

**Fire Strategy – RIBA
Stage 3
Seven Sisters
Warehouse Project**

2 November 2023

Kempton Investments

14702BC



BB7

Revision History

Version	Date	Author	Comments
01	03/02/2023	J. Donohoe	First Issue
02	31/10/2023	G. Scott	Update to Cluster Entry
03	01/11/2023	G. Scott	Drawing Amendments
04	02/11/2023	J. Donohoe	Update following client feedback

Document reference

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The validity of this document is dependent upon the recommendations being implemented in full and as described. This document relates to a development that is subject to review from Approval Authorities. It should be ensured that the contents of the document are agreed with all the relevant approval bodies prior to implementation.

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1. Legislation

1.1 Building Regulations 2010 (as amended)

The Building Regulations 2010 (as amended) [1], produced under the Building Act 1984 [2], is the primary legislation controlling building work and applies to the majority of new or materially altered buildings. The fire safety requirements are given in Part B of Schedule 1 to the Building Regulations and make requirements for specific areas:

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

The recommendations contained within Approved Document B, Volume 2: 2019 (including 2020 and 2022 amendments (AD B)) [3] have been used for the development as the benchmark for the fire safety design. Reference has also been made to other relevant British and European standards where appropriate.

It is important to note that, as is the case with many complex buildings/developments, it is not always possible to apply the prescriptive recommendations of fire safety guidance in full. This report may therefore propose additional 'fire-engineered' solutions which offer an alternative method of meeting the functional requirements of the Building Regulations. As with all engineered solutions, the importance of early discussion and agreement with the relevant Approval Authorities must be emphasised.

Responsibility for deciding if the requirements of the Regulations have been met rests with the building control body (Local Authority Building Control, or an Approved Inspector).

1.2 Construction Design and Management

UK projects are subject to the requirements of the Construction (Design and Management) Regulations 2015 (CDM) [4]. The CDM Regulations 2015 govern the management of health, safety, and welfare when undertaking construction projects. The CDM Regulations apply to all building and construction work, including the construction, alteration, conversion, fitting-out, commissioning, repair and maintenance, decommissioning, demolition, or dismantling of a structure.

When preparing or modifying a design, the designer must consider the general principles of prevention and any pre-construction information to eliminate, so far as is reasonably practicable, foreseeable risks to the health or safety of any person. These set out the principles duty holders should use to direct their approach to identifying the measures necessary to control the risks to health and safety in a particular project. The general principles can be summarised as:

- Avoiding risks where possible,
- Evaluating those risks that cannot be avoided, and
- Putting in place proportionate measures that control them at the source.

Where any recommendations contained within this report specify materials, products, or construction methods these will have been assessed, in accordance with CDM Regulations 11 and 18 (duties for designers). If these involve significant residual risks or health and safety-critical assumptions, this information will be made available to the Principal Designer. Where the architect or other consultants use all or part of this report to specify works, it is assumed they are competent in alerting the Client, Principal Designer, Designers, Contractors and Building Occupier if any issues arise under the CDM Regulations.

1.3 Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order 2005 [5] places a general duty of fire safety care on employees, occupiers, and/or owners of businesses to provide and maintain adequate fire precautions. The legislation is supported by requiring a fire risk assessment and a fire safety plan.

The Order places a responsibility on the responsible person to carry out a fire risk assessment on the premises. This process looks to:

- Identify potential fire hazards.
- Evaluate the risk from the hazards.
- Identify who would be at risk.
- Identify an adequate level of fire precautions to compensate for the risk.

The significant findings of the fire risk assessment should be recorded if the responsible person employs five or more employees.

The fire safety management plan details the arrangements to implement, control, monitor and review fire safety standards and to ensure those standards are maintained. The plan describes the arrangements for effectively managing fire safety so as to prevent a fire from occurring and, in the event of fire, to protect people and property.

