ockenden	Project Director	Affinity Fire Engineering (UK) Ltd.

1.4 Stakeholder Requirements

The following stakeholder requirements have been identified for this project:

Table 2: Stakeholder Requirements

Class	Regulation / Stakeholder	Requirement
Life Safety	The Building Act 1984	Life safety is to be demonstrated in accordance with the requirements of Parts B1 and B5 of the Building Regulations 2010.
	The Building Regulations B1	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 the case of fire from the building to a place of safety outside the building capable of being safely used at all material times.
	The Building Regulations B2	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 or rate of fire growth, which is reasonable in the circumstances. Where internal lining means the material or products used in the lining of any partition, wall, ceiling or other internal structure.
	The Building Regulations B3	The building shall be constructed so that in the event of fire its stability will be maintained for a reasonable period of time. 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. Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken to an extent appropriate to the size and intended use of the building, comprising either or both of the following: a) Sub-division of the building with fire-resisting construction. b) Installation of a suitable automatic fire suppression system. 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 Building Regulations B4	The external walls of the building shall adequately resist the spread of fire over the walls from one building to another, having regard to height, use and position of the building.

Class	Regulation / Stakeholder	Requirement
Property Protection		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 Building Regulations B5	The building shall be designed and constructed so as to provide reasonable facilities to assist firefighters in the protection of life.
	None	None
Environmental Protection	The Environment Agency	The guidance of PPG18 Managing Fire Water and Major Spillages should be adopted in regard to management of waste fire water. This is to be addressed by the relevant civils designer.
Other	Catalyst Fire Safety Standards	Catalyst Housing Ltd. have set out their own requirements in this document to further enhance the fire safety standards in line with their own policies: • CHG DS 01_02.1 Fire Safety Standards 220520 • CHG DS 01_02.2 Fire Safety Procedures 211119

1.5 Method

1.5.1 The Building Regulations 2010

The Building Act 1984 is the primary legislation under which the Building Regulations and other legislation are made. The Building Regulations 2010 is the Statutory Instrument which seeks to ensure that the policies set out in the Act are implemented.

Compliance with the requirements of the Building Regulations B1 – B5 may be demonstrated via the following:

Meeting Standard Guidance

Demonstrating that design meets the recommendations of the Approved Documents B1 or B2, or other suitable design guidance documents. It must be noted that these guidance documents are specifically created to provide solutions for generic/common buildings, and guidance documents may only relate to specific building or occupancy types.

Development of an Alternative Approach

Any other approach may be adopted to demonstrate that the functional requirements of the Building Regulations have been met. These alternative approaches are commonly referred to as Fire Engineered Solutions.

As a matter of good practice Fire Engineered Solutions should be developed in accordance with the guidance BS 7974 which set out a consistent framework for robustly determining whether the Fire Engineered Solutions will achieve the functional requirements.

In this instance the following approach is adopted; wherever practicable the design of the building will be demonstrated as meeting the relevant guidance of BS 9991, and where the design of the building falls outside the application of this guidance an alternative approach will be developed.

Determination of compliance with the requirements of the Building Regulations is at the jurisdiction of the Approvals Authority, and all design guidance or performance criteria set out within this report are at approvals risk until agreed with the authority.

1.5.2 The Building Regulations 2010 – Regulation 7

The Building Regulations, Regulation 7 requires that materials which are used are appropriate for the circumstances in which they are used, adequately mixed or prepared, and are applied, used or fixed so as to adequately perform the functions for which they are designed. It is noted that report provides performance specifications against which the selection and application of materials must be determined by the design team or principal contractor.

It is noted that the requirements of Building Regulations shall apply to all building works of Block D3.

The Building Regulations 2010 (incorporating the 2018 Amendments) place additional specific regulatory requirements upon materials incorporated into external wall construction for any construction which:

- Has an uppermost storey of >18m, when measured from lowest possible adjoining ground level to the top of the uppermost floor surface of the uppermost storey.

AND

- Has any of the following:
 - One or more dwellings.
 - Contains an institution¹.
 - Contains a room for any residential purpose (excluding any hostel, hotel or boarding house).

Where these requirements apply these will be highlighted as part of **Section 5.1** of this report.

1.5.3 The Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order (RRO) requires that all buildings are managed and maintained so as to afford an adequate standard of life safety for all legal occupants (including visitors) of a building and to provide adequate access and facilities for the Fire Service to undertake their activities within the building.

This Fire Strategy **must** be provided to the Responsible Person under the requirement of the Building Regulations Regulation 38. Additionally:

¹ Means an institution (whether described as a hospital, home, school or other similar establishment) which is used as living accommodation for, or for the treatment, care or maintenance of persons:

- suffering from disabilities due to illness or old age or other physical or mental incapacity. Or
- under the age of five years.

Where such persons sleep on the premises.

- This strategy should form part of the Fire Safety Arrangements under the RRO for the building once occupied.
- This strategy should be provided, and referred to, as part of the Fire Risk Assessment process for the building.
- Any performance requirements made in regard to the management of the building (see 8) should be adopted, or otherwise considered and appropriately modified.

Whilst the RRO does not come into force until after a building has been constructed, reasonable provision should be made in the design and construction of the building to allow for the building to be safely managed and operated in accordance with the RRO. To this end the Approvals Authority has a statutory duty to consult with the relevant Enforcing Authority whom are required to advise on:

- Matter which have to be complied with under the RRO once the building is occupied.
- Matters which have to be complied with to meet any other fire legislation, other than the Building Regulations.
- Advisory but non-enforceable matters, including commentary on the application of the Building Regulation should they choose to do so.

Where the views Enforcing Authority that the design of the building is such that the requirements of the RRO cannot be met they should set down its concerns and recommendations in a formal written case, which may include details of any enforcement action it may take upon occupation.

Determination of compliance with the requirements of the Regulatory Reform (Fire Safety) Order solely is at the jurisdiction of the Enforcing Authority, and all design guidance or performance criterions set out within this report are at approvals risk until agreed with the authority.

1.5.4 The Construction (Design and Management) Regulations 2015

The Construction (Design and Management) Regulations (CDM) require that all parties involved in the design of a building, or whose advice may effect a change upon the design of the building shall be required to:

- Take account of any pre-construction information provided by the client (and principal designer, if one is involved).
- Eliminate foreseeable health and safety risks to anyone affected by the project (if possible).
- Take steps to reduce or control any risks that cannot be eliminated.

This is generally communicated via a Designers Risk Assessment (DRA) which identifies elements of the design which may present construction hazard and identifying what measures may be taken to eliminate the risk or otherwise reduce the hazard presented.

It is noted that this Fire Strategy sets out the minimal performance requirements for the building design and design decision made to meet these performance requirements may not be safely eliminated from the final design. Advice is however provided to the design team in consideration of these risks, and where possible to do so recommendations are made which limit the level of risk during construction, management, maintenance and upkeep of any specific fire safety systems which may be recommended to the design. It is however noted that ultimately Affinity does not provide the design of these systems and a full Risk Assessment process must be undertaken by the designer of that system.

1.6 Limitations

In this instance the Fire Safety Strategy is developed based on applicable limitations and assumptions for the development which are listed as follows. Affinity Fire Engineering (UK) Ltd. accept no liability for where this report is applied outside the limitations stated:

- The information contained in this document is provided for the sole use The Hill Group and applies only to the St Ann's New Neighbourhood Block D. No reliance should be placed on the information by any other person or for any other project.
- This Fire Strategy provides strategic design advice and performance criteria only. This Fire Strategy does not constitute a design document, and the detailed design shall be provided by other parties. Where this document does not provide clear performance criteria all elements of design shall be required to be designed to meet the relevant guidance as set out in **Section 1.5** above and any applicable standards made reference to within.
- This Fire Strategy has been developed based upon the understanding of the building design and usage as set out in **Section 2** below. Any changes in the design or usage of the building may alter the basis upon which the Fire Strategy was developed.
- This Fire Strategy has been developed based upon the information stated in **Section 1.7** below. Any changes to the design of the building subsequent to this information will not be reflected within this Fire Strategy document.
- This Fire Strategy has been developed to meet the fire safety needs of the building as an entire system, and elements of this strategy must not be partially implemented of, or cherry picked.
- This Fire Strategy has been developed on the basis that fire strategy systems within the building are managed and maintained in such a manner that they shall (so far as is reasonable) operate as intended in the instance of fire.
- Fire safety considerations during construction must be addressed under the Construction (Design and Management) Regulations 2015 by the principal contractor, and are not addressed under this report, and this report may not be utilised for the purpose of demonstrating compliance with these regulations unless explicitly otherwise stated.
- Unless explicitly otherwise stated this Fire Strategy does not address any fire safety requirements (or recommendations) in regards to compliance with COSHH (Control of Substances Hazardous to Health Regulations 2002) or DSEAR (Dangerous Substances and Explosive Atmosphere Regulations 2002).

1.7 Sources of Information

This report is based on the following sources of information:

Table 3: Sources of Information

Name	Author	Date
Fire Strategy Report – Phase 1a TS210413-R01-ISSUE03A	Tenos	01/06/2022

Name	Author	Date
Fire Safety Standards Version 3.0 (see also Stakeholder Requirements)	Catalyst Housing Ltd.	20/05/2022
D1 & 2	Karakusevic Carson Architects	
N15301-KCA-D3-00-DR-A-12000 - 12002		28/04/2023 <i>Ref. P04,</i> 12/07/2023
N15301-KCA-D3-00-DR-A-12003 - 12020		01/06/2023 <i>Rev. P01</i>
D3		
N15301-KCA-D3-00-DR-A-12000		28/04/2023 <i>Rev. P03,</i> 04/07/2023
N15301-KCA-D3-00-DR-A-12001		28/04/2023 <i>Rev. P03,</i> 04/07/2023
N15301-KCA-D3-00-DR-A-12002 -12011		01/06/2023 <i>Rev. P01,</i> 01/06/2023
AFF_20708_01_St Ann's New Neighbourhood_FSRR_01	Affinity Fire Engineering (UK) Ltd.	04/12/2023

1.8 Setting Out and Formatting

This report will set out the guidance and performance criteria following the general structure of the Building Regulations, i.e. guidance required to demonstrate compliance with the requirements of The Building Regulations B1 shall be provided within **Section 3 – B1 Means of Warning and Escape**.

2 ARCHITECTURAL REVIEW

2.1 Overview

St Ann's New Neighbourhood is going to be located in the north of London adjoining the compound of St Ann's Hospital. The residential development project consists of several new builds. Phase 1a comprises 240 units across 2 residential blocks, Blocks C and D. Only Block D is addressed in this fire strategy report.

Block D is shown in **Figure 3** and comprises two buildings, D1 & 2 as well as D3. Each block will have a single core.

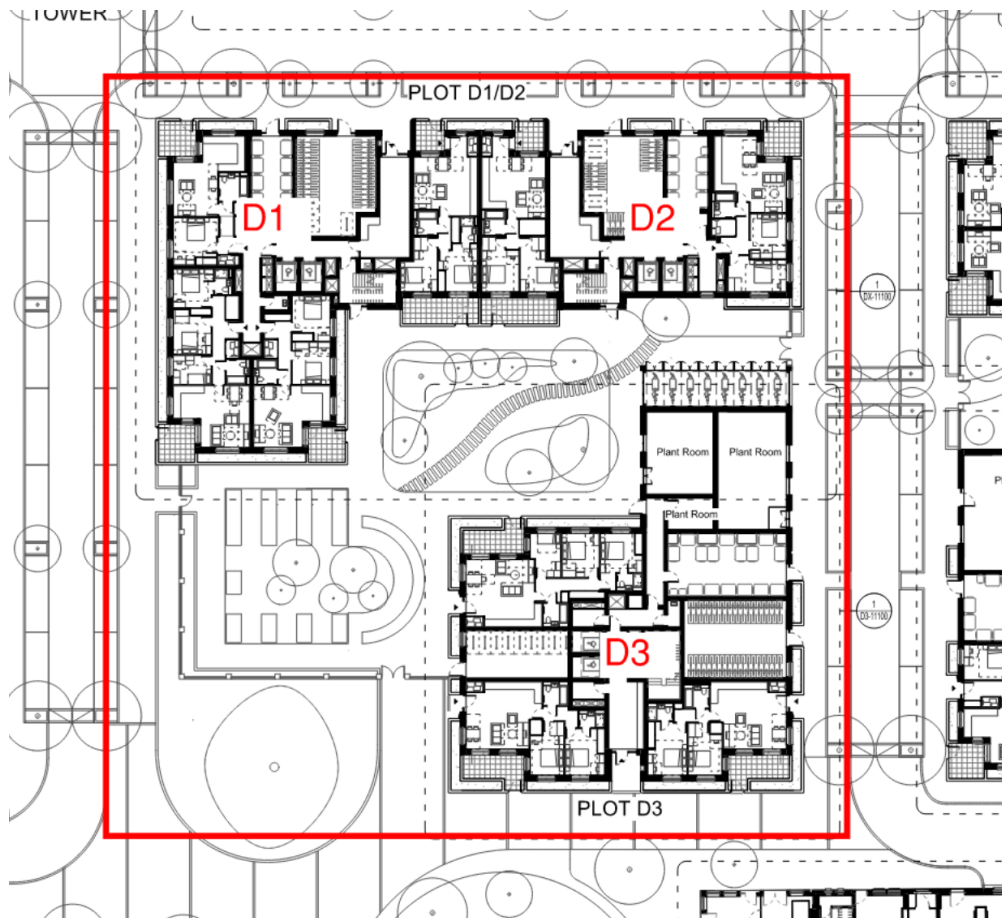


Figure 3: Site Overview of Block D

2.1.1 Major Building Elements

The main usage of the buildings will be residential. Block D1 & 2 comprises the following ancillary spaces on Ground floor:

- Refuse Store.
- Cycle Store (40 spaces).
- Cycle Store (56 spaces).
- Cleaner's Cupboard.

Block D3 comprises the following ancillary spaces on Ground Floor:

- Domestic Water / Sprinklers.
- Life Safety Generator.
- Refuse Store.
- Switchroom.
- Cycle Store (72 spaces).
- Cycle Store (17 spaces).
- Cycle Store (8 spaces).

2.1.2 Building Height

Table 4: Building Heights

Block/Building	1. Mean Ground Floor Level to the Mean Roof Level (m)	2. Lowest Side of Ground Floor Level to the Topmost Habitable Floor Slab (m)	3. Fire Service Access Height (m)
D1 & 2	22.6	16.3	16.3
D3	32.4	25.5	25.5

Note:

1. Total building height, which is measured from mean ground level to mean roof level. This measurement is used for **Section 6** (Surface spread of Flame).
2. The height of top-most storey has been defined by BS 9991 as the height measured from the lowest ground level adjacent to the building to upper floor surface of top floor. This measurement is used for structural fire resistance and combustibility.
3. Firefighting access height, which is measured from fire-fighting access level to the height of the top-most storey. This measurement is used for **Section 7** (Firefighting access).

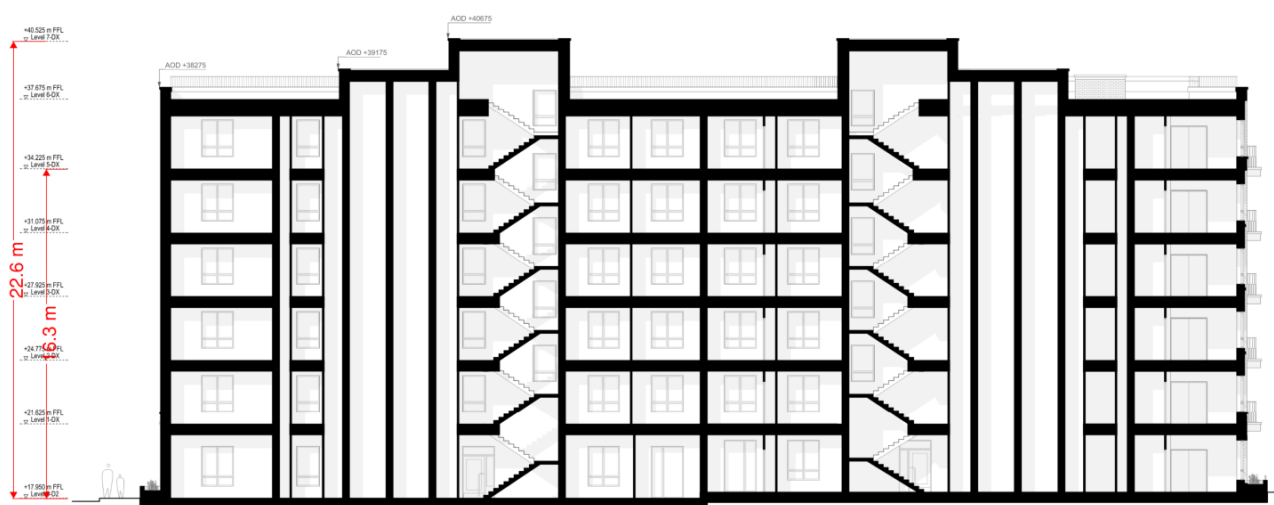


Figure 4: Building Height D1 & 2

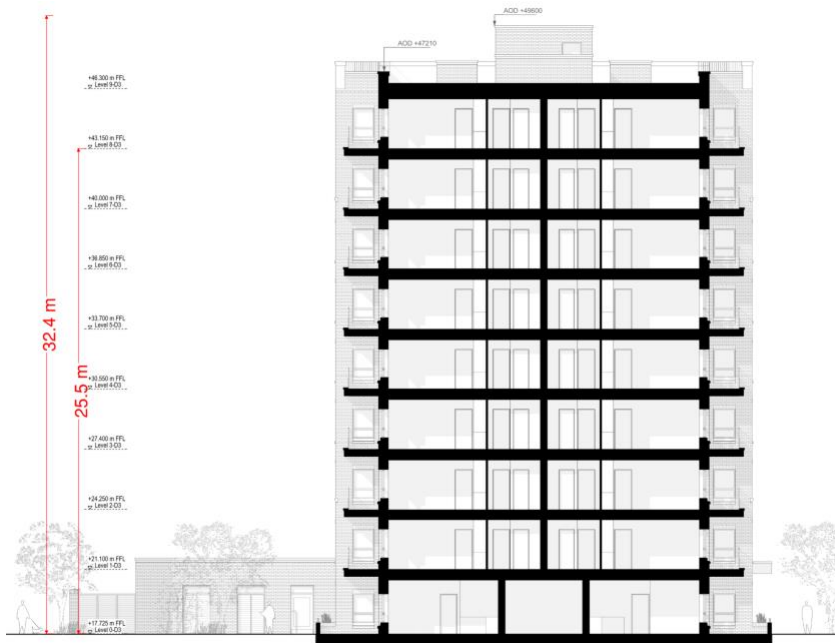


Figure 5: Building Height D3

2.2 Hazards

This Fire Strategy has been developed based upon the following understanding of the fire hazards within the building:

Table 5: Hazard Assessment

Potential Hazards		Commentary
Fuel Sources	Entrance Lobby	The Ground Floor entrance lobby will be provided as a feature entrance to the building and is reasonably expected to contain fuel loading such as soft furnishings or displays.
	Bathrooms	Bathrooms are reasonably expected to have negligible fire loading.
	Stair and stair lobbies	Stair and stair lobbies will be required to be maintained as sterile locations in regards to fire loading. The Fire Strategy places specific management controls on the usage of these spaces.
	Apartments	Fuel loading is generally expected to be typical of a residential accommodation being formed from a mix of furniture and cooking equipment.
	Ancillary Accommodation	The fuel load in the communal spaces is expected to be comparable to residential accommodation.

Potential Hazards		Commentary
Ignition Sources	Electrical and lighting	Other ancillary rooms such as refuse stores comprise higher fuel densities but not exceeding the amount for the intended use.
	Heating appliances	Electrical and lighting installation are expected to be provided as typical for residential accommodation.
	Smoking	Heating appliances are not generally expected to be provided, however small portable heaters may be present. The safe usage of such items should be controlled by Fire Safety Management Plan for each tenancy.
	Cooking	Smoking is to be prohibited in the common parts of the building.
Occupant Factors	Occupant Characteristics	Cooking facilities are permitted as part of the fitting out of apartments and dwellings and are not reasonably expected to be present. For open plan apartments, cooking facilities will be sited a reasonable distance away from escape routes.
	Impairments	Occupants are reasonably expected to both awake, asleep and familiar with the residential parts of the building.
Egress and Wayfinding	Dead-ends and complex wayfinding	Occupants are reasonably expected to have physical and mental impairments in line with national averages.
	Proximity to high hazard locations/processes	All Blocks are provided with dead-end corridors leading towards the protected lobby.
	Exposure to radiant sources	As noted above there should be no high hazard locations on any floor, and as such occupants will not need to pass such areas.
	Residential Usage	Where occupants of the upper floors have a single means of egress from the dead-end corridors there is a risk that occupants may pass within close proximity to the origin point of the fire if deciding to escape upon activation of the fire alarm system. It is however noted that every apartment unit will form its own compartment whereby occupants can take refuge during a fire.
		Typical, residential accommodation is not reasonably expected to present conditions that may impact upon occupant's ability to recognise and respond to fire conditions appropriately

3 B1 MEANS OF WARNING AND ESCAPE

3.1 Evacuation Strategy

The fire strategy design of this residential building has been developed to facilitate a 'Stay Put' evacuation policy, whereby:

- Occupants of the unit of fire origin are reasonably expected to evacuate as soon as they are aware of a fire within their premises.
- Occupants of all other units are not automatically made aware of fire within another unit, and as such are afforded suitable protection against the spread of fire such that they should be able to remain within their own unit in relative safety. This is not to imply that residents should 'stay put' should they wish to evacuate, and suitable provisions are made to allow for occupants to safely egress from the building at any time.

The 'Stay Put' evacuation strategy has been implemented with this building so as to limit the risk that occupants will ignore alarm signals if there are repeated false, or nuisance, alarm activations within the building.

3.2 Fire Detection and Alarm Systems

To facilitate the 'Stay Put' evacuation strategy the following detection and alarm system is to be afforded:

Table 6: Fire Alarm and Detection

Location	Minimum System Category ^A	Comments
Each Unit	Grade D Category LD1	Alarm to be raised in unit of detection only.
Common Corridor	Category L5	To actuate smoke control only, no alarm in any location.
Ancillary Locations	Category M	No automatic alarm and detection to be provided.

Note A: Domestic alarm and detection systems are to be designed and installed in accordance with BS 5839-6 (1), common areas and ancillary locations are to be designed and installed in accordance with BS 5839-1 (2).

Fire Alarm Panels are to be provided within or in close proximity to the entrance to each core.

General Note: It is understood that no galleries and no enclosed balconies are part of the scheme.

These measures comply with **Clause 3.3.** as well as **4.2 Catalyst ER.**

3.3 Automatic Fire Sprinkler System

3.3.1 Block D1& 2

Block D1& 2 with a height <18m is to be provided with a Category 2 standard automatic fire sprinkler system in accordance with BS 9251 (3). The ancillary spaces on ground floor should be provided with a Category 3 system. Exemptions from sprinkler protection are listed in Clause 5.4 of BS 9251.

The system should achieve the following minimum requirements:

- Design discharge density of 2.8mm/min.
- The sprinklers are to remain functional for a minimum of 30min.

The activation of the flow switch should not raise an alarm in any location, it should however be indicated on the fire alarm panel.

3.3.2 Block D3

Block D3 with a height > 18m are to be provided with a Category 4 standard automatic fire sprinkler system in accordance with BS 9251. The Category 4 system is to be extended down to the ancillary spaces. Exemptions from sprinkler protection are listed in Clause 5.4 BS 9251.

The system should achieve the following minimum requirements:

- Design discharge density of 2.8mm/min.
- The sprinklers are to remain functional for a minimum of 60min.

The activation of the flow switch should not raise an alarm in any location, it should however be indicated on the fire alarm panel.

For this Category 4 system an enhanced water supply should be used, which conforms with the additional requirements for water supply as well as pumps. Refer to Clause 5.12.5 of BS 9251.

3.3.3 Ancillary Accommodation

The residential sprinkler system may be extended to serve the following areas:

- Refuse stores <72m².
- Cycle store <100m².
- Plant rooms <100m².
- Limited office areas (Staff Meeting Room) <72m².
- Communal areas <72m².
- Laundry <100m².

All ancillary areas are within this range, therefore are to be served by residential sprinklers.

3.4 Storey Exits and Protected Egress Routes

Block D1 & 2 are accessed by a single stair. The stairs discharge on ground floor directly into the open (Exit 1 and 2). There are other exits on ground floor leading from ancillary accommodation or flats directly to the open. Adjacent to the stairs is the protected lobby (lift lobby) which itself can be accessed via a common corridor.



Figure 6: Egress Ground Floor D1 & 2

On the typical floors in Block D1 & 2 a protected lobby can be accessed via adjacent common corridors. The protected lobby connects to the stairwell (Exit A and B) and is also a lift lobby.

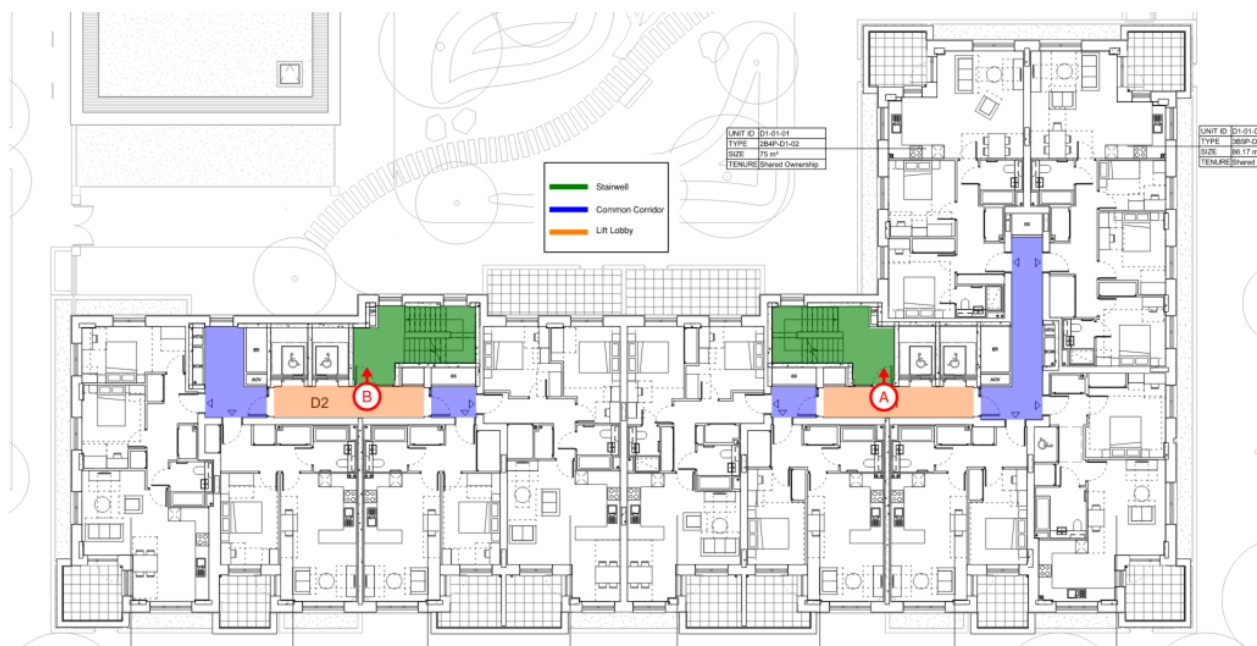


Figure 7: Egress Typical Floor D1 & 2

Block D3 constitutes a single stair building. On ground floor the stair discharges into a protected lobby (Exit 1) as well as in a common corridor (Exit 2).

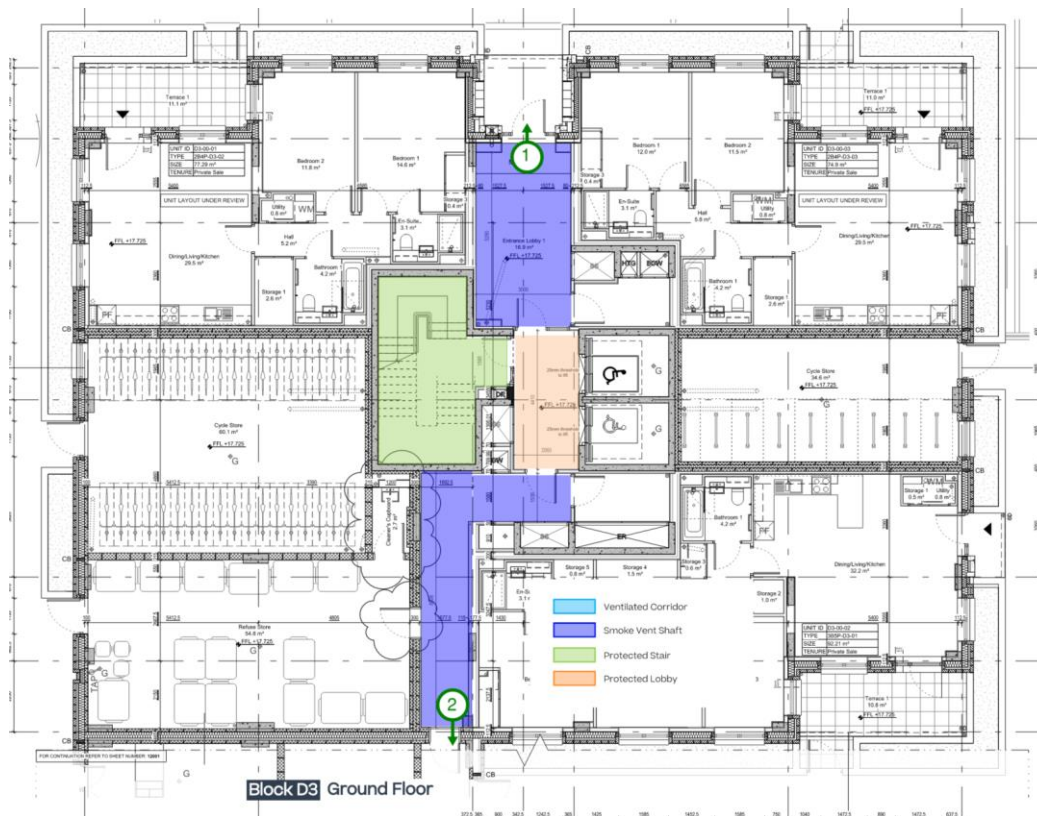


Figure 8: Egress Ground Floor D3

On the upper floors, there is a single stair (Exit A) which can be accessed via the protected lobby. The entrance to the protected lobby is granted through two common corridors which are ventilated.