A fire safety management plan should be completed on the occupation of the premises and a fire risk assessment should be undertaken following the occupation to comply with Article 9 of The Regulatory Reform (Fire Safety) Order 2005.

The responsible person should, on occupation, provide adequate fire safety information to all eventual residents of the apartments. This could be in the form of a home user guide to include basic fire prevention measures and information regarding the fire evacuation strategy and any associated procedures (which could be tailored to the needs of the individual tenant e.g., different language). Further information that can be provided to occupiers of dwellings in residential buildings include an example fire evacuation plan.

The fire emergency plan ought to be communicated to each resident upon occupation; residents ought to have a clear understanding of what actions they should take in the event that a fire scenario impacts the evacuation strategy and they may need to evacuate the building.

1.4 Regulation 38

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

The aim of this regulation is to ensure that the person responsible for the building has sufficient information relating to fire safety to enable them to manage the building effectively. Regulation 38 will be achieved when the person responsible for the building has all the information to enable them to do all of the following:

- Understand and implement the fire safety strategy of the building.
- Maintain any fire safety system provided in the building.
- Carry out an effective fire risk assessment of the building.

Fire safety information should be given to the responsible person at one of the following times.

- When the project is complete.
- When the building or extension is first occupied.

Essential information

Basic information on the location of fire protection measures may be sufficient. An as-built plan of the building should be provided showing all of the following:

- Escape routes – this should include exit capacity (i.e. the maximum allowable number of people for each storey and for the building).
- Location of fire-separating elements (including cavity barriers in walk-in spaces).
- Fire door sets, fire door sets fitted with a self-closing device and other doors equipped with relevant hardware.
- Locations of fire and/or smoke detector heads, alarm call points, detection/alarm control boxes, alarm sounders, fire safety signage, emergency lighting, fire extinguishers, dry or wet fire mains and other firefighting equipment, and hydrants outside the building.
- Any sprinkler systems, including isolating valves and control equipment.

Details should be provided on all of the following:

- Specifications of fire safety equipment provided, including routine maintenance schedules.
- Any assumptions regarding the management of the building in the design of the fire safety arrangements.
- Any provision enabling the evacuation of disabled people, which can be used when designing personal emergency evacuation plans.

1.5 London Plan

The London Plan [6] applies to both blocks. The most relevant policies from this guidance are Policy D12 and Policy D5, which both cover fire safety and inclusive design respectively. Compliance with The London Plan has been evaluated in the London Plan Fire Safety Statement, but will also influence this report.

1.6 Regulation 7(2)

Regulation 7(2) only applies to buildings with a storey at least 18 m above the ground level and which contains:

- One or more dwelling,
- An institution; or,
- A room used for residential purposes.

Based on these criteria, Regulation 7(2) applies to Block A but not Block B. Therefore, Block A is classified as a 'relevant building' and Block B is not. However, BB7 would recommend that both blocks are designed to meet the requirements under Regulation 7(2).

2. Introduction

2.1 Project overview

This project consists of constructing two blocks that will be primarily used for ‘warehouse living’ residential style accommodation. This type of living is typically close quarters, communal and community based. BB7 advise that the dwellings are best characterised as Houses in Multiple Occupation (HMO). In addition to the accommodation, both blocks have internal commercial areas. There are also commercial units at lower levels accessed directly from the external.

Altogether, there are 101 bedrooms on the proposed site. Both blocks are classified as Residential: other (2b), which is similar to student residential units. Despite this development featuring two blocks of clusters, the way in which the occupants are expected to use them (warehouse living) aligns with this purpose group more closely than a standard block of residential flats. Table 2.1 details an overview of each block.

Table 2.1 Overview of each block

Items	Block A	Block B
Number of clusters	10	3
Number of storeys	8 (ground + 7) 2 lower ground levels	4 (ground + 3)
Number of bedrooms	83	18
Number of escape stairs	2	1 (2 nd means of escape via a link bridge to Block A)

2.2 Drawings

This fire strategy report has been based on the set of drawings produced by Morris+Company, referenced in Table 2.2.

Table 2.2 Drawing references

Title	Drawing Reference	Revision	Date
Tewkesbury Ground plan	A343-MCO-XX-B2-DR-A-01108	3	13/12/2022
Tewkesbury Mezzanine plan	A343-MCO-XX-B1-DR-A-01109	2	
Ground plan	A343-MCO-XX-L0-DR-A-01110	3	
L1 plan	A343-MCO-XX-L1-DR-A-01111		
L2 plan	A343-MCO-XX-L2-DR-A-01112		
L3 plan	A343-MCO-XX-L3-DR-A-01113		
L4 plan	A343-MCO-XX-L4-DR-A-01114		
L5 plan	A343-MCO-XX-L5-DR-A-01115		
L6 plan	A343-MCO-XX-L6-DR-A-01116		
L7 plan	A343-MCO-XX-L7-DR-A-01117		
R1 Plan	A343-MCO-XX-R1-DR-A-01118		
Proposed short section	A343-MCO-XX-XX-DR-A-01301		

Title	Drawing Reference	Revision	Date
Proposed long section	A343-MCO-XX-XX-DR-A-01302		
Elevations	A343-MCO-XX-XX-DR-A-01201 to 01206	2	

2.3 Limitations

This document has been produced to assess this development's compliance with Part B (Fire Safety) of the Building Regulations 2010 (as amended) [1].

The Building Regulations deal explicitly with life safety. The aim of this report is to inform the design team of the recommended measures and to assist in design submission for approval. Whilst fire safety measures introduced for compliance with this life safety objective have a beneficial effect on reducing potential fire losses and extent of any consequential damage, it cannot be guaranteed that a fire will not start on the premises. In view of this, the opinion of the nominated insurance company and any other interested stakeholders should be sought.

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Systems and measures described establish a principle on which reliance may be placed by other parts of the fire strategy. This is done so on the assumption that all work will be done using appropriate materials and in a 'workmanlike' manner, as per the Building Regulations 2010.

Whilst this document details the fundamental strategy for a safe building, there is an ongoing management obligation to ensure that not only the active and passive fire protection facilities are correctly maintained, but that there are appropriate management procedures in place to facilitate a safe evacuation in the event of a fire. This is a fundamental requirement of life safety and is enforceable under the Regulatory Reform (Fire Safety) Order 2005 [5].

3. Project Description

This development consists of two multistorey buildings (referred to as 'Block A' and 'Block B') which are connected by a walkway on every floor above, and including, the first floor until Block B's highest storey. The plan for the ground floor of both blocks is shown in Figure 3.1. In addition to the accommodation, both blocks have internal commercial areas. There are also commercial units at lower levels accessed directly from the external.



Figure 3.1 Ground floor layout of both blocks.

3.1 Building Height

When measured from ground finished floor level, Block A and Block B have topmost finished floor heights of 25.83 m and 11.35 m respectively, see Figure 3.2.