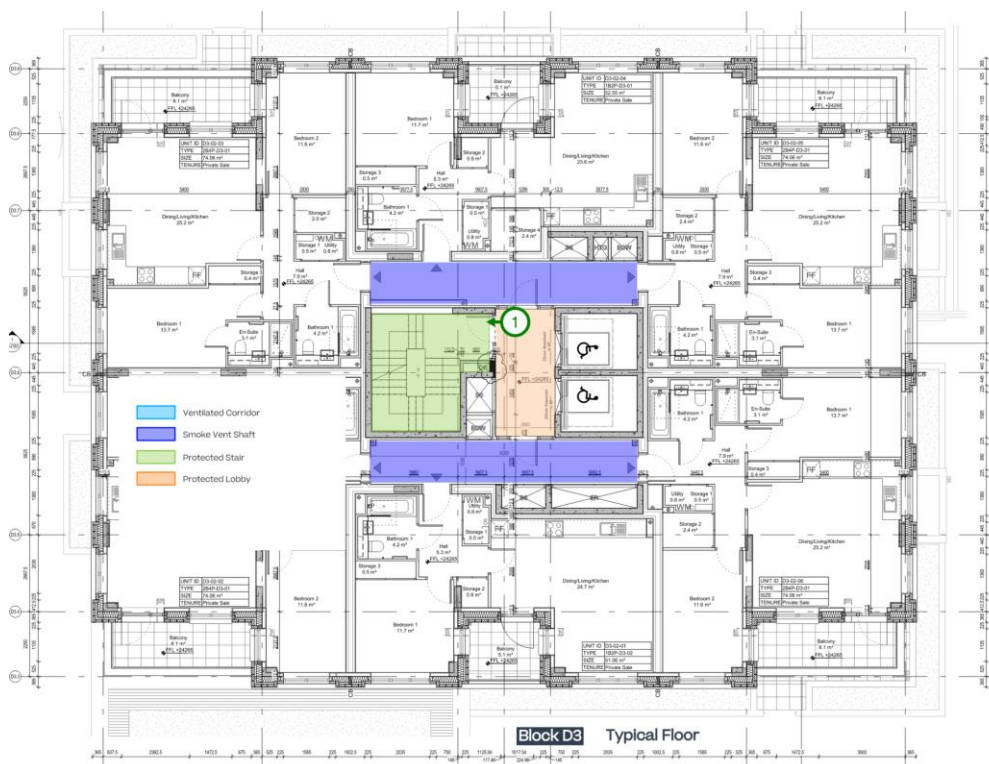


Figure 9: Egress Typical Floor D3

3.4.1 Means of Egress from Flats

The travel distance from any point of the flats to the flat entrance should not exceed 20m in accordance with BS 9991.

Cooking facilities are sited away from the flat entrance doors and internal escape routes. A radiative risk analysis has been undertaken to provide additional guidance on the positioning of cooking facilities within open plan flats. It is therefore our conclusion that cooking facilities should be located no closer than 2m from the egress routes from the unit. See **Appendix B** for the location of cooking facilities assessment.

Note: This is also in line with **Clause 3.3 Catalyst ER**. However, Catalyst ER require a distance of 1.8 m + 0.9 m egress width + 0.3 m distance to door hardware, requiring effectively 3.0 m (opposed to 2.8 m from the assessment in **Appendix B**). This is to be confirmed by the client.

The minimum egress width will be 0.9m and further a distance of 0.3m is required between the flat entrance and the 2m radius mentioned above in order to ensure a person to access the door hardware.



Figure 10: Travel Distances within Flats D1 (left), D2 (centre) and D3 (right)

All open plan flats are assessed as meeting these recommendations.

3.4.2 Means of Egress from Common Residential Areas

In line with Clause 7.4 BS 9991, the maximum travel distance should be 15 m from the flat entrance to the stair door (lift lobby door in this case) where the common corridor is ventilated, and sprinkler provision is provided throughout the building. This requirement is being met in all three blocks.

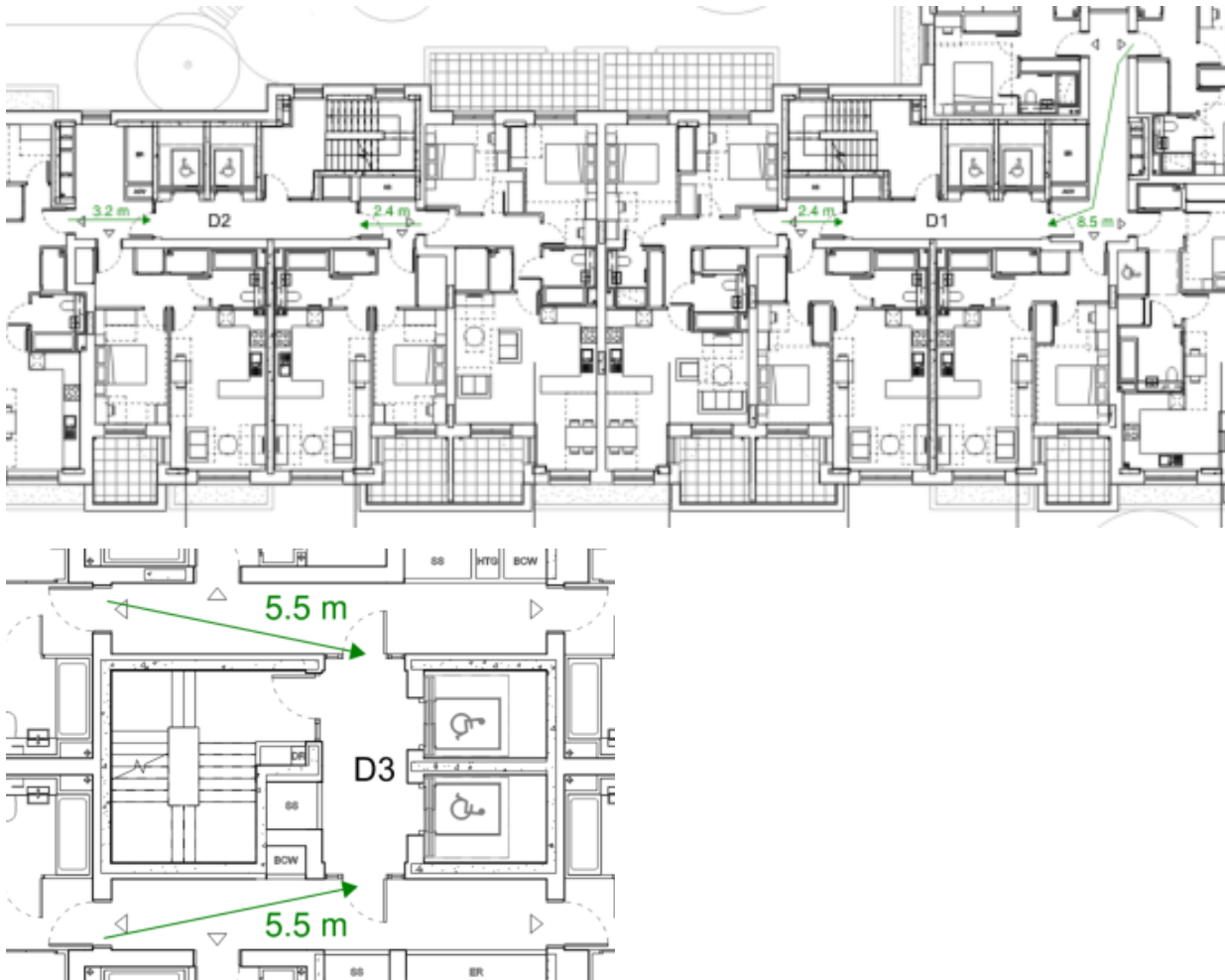


Figure 11: Travel Distances Common Corridors Block D1 & 2 (above) and D3 (below)

On Ground Floor, the D1 & 2 flats D2-00-01 and D1-00-04 and all flats in Block D3 require a direct exit into the open as a mean of egress.

3.4.3 Protected Corridors leading to a Final Exit

On Ground Floor of Block D3, a refuse store can be accessed from the lift lobby through a connecting corridor. Additionally, a riser lobby connects to the final egress corridor. This is acceptable because of the following:

- The stair discharges into a lift lobby. A final exit can be reached through 1 of the 2 adjacent corridors. In the event of smoke ingress into 1 of the 2 corridors, occupants can use the smoke-free egress route.
- Both corridors leading to the final exit are equipped with a mechanical smoke extract system. See **Section 3.8** for further information on the extract system.
- As this residential building facilitates a 'stay put' evacuation strategy (see **Section 3.1**), occupants do not need to leave the building immediately upon detection of a fire within the refuse store or riser lobby.
- The refuse store can be accessed directly from the outside. This allows for firefighting operations to be conducted swiftly and effectively.

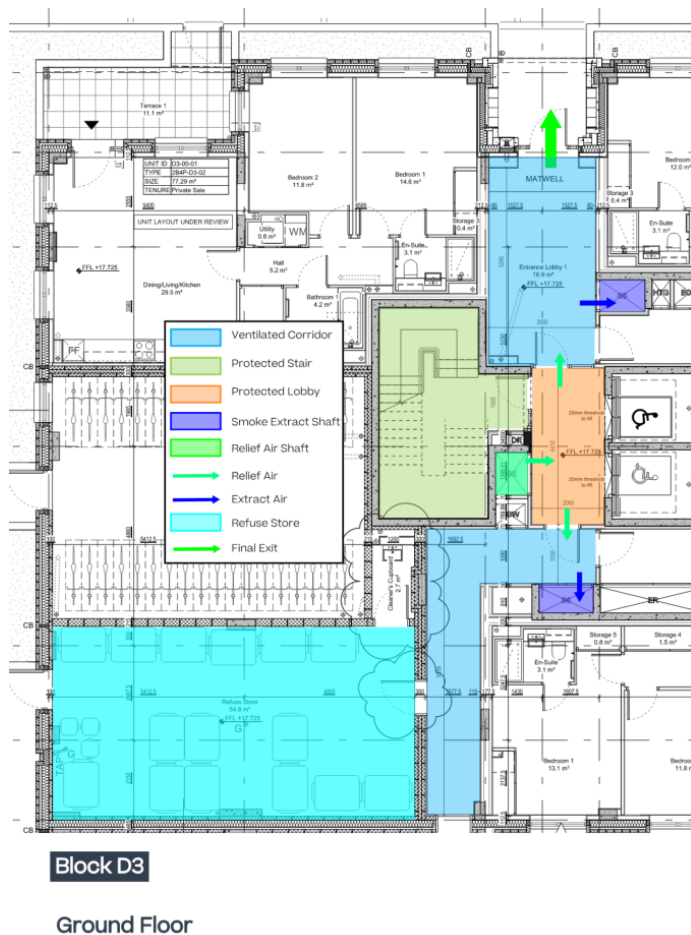


Figure 12: Refuse Store and Riser Lobby Ground Floor | Block D3

3.4.4 Means of Egress from Ancillary

In all buildings the cycle rooms as well as the ancillaries are provided with a direct exit into the open. In Block D3 a LSG Switchroom can only be accessed via the preceding Life Safety Generator Room.

Table 14 BS 9991 sets out the maximum travel distance in one direction only within engineering services installations rooms to be 9m.

LSG Switchroom

The travel distance of 9m mentioned above is exceeded by approx. 0.5m egressing from the LSG Switchroom. This is acceptable because of the following:

- In order to alarm personnel working in the LSG Switchroom, it is deemed necessary to equip the Life Safety Generator Room with a fire detection and alarm system. The detectors in the access room are to be smoke detectors. Following the detection of smoke, an adequate alarm is to be operated within the inner room.
- The LSG Switchroom (inner room) as well as the Life Safety Generator room (access room) share similar use and hazards and are to be used by the same occupier. The LSG Switchroom is not to be used as a habitable room and only personnel who is familiar with the layout of the rooms is to be expected in these rooms.
- The inner room egress route is only to pass through one access room.
- Referring to Table 11 BS 9999 one-way travel distance in a room is accepted up to 18m, on the presumption that personnel is familiar with the layout (i.e. risk profile A3).

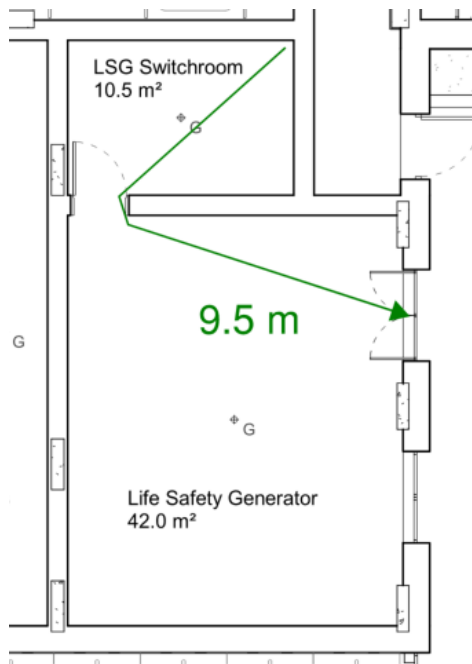


Figure 13: Travel Distance LSG Switchroom Block D3

Domestic Water/Sprinklers

The one-way travel distance is exceeded by 3m from the domestic water/sprinkler room. It is therefore recommended to provide a 2nd exit from the room. It is acceptable for personnel to egress through the adjacent life safety generator room.

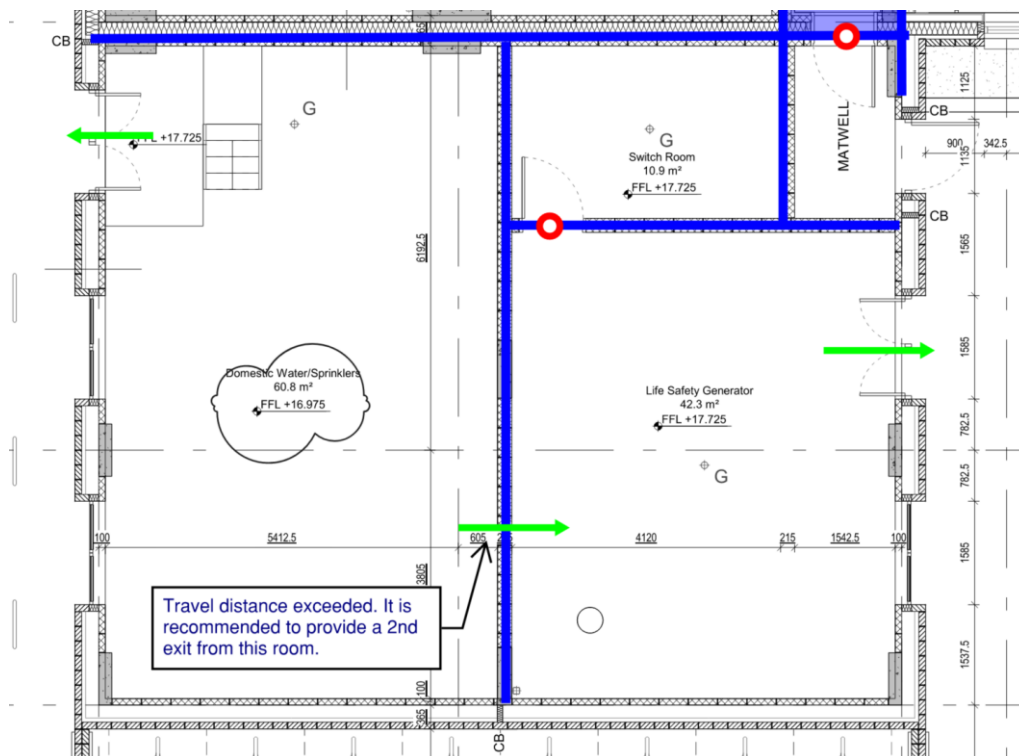


Figure 14: Block D3 Ground Floor Domestic Water/Sprinklers

3.4.5 Exit Widths

The clear width of each stair should be no less than 750mm (unobstructed), this width should be kept clear for a vertical distance of 2m. The clear width is measured between the walls and/or the balustrade. Exit routes from stairs and final exits should be of no less width than the stairs themselves.

Door clear widths along escape routes should be no less than 750mm from a fire safety point of view.

It is recommended that the minimum width of each corridor is no less than 1200mm.

3.5 Persons of Restricted Mobility

3.5.1 Overview

Under current guidance, the provision of evacuation lifts is not considered required. However, in accordance with **Clause 6.2 Catalyst ER** and the upcoming changes to BS 9991 and overall emphasis by the industry on dignified egress for occupants with reduced mobility, an evacuation lift should be provided for each stair core.

3.5.2 Evacuation Lifts

The lifts should be designed in accordance with BS EN 81-20 (4).

Evacuation lifts as well as the lighting within the cabins and the preceding protected lobbies should consist of a primary and a secondary power supply.

Adequate signage should be provided to indicate the location and intended use of the evacuation lifts.

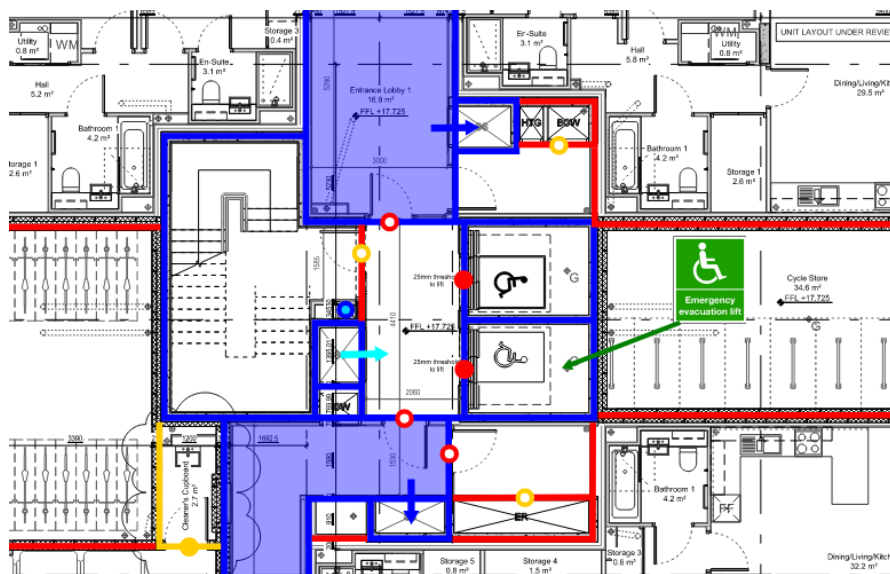


Figure 15: Evacuation Lift | Block D3

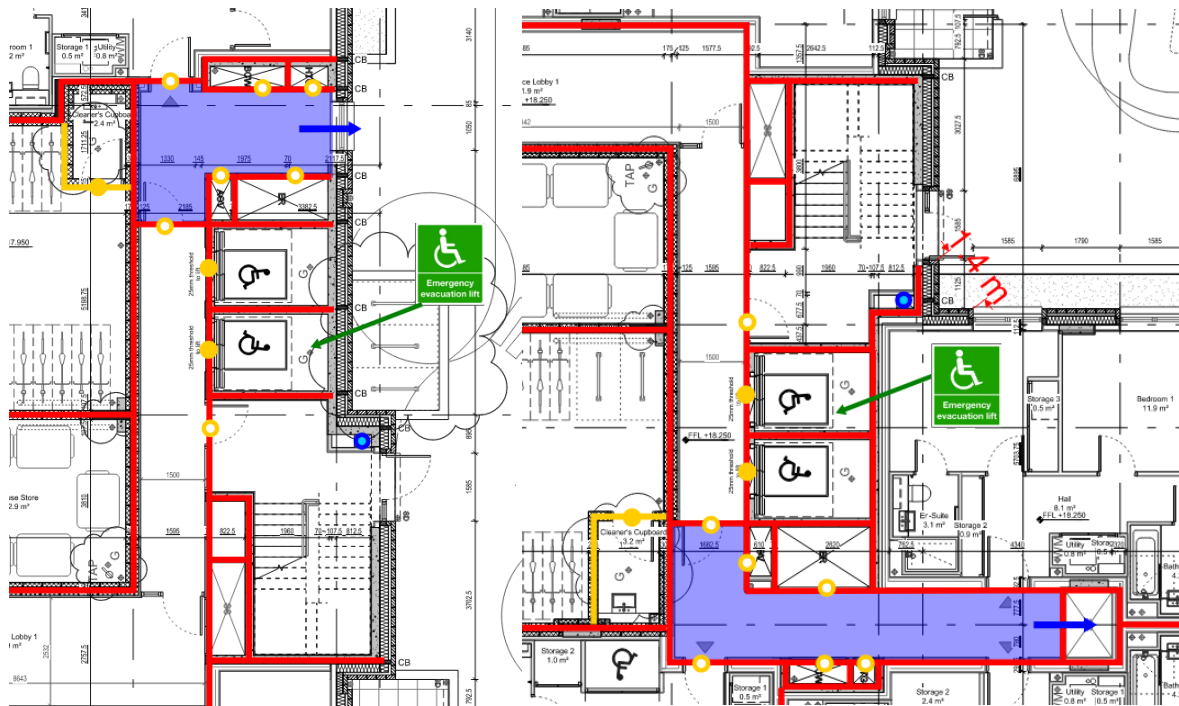


Figure 16: Evacuation Lift | Core D1 and D2

3.5.3 Refuges

It should be noted that refuges within stairwells are not provided under the basis that these blocks are provided with evacuation lifts and dedicated lift lobbies which constitute a place of relative safety.

Note: To fully meet Catalyst ER, an additional place of relative safety is to be provided in the stairwells.

Due to the fact that evacuation lifts are provided in every level of each core, the provision of Personal Emergency Evacuation Plans (PEEP) is not required, however recommended. Occupants who require the use of the evacuation lift need to be trained in the operation of said lift so to make use of it without assistance.

3.6 Inner Rooms

The design incorporates 3 inner rooms on ground floor level in each block:

- 3 x Cleaner's Cupboard.

These rooms with approximately 4 m² are not provided with any provisions for a long term stay. As per guidance BS 9991, these cleaner cupboards are not considered habitable rooms. Therefore, it is not expected for persons to be in said rooms for a period of time in which a fire in the access room could develop to not allow for egress out of the access room.

3.7 Means of Egress Elements

3.7.1 Door Opening Direction

No requirements are given in guidance regarding the door opening direction within egress routes in residential areas.

The common areas on Ground Floor are not expected to have an occupant count of more than 60 at any given time. Therefore, doors within egress routes from these spaces do not need to open in direction of escape.

3.7.2 Security and Panic Hardware

So as to permit safe egress under all circumstances all doors upon the egress route must be openable in the direction of egress without the evacuees requiring:

- A key, pass, fob or similar device.
- Specialist knowledge, such as a pass code.

Electronically powered locks must be returned to the unlocked position under any of the following circumstances:

- Power failure.
- Activation of a manual door release unit (Type A) designed and installed in accordance with BS EN 54-11 (5) located on the side of the door approached during egress from the building.

The buildings are not provided with a common alarm system; therefore, the electronically powered locks are not to go in unlocked positions upon fire alarm activation within the units.

According to BS 9991 and **Clause 3.5 Catalyst ER** it is deemed reasonable to provide escape doors with push to exit or emergency door release systems.

3.7.3 Hold Open Devices

Electromagnetic devices are used either to hold a fire door in the open position, against the action of the door closer or to allow it to swing freely, automatically releasing the closing mechanism in a fire situation. The electromagnetic release mechanism should allow the door closing device to resume its self-closing function in the event of one or more of the following:

- The detection of heat or smoke by any in built sensing device.
- Failure of any power supply in the building.
- Local manual operation.

Such doors closing devices should be set to close after no longer than 25s and should be installed in accordance with BS 7273-4 (6). The electromagnetic hold open devices should not be used on any door serving escape stairs.

3.7.4 Vision Panels

Vision panels should be provided within all doors sub-dividing corridors. Vision panels should be designed to comply with the guidance of Approved Document M (7) and Approved Document K.

3.7.5 Emergency Lighting

Emergency lighting should be provided within the ancillary accommodations and the stairways. The emergency lighting should be in accordance with BS 5266-1 (8).

3.7.6 Escape Signage

Fire EXIT signage should be provided in accordance with BS ISO 3864-1 (9) and BS 5499-4 (10) in at minimum the following locations:

- Above or adjacent to every storey exit (other than those in normal usage).
- To clearly indicate the direction to the nearest storey exit from any location where it is not possible to identify the location or direction to the nearest storey exit.

EXIT signage should be provided in accordance with the guidance of the HSE publication Safety Signs and Signals: Guidance on Regulations.

The entrance from the roof top into the protected corridor requires signage as well.

Since in both buildings a 'stay put' strategy should be implemented (exemption communal areas ground floor) emergency lighting with self-contained luminaire according to **Clause 5.1 Catalyst ER** should be provided to:

- Common escape routes,
- Identified slips, trip or fall hazards,
- Call points (where installed),
- Firefighting equipment for windowless plant areas and maintenance areas and
- Guarantee safe movement in parts of the premises when the occupants need not evacuate the premises immediately.

3.8 Smoke Control

3.8.1 Block D1 & 2

The common corridors are to be fitted with a smoke shaft (natural ventilation) in accordance with Clause 14.2.3 BS 9991 (11).

- The cross-sectional area (free area) of the smoke shaft should be no less than 1.5m² and the minimum dimension should be 0.85m in any direction.
- The corridor vents, the opening at the head of the shafts as well as all internal locations should have a free area of at least 1.0m².
- The corridor vents should be located as close to the ceiling of the respective corridor as possible. The smoke shaft must be located as far away from the entrance to the stairwell or lift lobby as possible.
- In Block D2 a common corridor connects directly to the outer wall. An AOV (window) with the minimum dimensions mentioned above may be used instead of a smoke shaft.
- Additionally, an AOV is sited at the head of the stairway with no less than 1.0m² free area.
- The system should be designed in a such way, that only the vent of the fire floor as well as on top of the stairs open simultaneously and all other vents should remain closed according to Clause 14.2.2.4 BS 9991 (11).

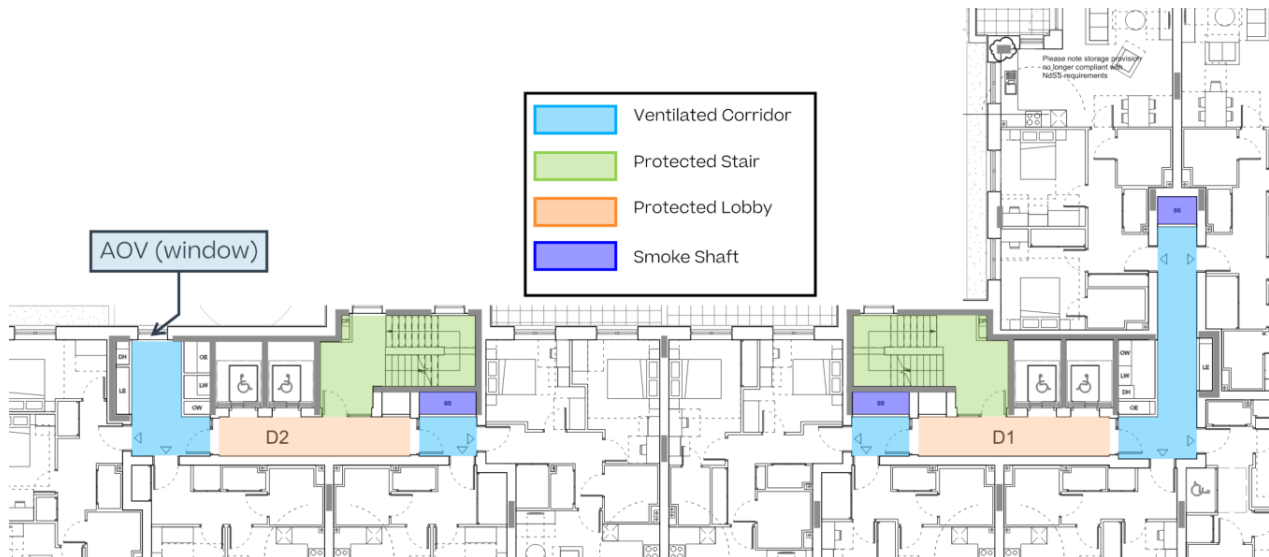


Figure 17: Smoke Control Common Corridors Block D1 & 2

Note: Presently the corridors in D2 are afforded an AOV window for smoke control. This is in line with guidance BS 9991. However, Catalyst ER Section 7.1 requires for buildings <18 m to introduce a 2nd AOV window. Given the current layout, the introduction of a 2nd AOV window is not possible, as the corridor is afforded access to a single external wall (i.e. window) only. This is to be confirmed with the client.

3.8.2 Block D3

The common corridors in all blocks are to be fitted with a mechanical smoke ventilation system in accordance with Clause 14.2.4 BS 9991 (11).