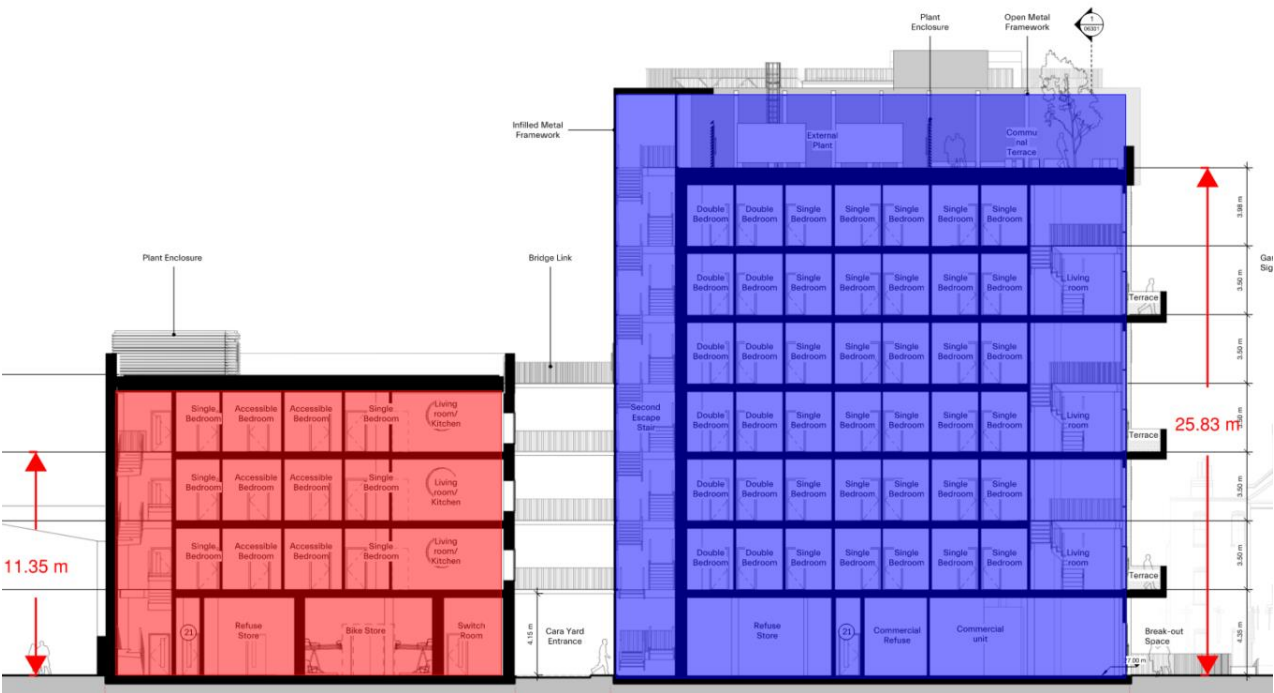


Figure 3.2 Building heights

4. Means of Escape

4.1 Evacuation strategy

Both buildings will adopt a 'simultaneous' evacuation strategy. All occupants evacuate the entire building upon alarm. For example, if a fire started in Block B; Block A should also fully evacuate.

4.2 Assembly Points

Evacuation assembly points are required (D12 A1b of the London Plan [6]) and should be confirmed as soon as possible. Assembly points should be sufficiently far from the premises to minimize interference with the Fire and Rescue Service or danger from falling debris but should be accessible and not so far away as to discourage people from assembling. The final locations of the assembly points will be determined by building management; however, BB7 suggest the following locations:

- Across the street from the main building (Eade Road level)
- Located away from the building and the route used by the Fire and Rescue Service (Tewkesbury Road level)

4.3 Travel Distances

The maximum travel distances are outlined in Table 4.1. Appendix 1 (A 1) shows the measured direct distances, which are used to compute the travel distances.

Table 4.1 Limitations on travel distance (actual)

Use of premises	One direction only (m)	More than one direction (m)
In bedrooms ⁽¹⁾	9	18
In bedroom corridors	9	35
Elsewhere	18	35
Plant room (within room)	9	35
Escape route in open air	60	100
Substation/switch room/ bin store	9	18
Commercial units	18	45

Source: Table 2.1 of AD B [3]

(1) Maximum part of travel distance within the room. This limit applies within the bedroom and any associated dressing room, bathroom or sitting room, etc. The distance is measured to the door to the protected corridor that serves the room or suite. Travel distance in the bedroom corridor applies from that point along the bedroom corridor to a storey exit.

(2) If the internal layout of partitions, fittings, etc. is not known, direct distances, rather than travel distances, should be assessed. The direct distance should be assumed to be two-thirds of the actual travel distance.

4.4 Escape from the bedrooms

There is a mixture of bedroom types throughout the development, comprising of accessible rooms, double rooms and single rooms. However, all the bedrooms throughout both blocks are single storey. These bedrooms are then arranged in clusters, which share common amenities such as a kitchen and a bathroom.