- Two fans should be provided as a minimum requirement. The standby fan should be activated automatically in case the duty fan fails to operate. Both fans as well as the actuators are to be provided with a secondary power supply.
- Additionally, an AOV with a minimum free area of 1.0 m² is to be located at the head of each stair.
- The vents in the common corridors discharge into a smoke shaft. The system should be designed in a such way, that only the vent of the fire floor as well as on top of the stairs open simultaneously and all other vents should remain closed.
- Smoke shaft should have a cross-sectional free area of not less than 0.6m.
- The mechanical ventilation system should limit pressure differentials so that the door opening forces do not exceed 100N at the door handle when the system is in operation.
- No services other than those relating to the smoke shaft should be contained within the smoke shaft.
- The volumetric extract rate as well as the criteria listed above are to be determined via computational fluid dynamic simulation (CFD). This will be part of a separate report.

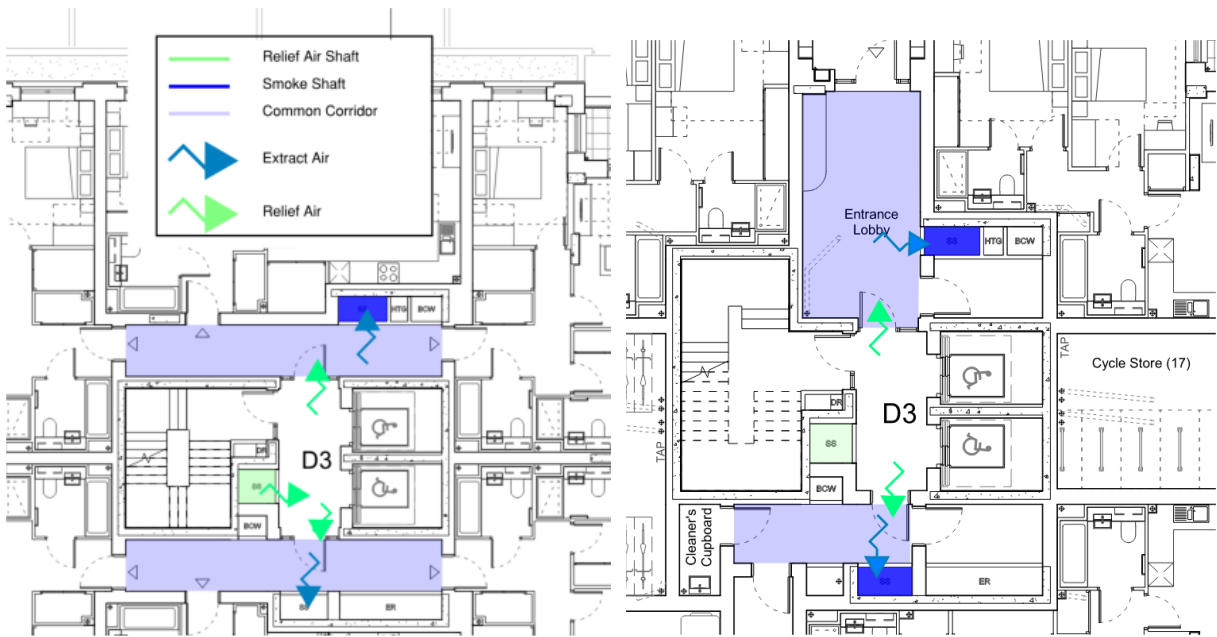


Figure 18: Smoke Control Common Corridors Block D3 | Typical Floor (left) and Ground Floor (right)

4 B2 INTERNAL FIRE SPREAD (LININGS)

4.1 Surface Spread of Flames

4.1.1 General Linings

The surface linings of walls and ceilings are to be designed to meet the following limitations:

Table 7: Performance requirement for internal linings

Location	Minimum Classification
All other rooms <4m ² within the dwelling	D-s3,d2
Stairs and hallways within the dwelling	C-s3,d2
All other rooms within the dwelling ^A	
All common spaces including stairs	B-s3,d2

Note A: Up to ½ (but no greater than 20m² total) of an individual rooms internal surface may be reduced to a D-s3,d2 classification.

4.1.2 Stairs

Under the following assessment the flights and landing of the stairs in Block D1 & 2 and D3 should be constructed to achieve no less than a Class A2-s3,d2 reaction to fire classification:

- The stair is the only stair serving the building.

In addition, where a stair is provided as a firefighting stair (Block D3), any textile floor covering should achieve the following:

- When tested in accordance with BS 4790 (12) (together with any underlay) achieve either:
 - No ignition or
 - Have a radius of ignition of no greater than 35mm.
- Securely affixed to the stairs via a non-water-soluble mechanism.
- Be interrupted at the door threshold via a non-combustible strip of no less than 50 mm in width or the width of the door leaf, whichever is wider.

4.2 Thermoplastic Material

4.2.1 Rooflights and Lighting Diffusers

Thermoplastics may be used in rooflights and lighting diffused providing that the following limits are met:

Table 8: Limitations on the use of thermoplastic rooflights and diffusers

Classification of the Lower Surface	Location ^A	Maximum Area of Each Element (m ²)	Maximum Aggregate Area (m ²)	Minimum Separation between each Element (m)
TP(a)	Any	-	-	-
TP(b) or D-s3,d2	Rooms	1	50	Equal to the largest plan dimension of the largest element
		5	50	3
	Circulation Spaces	5	15	3

Note A: Thermoplastic rooflights and diffusers may not be located within protected stairs.

5 B3 INTERNAL FIRE SPREAD (STRUCTURE)

5.1 General

The fire resistance levels in the following sections are specified in terms of R/E/I, where R, E and I correspond to the following and are measured in minutes:

R - Loadbearing Capacity;

E - Integrity and

I - Insulation.

Fire resistance requirements will need to satisfy either BS 476 Part 22 (13) or the relevant European Standard (i.e. BS EN 1364 (14), 1365 (15) or 1366 (16)).

5.2 Fire Resistance

5.2.1 Separated Parts of the Building

Block D1 & 2 and Block D3 require compartmentation between flats as well as between flats and adjacent units. On ground floor level ancillary accommodation is to be separated via fire resisting construction. Blocks D1 and D2 need to be separated via a compartment wall as indicated below:

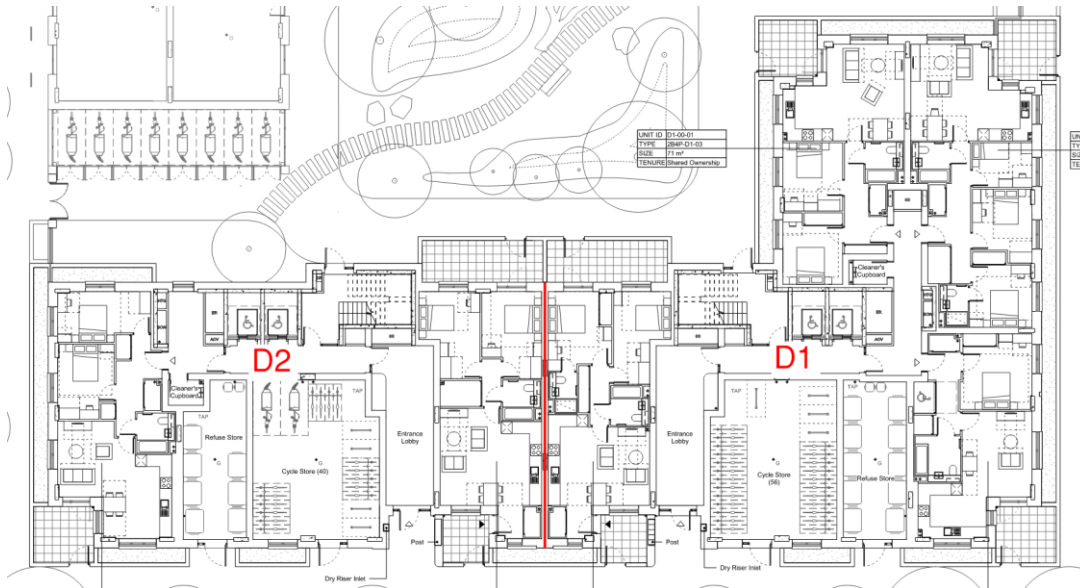


Figure 19: Compartment Wall between Block D1 and D2

5.2.2 Structural Fire Resistance

Except where noted below all loadbearing elements of structure are to be designed to achieve the standard of performance noted in **Table 9**:

- Elements of structure which support only the roof, and do not otherwise provide overall lateral stability to the building may be provided without any fire resistance.

Table 9: Minimum standard of structural fire resistance

Part of the Building	Building Height (m)	Minimum Structural Fire Resistance
D1 & 2	16.0 m	60/-/-
D3	25.5	90/-/-

5.2.3 Fire Resisting Construction and Closures

Fire resistance levels will satisfy the requirements of BS 9991 (11). Key elements are specified in **Table 10** below.

Table 10: Minimum Periods of Fire Resistance Block D1& 2

Location	Minimum Periods of Fire Resistance (mins)	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS 476-22	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS EN 1634 Parts 1 and 3	Type of Exposure
Structural Frame, Load Bearing Walls, Beams or Columns	60/-/-	N/A	N/A	Exposed faces
Floors	60/60/60	N/A	N/A	From underside
Service Shafts	-/60/60	FD30 S	E30 Sa	Each side separately
Non-firefighting stairs	60/60/60	N/A	N/A	From underside
Protected Stair Enclosure	60/60/60	FD30 S	E30 Sa	Each side separately
Lift Enclosure	60/60/60	FD30	E30	Each side separately
Walls separating Flats from Common Areas	60/60/60	FD30 S	E30 Sa	Each side separately
Walls separating Flats from Adjacent Residencies	60/60/60	N/A	N/A	Each side separately
Cycle Store, Cleaners Cupboard	60/60/60	FD30 S	E30 Sa	Each side separately

Location	Minimum Periods of Fire Resistance (mins)	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS 476-22	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS EN 1634 Parts 1 and 3	Type of Exposure
Refuse Store	60/60/60	FD60 S	E60 Sa	Each side separately

Table 11: Minimum Periods of Fire Resistance Block D3

Location	Minimum Periods of Fire Resistance (mins)	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS 476-22	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS EN 1634 Parts 1 and 3	Type of Exposure
Structural Frame, Load Bearing Walls, Beams or Columns	90/-/-	N/A	N/A	Exposed faces
Floors	90/90/90	N/A	N/A	From underside
Service Shafts	-/90/90	FD30 S	E30 Sa	Each side separately
Firefighting Shaft (walls enclosing the stairs, lifts and lift lobby)	120/120/120	FD60 S	E60 Sa	From side remote from shaft
Evacuation Lift Enclosure	60/60/60	FD30	E30	Each side separately
Walls separating Flats from Common Areas	60/60/60	FD60	E60	Each side separately
Walls separating Flats from Adjacent Residencies	60/60/60	N/A	N/A	Each side separately
Cycle Stores, Cleaners Cupboard	60/60/60	FD30 S	E30 Sa	Each side separately

Location	Minimum Periods of Fire Resistance (mins)	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS 476-22	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS EN 1634 Parts 1 and 3	Type of Exposure
Life Safety Generator, Switchroom, Domestic Water/Sprinklers (containing life safety equipment)	120/120/120	FD60 S	E60 Sa	Each side separately
Refuse Store	60/60/60	FD60 S	E60 Sa	Each side separately

5.2.4 Inner Angles at Final Exits

The stairs of Block D1 discharge on ground floor level directly to the outside. The escape stair needs to be sufficiently protected against heat and smoke.

As 1 side of the external wall faces the final exit in a 90 degree angle, the external wall needs to be protected for a length of minimum 1.8m with fire rated construction. An apartment window is located adjacent to the stairwell. The distance to the final exit from the stairwell is 1.4m. This is acceptable because:

- The building is afforded a 'stay put' evacuation strategy. In the event of a fire in the apartment on ground floor level, occupants of the upper levels do not necessarily need to evacuate immediately.
- The apartment is location on Ground Floor, therefore, any fire in that apartment can be tackled by attending firefighters from the outside (and through the protected corridor) from different sides of the building.
- The stairwell is connected to the entrance lobby with a direct exit to the outside. Occupants can use this route to exit the building, if necessary.
- The apartment is sprinklered, therefore it is reasonably expected for a fire to be suppressed and prevented from rapid growth and spread.

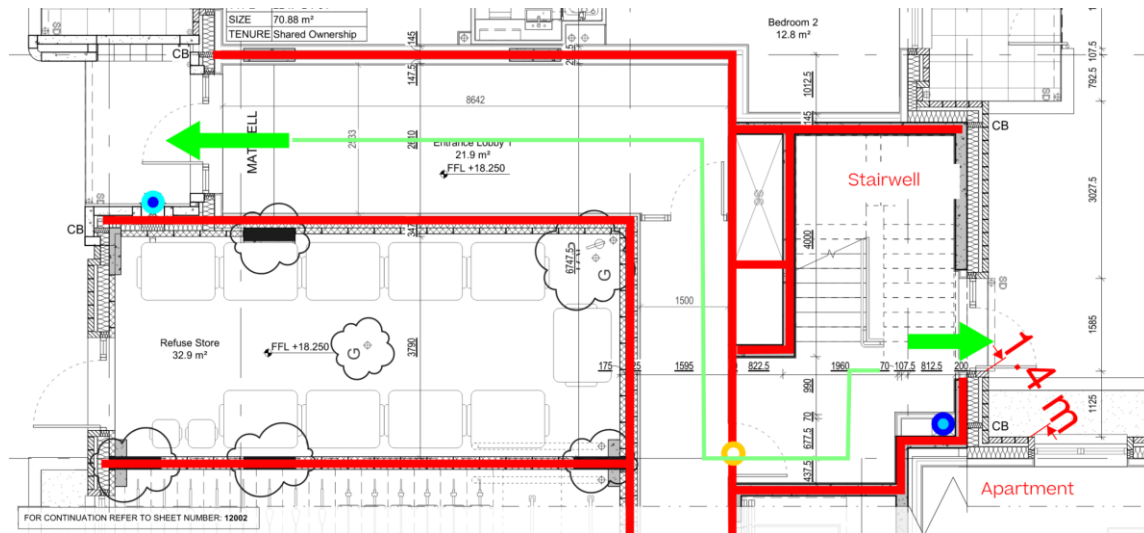


Figure 20: Inner Angle Stairwell Block D1

5.3 Continuity of Construction

5.3.1 General Provisions

All compartment walls and compartment floors should achieve both of the following:

- Form a complete barrier to fire between the compartments they separate.
- Have the appropriate fire resistance, as given in **Table 10** and **Table 11** above.

5.3.2 Compartment Walls

A compartment wall is provided between Block D1 and D2. Compartment walls common to two or more buildings must comply with both of the following.

- Run the full height of the building in a continuous vertical plane (compartment walls between buildings or separated parts of the building) or storey in which they are situated (other compartment walls)
- Be continued through any roof space to the underside of the roof.

5.4 Services and Penetrations

5.4.1 Protected Shafts

The construction enclosing a protected shaft should do both of the following.

- Form a complete barrier to fire between the compartments connected by the shaft.
- Have the appropriate fire resistance, except for uninsulated glazed screens.

5.4.2 Flues

The wall of a flue, duct containing flues or appliance ventilation duct(s) should have a fire resistance (REI) that is at least half of any compartment wall or compartment floor it passes through or is built into.

5.4.3 Pipes

Pipes passing through a fire-separating element, unless in a protected shaft, should meet one of the following recommendations:

Proprietary Seals (Any Pipe Diameter)

Provide a proprietary sealing system that will maintain the fire resistance of the wall, floor or cavity barrier tested and installed in accordance with BS EN 1366-3 (17).

Pipes with a Restricted Diameter

Where a proprietary sealing system is not used, firestop around the pipe, keeping the opening for the pipe as small as possible. The nominal internal diameter of the pipe should not exceed the dimensions outlined in **Table 12**.

Table 12: Maximum Nominal Internal Diameter of Pipes passing through a Compartment Wall / Floor

Situation	Pipe material and maximum nominal internal diameter (mm)		
	(a) High melting point metal ⁽¹⁾	(b) Lead, aluminium, aluminium alloy, uPVC, ⁽²⁾ fibre cement	(c) Any other material
Structure (but not a wall separating buildings) enclosing a protected shaft that is not a stair or a lift shaft	160	110	40
Compartment wall or compartment floor between flats	160	160 (stack pipe) ⁽³⁾ 110 (branch pipe) ⁽³⁾	40
Any other situation	160	40	40

Note 1: Any metal (such as cast iron, copper or steel) which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.

Note 2: uPVC pipes that comply with either BS 4514 or BS 5255.

Note 3: These diameters are only in relation to pipes that form part of an above-ground drainage system.

Sleeving

A pipe with a maximum nominal internal diameter of 160mm may be used with a sleeve made out of a high melting point metal, if the pipe is made of one of the following.

- Lead.
- Aluminium.
- Aluminium alloy.
- Fibre-cement.
- uPVC (pipes should also comply with either BS 4514 or BS 5255).

A high melting point metal means any metal (such as cast iron, copper or steel) which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.

5.4.4 Ducts

General Provisions

If air handling ducts pass through fire-separating elements, the load-bearing capacity, integrity and insulation of the elements should be maintained using one or more of the following four methods.

1. Thermally activated fire dampers.
2. Fire resisting enclosures.
3. Protection using fire resisting ductwork.
4. Automatically activated fire and smoke dampers triggered by smoke detectors.

Kitchen Extract

Methods 1 and 4 should not be used for extract ductwork serving kitchens. The likely build-up of grease within the duct can adversely affect dampers.

Ducts passing through Protected Escape Routes

Method 1 should not be used for extract ductwork passing through the enclosures of protected escape routes.

Installation and Specification of Fire Dampers

Both fire dampers and fire and smoke dampers should be all of the following.

- Sited within the thickness of the fire-separating elements.
- Securely fixed.
- Sited such that, in a fire, expansion of the ductwork would not push the fire damper through the structure.

Access to the fire damper and its actuating mechanism should be provided for inspection, testing and maintenance.

Fire dampers should meet both of the following conditions.

- Conform to BS EN 15650 (18).
- Have a minimum E classification of 60 minutes or to match the integrity rating of the fire resisting elements, whichever is higher.

Fire and smoke dampers should meet both of the following conditions.

- Conform to BS EN 15650 (18).
- Have a minimum ES classification of 60 minutes or to match the integrity rating of the fire resisting elements, whichever is higher.

Smoke detectors should be sited so as to prevent the spread of smoke as early as practicable by activating the fire and smoke dampers. Smoke detectors and automatic release mechanisms used to activate fire dampers and/or fire and smoke dampers should conform to BS EN 54-7 (19) and BS 5839-3 (15) respectively.

5.4.5 Fire Stopping

In addition to any other provisions for fire stopping, both of the following conditions should be met.

- Joints between fire-separating elements should be fire-stopped.
- Openings through a fire resisting element for pipes, ducts, conduits or cable should be all of the following.
 - As few as possible.

- As small as practicable.
- Fire-stopped (allowing thermal movement in the case of a pipe or duct).

Materials used for fire-stopping should be reinforced with (or supported by) materials rated class A2-s3, d2 or better to prevent displacement in both of the following cases.

- Where the unsupported span is greater than 100mm.
- Where non-rigid materials are used (unless subjected to appropriate fire resistance testing to show their suitability).

Other fire-stopping materials, subject to the type of application, include the following:

- Cement mortar.
- Gypsum-based plaster.
- Cement-based or gypsum-based vermiculite/perlite mixes.
- Glass fibre, crushed rock, blast furnace slag or ceramic-based products (with or without resin binders).
- Intumescent mastics.

5.5 Cavities

5.5.1 Locations

Cavity barriers are to be provided in the following locations within an external cavity wall:

- Around all openings through the cavity wall, including but not limited to:
 - Doors.
 - Windows.
 - Vents.
 - Pipes.
- At the junction of every fire rated wall and the external cavity wall, including but not limited to:
 - Party walls between units.
 - Walls forming protected hallways.
 - Walls forming enclosure of stairwells.
- At the junction between the floor slab and the external cavity wall.
- So as to sub-divide extensive cavities within the external wall such that:
 - The maximum dimension within the cavity is 20m, where all materials (other than pipes, cables or conduits) achieve no less than a C-s3,d2 reaction to fire classification.
 - The maximum dimension within the cavity is 10m, where all materials (other than pipes, cables or conduits) achieve less than a C-s3,d2 reaction to fire classification.

5.5.2 Performance Requirements

Except where noted below all cavity barriers are to achieve no less than -/30/15 (REI) in accordance with BS 476-20 (20).

The following materials are also deemed to meet the performance requirements of a cavity barrier around openings without testing in line with the guidance of Clause 19.2 BS 9991 (11):

Table 13: Deemed to comply materials

Steel of no less than 0.5mm thick.
Timber no less than 38mm thick.
Polythene-sleeved mineral wool installed in compression within the cavity. Good practice would dictate that this should be compressed no less than 10mm when fitted.
Calcium silicate, cement-based or gypsum boards, no less than 12mm thick.

5.5.3 Masonry Cavity Walls

Where the inner and outer leaf of external wall are constructed of masonry (brickwork, blockwork or concrete) for with a minimum thickness of 75mm, the following is deemed acceptable in line with the guidance of BS 9991 (11):

- Cavity barriers and cavity closers around openings can be excluded.
- The cavity is to be closed at the top of the wall. This material does not need to achieve a specific performance in relation to fire resistance.

Closing the cavity at the top can be omitted where the cavity is fully filled with insulation.

- Materials achieving class B-s3, d2 or worse may be placed within the cavity (this does not apply to buildings that fall under Regulation 7(2))
- Cavity barriers should be provided to separate this specific wall type from other external wall types.

5.5.4 Fixing and Installation

All cavity barriers are to be designed, fixed and installed with the product certification and manufacturer's instructions.

Deemed to comply materials (see **Table 13** above) must be fixed such that the cavity barrier is not rendered ineffective by any of the following:

- Natural movement of the building from subsidence, shrinkage, temperature change or wind pressures.
- Failure of the supporting system or fixings during fire.
- Failure of materials against which the cavity barrier may abut.

It is specifically noted that cavity barrier materials when installed in combination with Steel Framing Systems (SFS) have not usually been tested in this configuration (due to the nature of the BS 476 tests, which places the barrier material between two leaves of concrete or block). Where utilising certified cavity barrier systems in combination with SFS or similar wall systems the following alternative approach is to be adopted:

- The inner plaster line to the wall system should be demonstrated as achieving no less than a 30/30/30 (REI) fire resistance rating (from the inside only) where installed in combination with the SFS wall system.

This is such that there can be confidence that the SFS framing will maintain its structural stability where installed as a complete wall system for a duration equivalent to that of the cavity barrier which it may be supporting.

- Where there is an opening through the wall system the following should be afforded to protect the SFS so far as is reasonably practicable. To this end:
 - The wall system must be provided with a sheathing board provided on the 'outside' of the metsec system. The sheathing board should be formed of Calcium silicate, cement-based or gypsum boards, no less than 12mm thick.
 - The plaster line must be fully returned to the sheathing board and form a continuous junction with the sheathing board. The junction should be sealed with a fire rated mastic or similar suitable product for closing small gaps.
 - Fixings associated with the opening (such as window frame fixings) must be provided such that they do not break the continuity of the plasterboard/sheathing board enclosure.

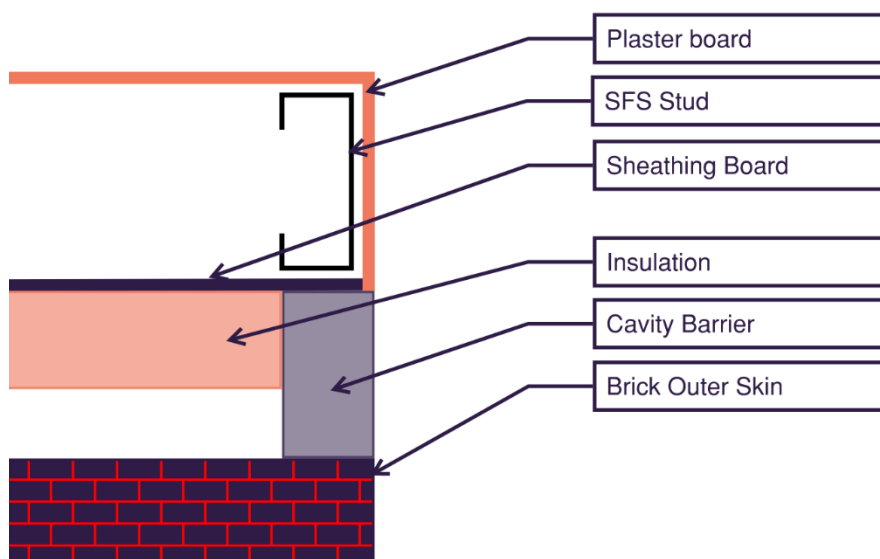


Figure 21: Schematic Plan Opening in SFS Cavity Wall

This arrangement is considered to meet the intent of the guidance of BS 9991, and hence the requirements of the Building Regulations B3.(4) (21) under the following assessment:

- The cavity is affixed between SFS and brick construction in line with manufacturers requirements. It is reasonably expected that installation in this manner shall be sufficient to ensure the cavity barrier shall remain effective despite the natural movement of the building (this should be confirmed however with the cavity barrier manufacturer). Therefore the 1st intent of BS 9991 should be met by this arrangement.
- Where a cavity barrier is not affixed around an opening (i.e. at compartment walls) the provision of continuous inner line of plaster boarding sufficient for the SFS system to achieve a 30/30/30 (REI) fire resistance (from inside only) will have been demonstrated to retain the structural stability of the SFS wall system for a duration of no less than 30min under standard test conditions. It is therefore considered that the cavity barrier is supported by a material which achieves no less performance than the cavity barrier itself. Therefore, under fire condition the cavity barrier will not have its standard of performance reduced by the failure of the supporting system. Therefore, under this configuration, both the 2nd and 3rd intent of BS 9991 (11) should be met by this arrangement.

- Where a cavity barrier is affixed around an opening the detail above is provided to achieve the following intents:
 - The SFS system is protected internally by the plasterboard continuously into the reveal of the opening so as to protect the SFS system from heat internal to the apartment right into the reveal itself.
 - A continuous barrier with the sheathing board is formed to totally 'encapsulate' the SFS structural elements such that there are no point of weakness or small openings within the reveal which may allow for excessive heating of the SFS elements, which could result in deflection of the structural element resulting in the cavity barrier not performing as intended.
 - The sheathing board is formed of materials which are otherwise deemed to achieve the performance of a cavity barrier without testing, and may be reasonably expected to maintain integrity for an adequate period of time to limit heat ingress into the SFS from 'within' the cavity.
 - The sheathing board is also provided in combination with the cavity barrier itself in this location significantly impeding the possible movement of heat into the internal portion of the cavity wall.

In combination these elements should be reasonably expected to maintain the structural fire resistance of the SFS element, such that the cavity barrier is supported by a material which achieves no less performance than the cavity barrier itself. Therefore, under fire condition the cavity barrier will not have its standard of performance reduced by the failure of the supporting system. Therefore, under this configuration, both the 2nd and 3rd intent of BS 9991 (11) should be met by this arrangement.

6 B4 EXTERNAL FIRE SPREAD

6.1 Fire Spread to Boundary

It has been assessed that all boundaries are sited at a distance of at least 1 m away from Block D. Block D is further sited in such a way, that no relevant boundaries need to be taken into account when assessing the external fire spread exempt for the southern elevation. Block D is flanked by adjacent blocks of St Ann's New Neighbourhood on the other three elevations.

The external fire spread assessment has been undertaken using the approach specified in BR 187 (22). The largest or most onerous compartment on each elevation has been reviewed and an assessment of the most onerous arrangement has been undertaken.

A number of assumptions are made when assessing the risk of external fire spread as follows:

- A fire does not spread beyond the unit of origin hence only 1 u needs to be assessed at the same time.
- The compartment of fire origin has reached flashover.
- All unprotected areas of one compartment will be radiating with equal intensity.
- The fire growth rate for residential units is assumed to be medium whereas in the ancillary units it is assumed to be fast.