It is noted that a raised bed is typical of 'warehouse living' and is expected throughout this building. However, the design of these will remain unknown until the fitout stage and are therefore not considered in this report. The fitout, and any implications on travel distances and escape, should be considered upon install.

4.5 Vertical Circulation

Block A has a dedicated fire-fighting stair as well as a secondary escape stair. Block B has an internal stair, with access to Block A’s escape stairs via a bridge link. The escape stairs are shown in Figure 4.1 and Figure 4.2.



Figure 4.1 Stair locations (Block A)



Figure 4.2 Stair location (Block B)

4.6 Stair Widths

The minimum stairs widths are shown in Table 4.2. The final exits from these stairs should not narrow and should be at least the same minimum width as the respective stair.

Table 4.2 Stair Widths

Stair	Minimum Width
Block A (Internal) – Firefighting Stair	1,100 mm
Block A (Secondary Escape Stair)	1,000 mm
Block B	1,000 mm

4.7 Escape from common areas

4.7.1 Block A

4.7.1.1 Ground floor

There is one proposed cluster at the ground level of Block A. This cluster has its own independent entrance, as well as a route through the reception area. Both exits routes are remote from each other.

4.7.1.2 Other Floors

The clusters are accessed through a fire-fighting lobby from the fire-fighting stair or lift. Escape is via either the internal stair, secondary stair or the evacuation lift.

4.7.1.3 Block B

Block B has its own internal escape stair and evacuation lift. Furthermore, occupants from Block B can also access the escape stairs in Block A via a link bridge.

4.8 Door Widths

Based on bed numbers, no more than 60 people will need to exit each storey at any time. Therefore, all doors except the final exits, will have a minimum width requirement of 750 mm. These minimum requirements may be superseded by other requirements, for example, those linked to accessibility.

4.9 Escape from ancillary accommodation

4.9.1 Internal

The internal ancillary accommodation on this site includes the bike store and the refuse stores. These specific areas will have sufficient means of escape as both areas are accessed externally. Both commercial areas, in each block, are also accessed externally.

4.9.2 Roof

The lower roof is split into terrace and plant areas.

The upper roof will have an array of photovoltaic panels installed. The access for this is provided by a ladder from the lower roof level. The maximum travel distance on this level is c. 28 m; and is therefore within the 60 m limit for an open-air escape route.

4.9.3 Tewkesbury level

The external ancillary accommodation at the Tewkesbury level is split into commercial units, a substation, a switch room and a bin store.

The external escape route should comply with Sections 2.30-2.32 of AD B. the stair should follow Sections 3.31-3.33 of AD B.

4.10 Escape Lighting

All escape routes should have adequate artificial lighting. If the mains electricity power supply fails, escape lighting should illuminate the routes. Escape stair lighting should be on a separate circuit from the electricity supply to any other part of the escape route.

Escape lighting should conform to BS 5266-1: 2016 [7].

4.11 Escape Signage

Every doorway or other exit providing access to a means of escape, other than exits in ordinary use (e.g., main entrances), should be distinctively and conspicuously marked by an exit sign in accordance with BS ISO 3864-1:2011 [8] and BS 5499-4:2013 [9].

4.12 Disabled evacuation

The high level of compartmentation in this development should allow disabled occupants to reach a place of safety, where they may have to wait before evacuating. It is the responsibility of the premises management to assess the needs of all potential evacuees when formulating safe evacuation plans.

To comply with policies D5(B5) of the London Plan 2021, a safe and dignified emergency evacuation for all building users should be incorporated. In the interests of fire safety and to ensure the safety of all building users, the highest standards of fire safety will be provided.