6.1.1 Boundary Conditions Block D1 & 2

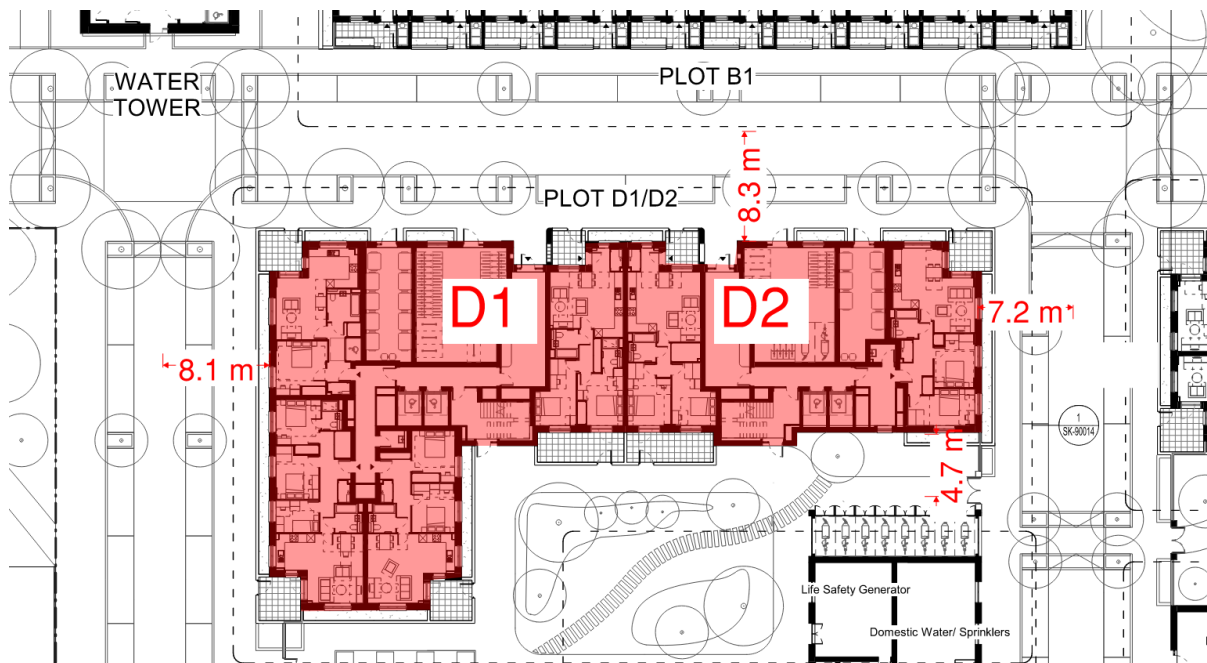


Figure 22: Boundary and Notional Boundary Distance Assessment Block D1 & 2

6.1.2 Fire Resistance of External Wall Block D1 & 2

Table 14 below summaries the results of the external fire spread assessment in accordance with the methodologies of BRE 187 (22):

Table 14: External Fire Spread Block D1 & 2

Building	Elevation/ Emitting Unit	Receiving Boundary	Width (m)	Height (m)	Distance to boundary (m)	Maximum unprotecte d Area %	Allowable unprotected Area (m ²)
Block D1& 2	West/Cycl e Store	B1	7.0	3.4	8.3	100	23.8
	East/Resid ential Unit	D3	5.1	3.4	4.7	100%	17.3
	North/Resi dential Unit	C1	13.4	3.4	7.2	100%	45.6
	South/Resi dential Unit	West Boundary	15.3	3.4	8.1	100%	52

6.1.3 Boundary Conditions Block D3

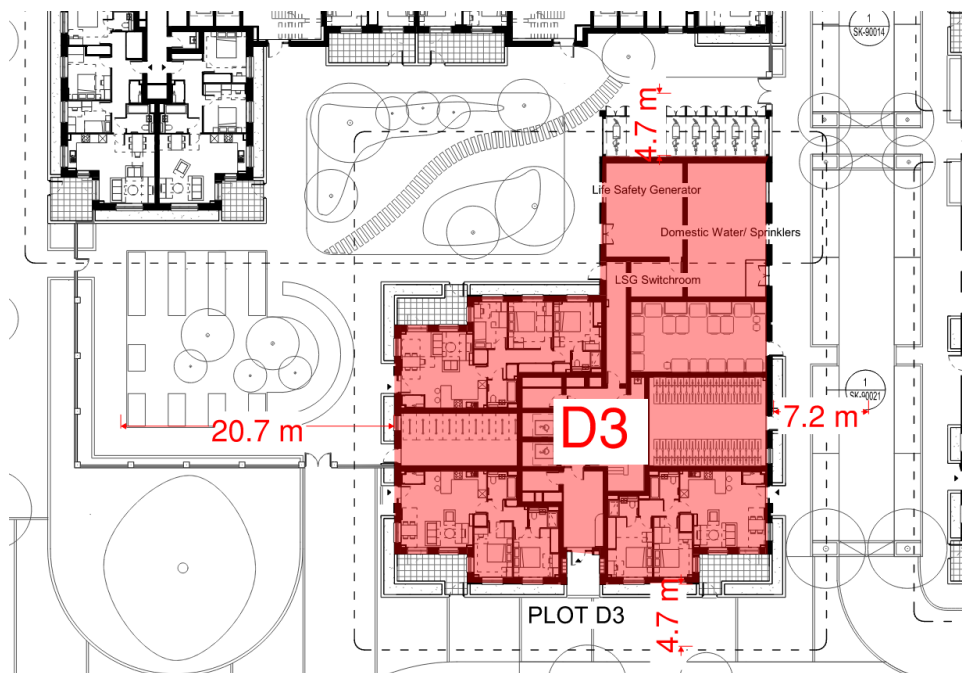


Figure 23: Boundary and Notional Boundary Distance Assessment Block D3

6.1.4 Fire Resistance of External Wall Block D1 & 2

Table 15 below summaries the results of the external fire spread assessment in accordance with the methodologies of BRE 187 (22):

Table 15: External Fire Spread Block D3

Building	Elevation/E mitting Unit	Receiving Boundary	Width (m)	Height (m)	Distance to boundary (m)	Maximum unprotected Area %	Allowable unprotected Area (m ²)
Block D3	West/Life Safety Generator	B1	5.8	3.4	4.7	100	19.8
	East/Reside ntial Unit	D3	12.2	3.4	4.7	100%	41.5
	North/Cycle Store	C1	6.7	3.4	7.2	100%	22.8
	South/Cycle Store	West Boundary	4.0	3.4	20.7	100%	13.6

6.1.5 Roof Coverings

Roof coverings will achieve the classifications in the following table depending on their distance from the relevant boundary.

Table 16: Classification of Roof Coverings

Distance of Roof (or Part of Roof) to Relevant Boundary (m)	Designation of Roof Covering				
	B _{Roof} (t4)	C _{Roof} (t4)	D _{Roof} (t4)	E _{Roof} (t4)	F _{Roof} (t4)
<6m	●	○	○	○	○
>6m but <12m	●	●	●	●	○
>12m but <20m	●	●	●	●	○
>20m	●	●	●	●	●

Key:

● Acceptable ○ Not Acceptable

Notes:

1. Separation distances do not apply to enclosed/covered walkways.

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

To reduce the risk of fire spreading over the roof from one compartment to another, a 1500mm wide zone of the roof, either side of the wall, will have a covering classified as BROOF(t4), on a substrate or deck of a material rated class A2-s3, d2 or better, as set out in the figure below.

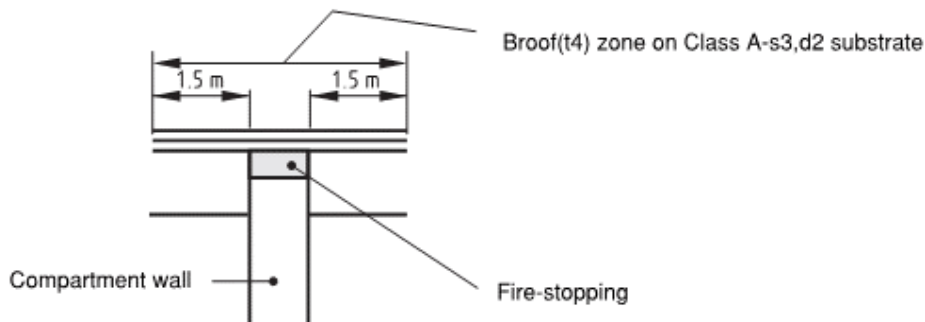


Figure 24: Junction of a Compartment Wall with the Roof

6.2 External Fire Spread

6.2.1 Surface Spread of Flames

The external walls from Ground Floor Level to the mean roof level are >18m and therefore the surface spread of flame for each block is highlighted below in **Table 16**.

Table 17: Surface Spread of Flame Classification

Building Reference	Building Height to Mean Roof Level (m)	Surface spread of flame or Reaction to fire classification
Block D1 & 2	> 18m but < 30m	Class A2-s1, d0 or Class A1
Block D3	> 18m but < 30m	Class A2-s1, d0 or Class A1

Note: In line with Section 10 Catalyst ER, at least Class A2-s3,d2 is to be achieved, regardless of height.

6.2.2 External Wall Materials

The 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 Reaction to Fire Classification of A2-s1, d0 or A1, classified in accordance with BS EN 13501-1 (23) for both buildings.

It is noted that Regulation 7 now specifies that 'specified attachments' now also require classification where Regulation 7 is applicable.

A 'Specified attachment' is a:

- A balcony attached to an external wall;

Table 18: Combustibility of Insulation Materials

Building Reference	Building Height to the Topmost Habitable Storey (m)	Combustibility or Reaction to Fire classification of External Wall Materials (European Class)
Block D1 & 2	> 11m but < 18m	Class A2-s1, d0 or Class A1
Block D3	> 18m but < 30m	Class A2-s1, d0 or Class A1

Membranes are to achieve a minimum Class B-S3, d0.

Note: In line with Section 10 Catalyst ER, at least Class A2-s3,d2 is to be achieved, regardless of height.

7 B5 ACCESS AND FACILITIES FOR THE FIRE SERVICE

7.1 Vehicle Access

7.1.1 Access Requirement

The buildings are provided with rising mains, as such roadway access to within 18m of all mains inlet is to be provided as demonstrated in **Figure 25**:

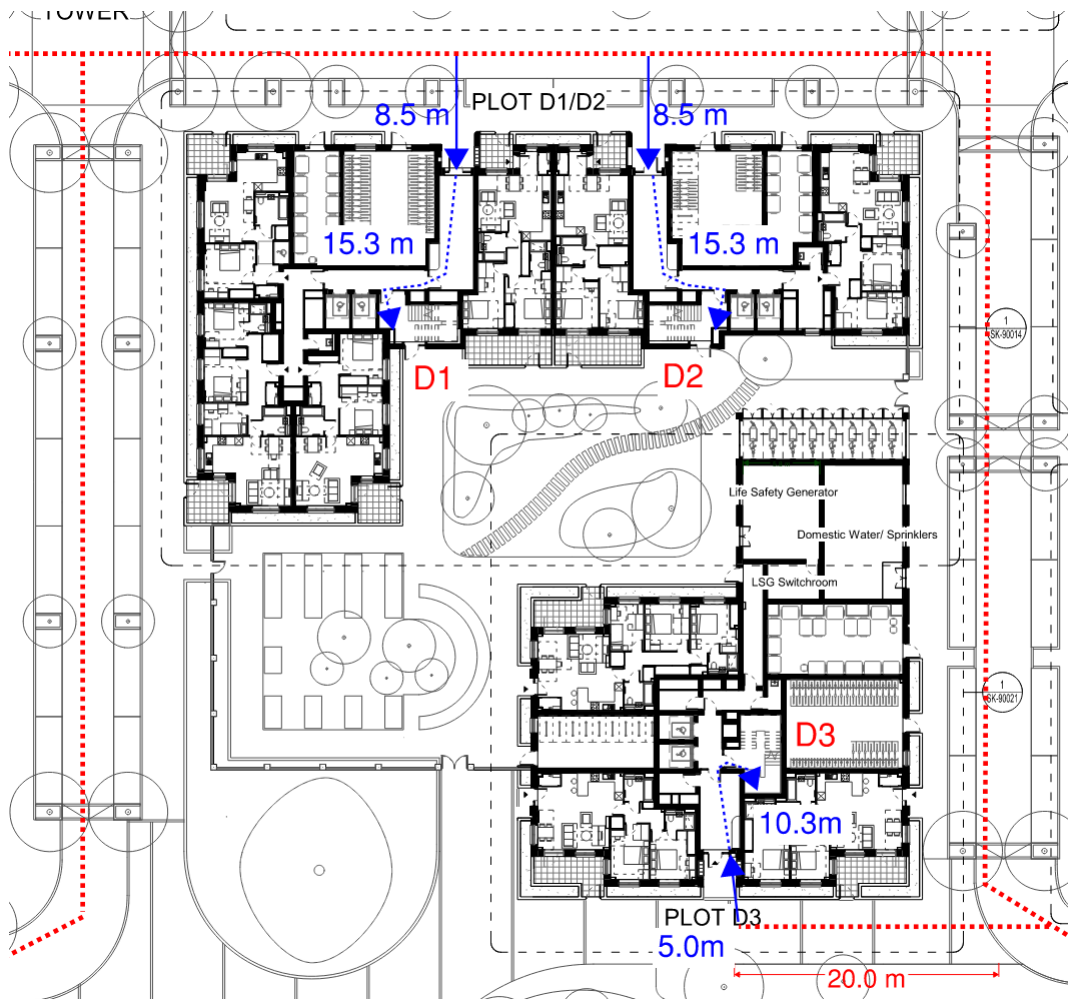


Figure 25: Main Access Assessment

7.1.2 Access Routes

Under the basis that the building is afforded rising main tender access is to be designed for pump type appliances taking into account London Fire Brigade GN 29 (24). Accordingly, all roadways required to achieve the access requirements are to be designed to achieve the following dimensions:

Table 19: Roadway Criteria for Pump Appliance

Location	Guidance
Width of Road between Kerbs	3.7m
Width of Gateways	3.1m
Turning Circle Between Kerbs	16.8m
Turning Circle Between Walls	19.2m
Clearance Height	3.7m
Minimum Carrying Capacity	14.0 tonnes ^A
Maximum Dead-End Travel Distance	20m
Note A: In accordance with London Fire Brigade GN 29	

7.2 Water Supplies

The water supply for firefighting intervention is expected to be provided by public hydrants.

Existing hydrants are to be located within 100m of the dry riser inlets. New fire hydrants are to be provided within 90m of all dry riser inlets.

The location of the proposed hydrants is shown in the figure below. It has been assessed that the proposed hydrants are in line with the recommendations of BS 9991.

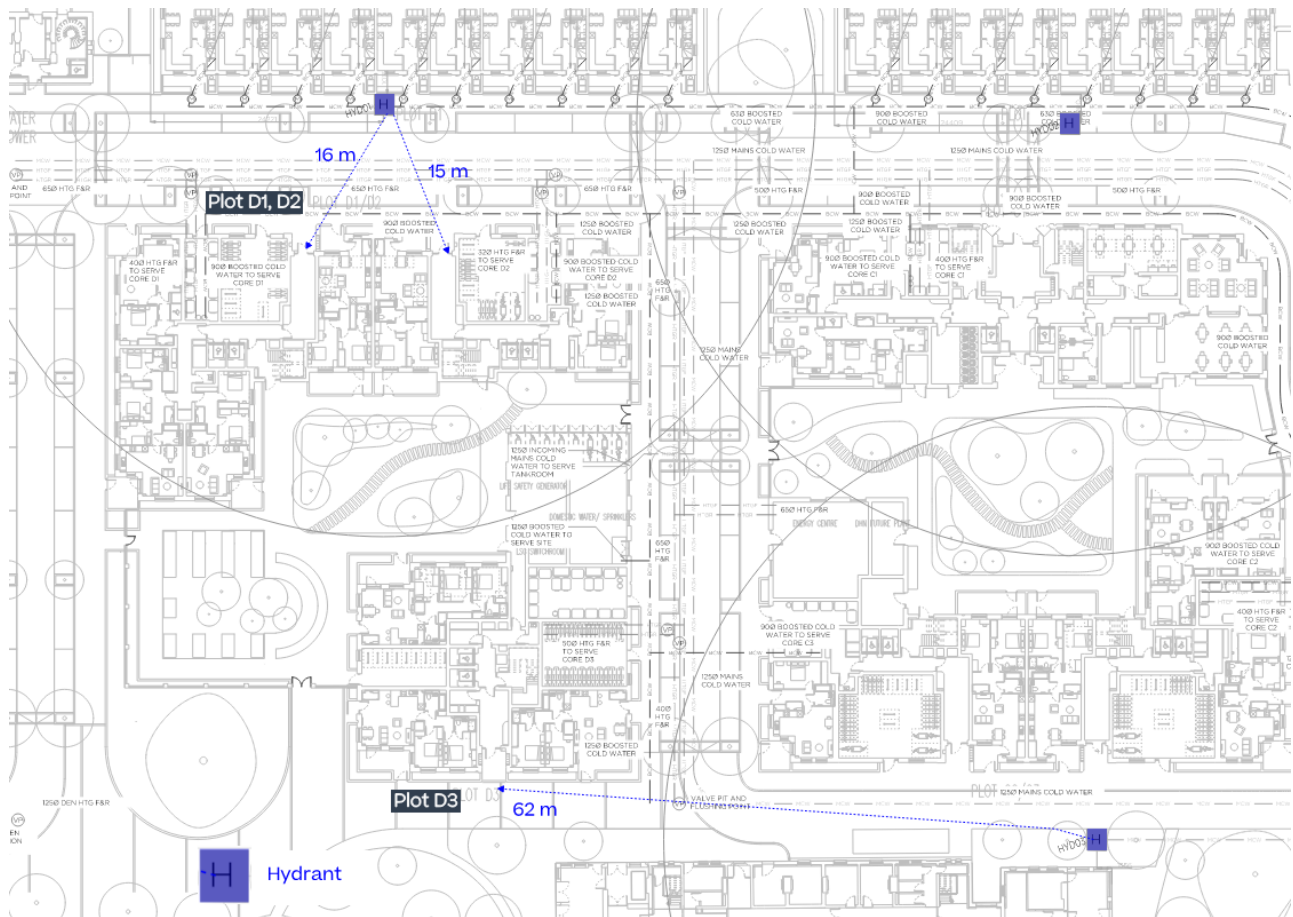


Figure 26: Hydrant Locations

7.3 Access to Buildings

7.3.1 Rising Mains

A rising mains system is to be provided in accordance with the guidance of BS 9990 (25) where outlets are to be provided at each level in the locations indicated in the stair as indicated in **Figure 27** below.

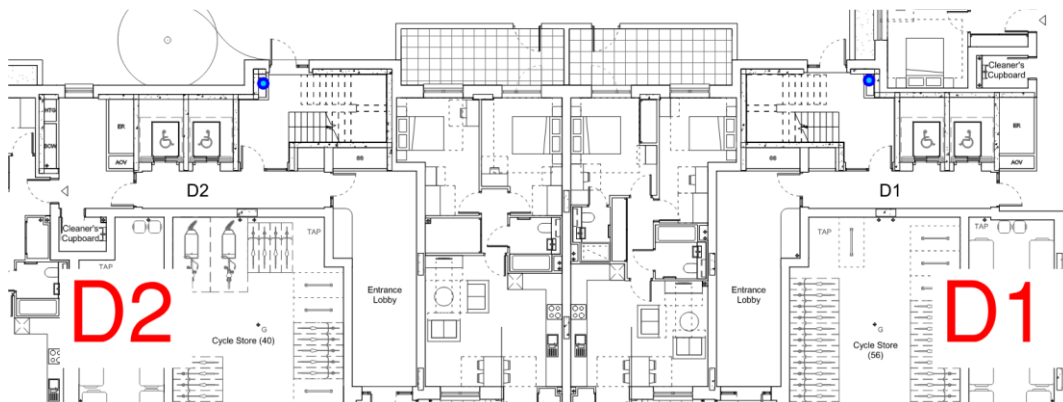


Figure 27: Mains Outlet Location D1 & 2

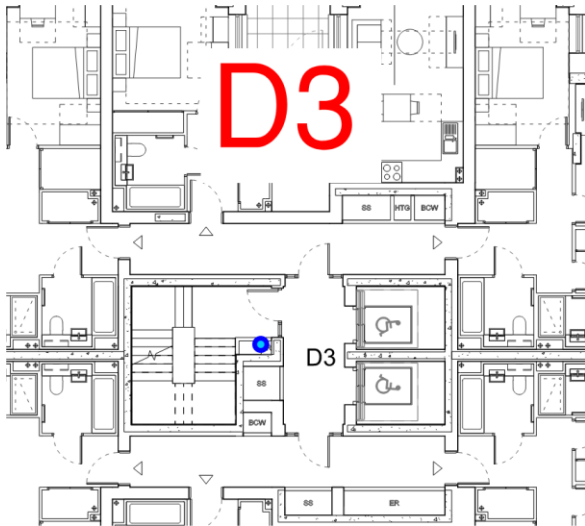


Figure 28: Main Outlet Location D3

7.3.2 Fire Fighting Shafts

Under the basis that the upper most storey of Block D3 is assessed as being >18m above the fire service access level (see **Section 2.1.2**) fire fighting shafts are to be provided in the following locations to achieve the following access criteria:

- All parts of every floor are reachable within a 60m hose lay from the rising main outlet, and the building is provided with sprinklers.

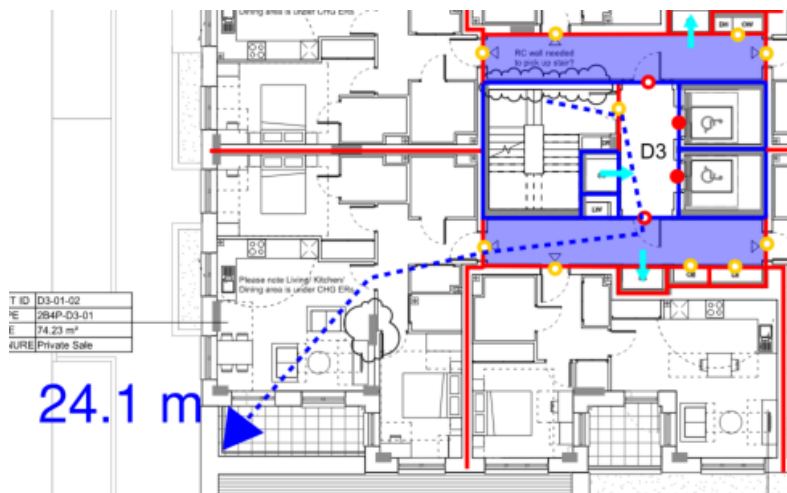


Figure 29: Hose Laying Distance D3

The fire fighting shaft is formed of the following major elements:

- Fire fighting stair.
- Lift lobby.
- Fire fighting lift.

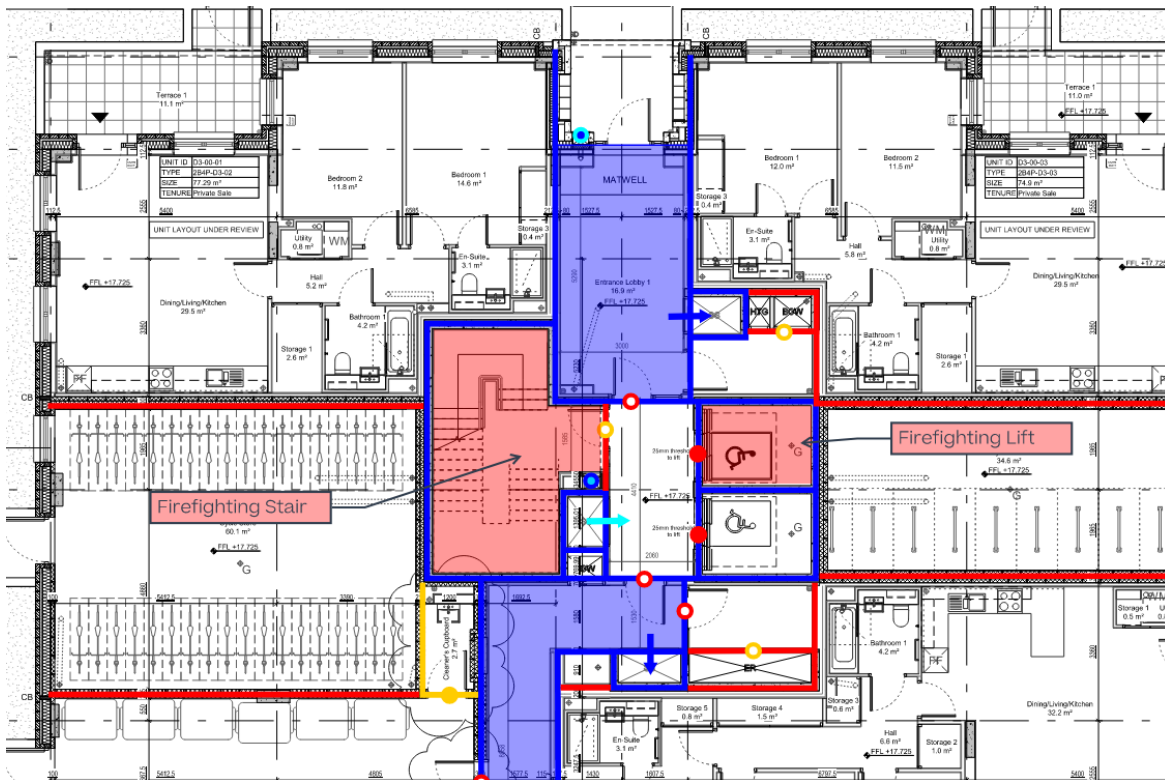


Figure 30: Block D3 | Firefighting Shaft

Note: This is in line with Catalyst ER.

The elements are to be enclosed and separated from each other by construction which achieves the following:

- Fire resistance is to achieve the periods indicated in **Section 5.2**.
- Unless constructed of brick or concrete, all partitions are to achieve the following standard of impact resistance when tested in accordance with BS 5234-2:

Table 20: Fire shaft partition robustness

Test	Severity	Criteria
Stiffness	500N	No significant damage, maximum deflection B) 10 mm and residual deflection 1 mm
Small Hard Body Impact	10 N.m	No significant damage
	30 N.m	No perforation
Large Soft Body Impact	100 N.m	2mm maximum deformation
	120 N.m	No collapse or dislocation
Crowd Pressure	1.5 kN/m	No collapse or dangerous damage

Note: This does not apply to construction of the protected residential corridor.

Fire Fighting Stair

The firefighting stair is to be provided with a tread width of no less than 1100 mm tread width; however, handrails may project into the width by 100 mm at each side. Firefighting stairs are to be designed in accordance with BS 5395-1 (26).

Only services that serve a firefighting stair may be accessed from within a firefighting stair.

The firefighting stairs should be equipped with emergency lighting.

Fire Fighting Lift

The lift indicated in **Figure 30** is to be designed to achieve the following criteria for a firefighting lift:

- The lift car is to be designed in accordance with BS EN 81-72 (27).

Additionally, these lifts need to meet the following key requirements:

- The lift car should be no less than 1100mm wide x 1400mm deep.
- The clear entrance width to the car shall be no less than 800 mm.
- The lift is to be provided with a firefighting switch at ground level to be located within 2m of the lift, and at a height of between 1.4 m and 2.0 m above floor level.
- The lift is to be provided with secondary power supply.
- The lift core is to be provided with either:
 - o Measures to limit the ingress of water into the lift core such as raised thresholds.
 - o Measures to limit the accumulation of water in the pit, such as sump-pumps.

7.3.3 Fire Service Access and Information

A Premises Information Box (PIB) should be located in a prominent location adjacent to the main entrance to each block. This information box should contain the information as recommended by the LFEPA Fire Safety Guidance Note No.70.

It is strongly recommended that these PIB's are provided with any necessary security overrides to provide the fire service free access into the building.

Note: This is in line with Catalyst ER.

7.4 Way Finding Signage

To assist fire service, identify each floor level in blocks of flats >11m from Ground Floor Level, floor indicator signs and flat indicator signs are to be provided in accordance with the following sub sections.

7.4.1 Floor Identification Signage

The floor identification signs are to meet all the following points:

- The signs are to be located of every landing of a protected stairway and every protected corridor into which a firefighting lift opens.
- The text should be in sans serif typeface with a letter height of at least 50mm. The height of the numeral that designates the floor number should be at least 75mm.

- The signs should be visible from the top steep of the firefighting stair and, where possible from inside a firefighting lift when the lift car door opens.
- The signs should be mounted between 1.7m and 2m above floor level and, as far as practicable, all signs should be mounted at the same height.
- The text should be on contrasting background, easily legible and readable in low level lighting conditions or when illuminated with a torch.

7.4.2 Wording for Floor Identification Signage

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

- The floor closest to the mean ground level should be designated as either Floor 0 or Ground Floor.
- Each number above ground floor should be number sequentially beginning with Floor 1.
- A lower ground floor should be numbered sequentially beginning with Floor -1.
- Each floor below the ground floor should be numbered sequentially beginning with Floor -1 or Basement 1.

7.4.3 Flat Indicator Signage

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

- The signs should be immediately below the floor identification signs, such that the top edge of the sign is no more than 50mm below the bottom edge of the floor identification sign.
- The wording should take the form Flats X-Y, with the lowest flat number first.
- The text should be in sans serif typeface with a letter height of at least half that of the floor indicator sign.
- The wording should be supplemented by arrows when flats are in more than 1 direction.
- The text and arrows should be on contrasting backgrounds, easily legible and readable in low level lighting conditions or when illuminated with a torch.

Note: in the case of multi storey blocks of flats with two or more entrances, the flat number should be indicated on the normal access storey.

7.5 Evacuation Alert System

An Evacuation alert system designed and installed in line with BS 8629 is to be provided for block C2& 3 as they are >18m in height. This is in accordance with **Clause 4 Catalyst ER**.

8 FIRE SAFETY MANAGEMENT

8.1 Introduction

The ongoing management and maintenance of the building shall fall under the control of the Regulatory Reform (Fire Safety) Order 2005. So as to allow for any future fire safety management to be co-ordinated with design of this building this section is provided to identify:

- The minimal standard of Fire Safety Management upon which this Fire Strategy has been developed. And,
- Specific Fire Safety Management requirements which are made as part of the Fire Strategy which must be adopted as part of the Fire Safety Management Plan to maintain the building in a condition consistent with the Fire Strategy.

8.2 Management Level

This fire strategy has been developed on that basis that the Fire Safety Management of this building will achieve at least the standard required to comply with the Regulatory Reform (Fire Safety) Order 2005.

Note: It is to be ensured that the Catalyst ER, in particular CHG DG 01_02.2 Fire Safety Procedures 211119, are understood, implemented and maintained throughout the building life.

9 CO-ORDINATION OF SERVICES



9.1 Services

9.1.1 Power Supply E-Bike Charging Stations

On ground floor of all blocks cycle rooms are provided. To make sure firefighters can adequately tackle a potential fire caused by a malfunctioning charging dock of e-bikes, a switch should be sited close to the entrance of the room. By operating the switch, all power supply to the charging docks should be shut down.

This switch should be marked clearly and conspicuously. In the Personnel Information Box, information about this switch should be provided as well.

9.2 Lifts

When activating the evacuation lift switch or at activation of the fire detection and alarm system, the evacuation lift should ignore all calls and return to the final exit level. There it should be parked with the doors open. After this stage, it should only be operated using the lift car controls.

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Appendix A FIRE STRATEGY DRAWINGS

Appendix B COOKING FACILITIES ASSESSMENT



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