An evacuation lift will be provided for each block. In accordance with Policy D5 of the London Plan, where lifts are installed, at least one lift per core should be a suitably sized fire evacuation lift to evacuate people who require level access from the building. These evacuation lifts should be accessed via a ventilated lobby, and the ventilated lobby should not give direct access to any clusters or ancillary accommodation. As drawn, this requirement will be adhered to, as shown in Figure 4.3 and Figure 4.4 (highlighted in green). The lower ground areas require disabled occupants to use the lift to the lowest of the sub-ground floors as the exit on the higher floor goes out onto stairs. The escape route for disabled occupants should be clearly marked.

The refuge areas within this development should be of sufficient size to accommodate a wheelchair and to allow the user to manoeuvre into the wheelchair space, without undue difficulty. The space provided for a wheelchair in a refuge area should not be less than 900 mm x 1400 mm with access doors being at least 850 mm wide.

Manual call points should be provided to the refuge areas to alert management of people waiting in the refuges. These call points should also be in accordance with BS EN 54-11:2001+A1:2006 [10].

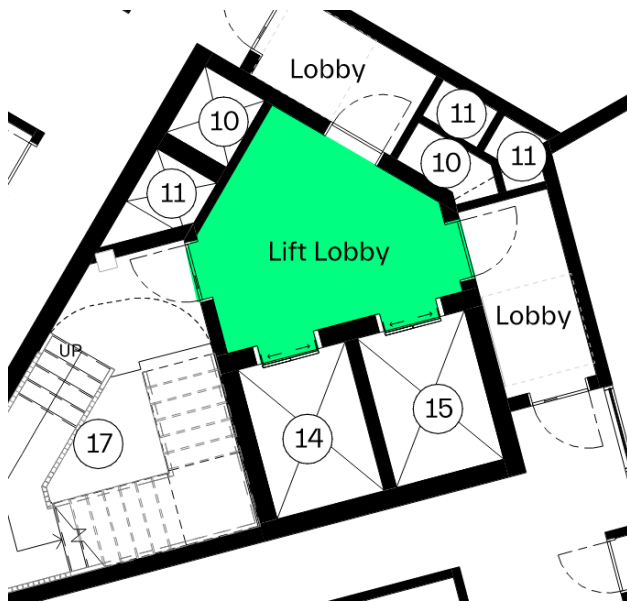


Figure 4.3 Block A evacuation lift lobby

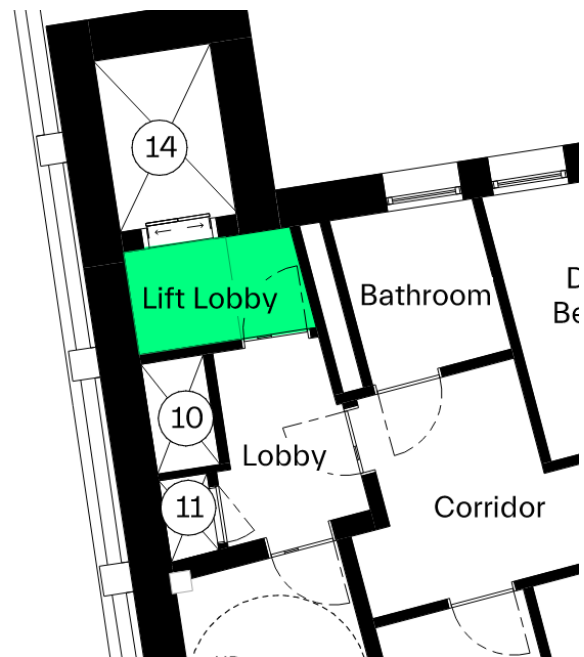


Figure 4.4 Block B evacuation lift lobby

4.12.1 Evacuation Lifts

Both blocks will be provided with an evacuation lift. In addition, a disabled refuge area will be provided to both blocks. These areas will act as a place of relative safety while they wait for the lift to evacuate.

4.12.2 General recommendations

A management policy should be implemented which addresses the evacuation of the development. This will need to be developed with the client during later stages of the project. Those responsible for evacuation planning need to consider a flexible plan depending on the need for evacuation, different possible scenarios and for the actual conditions as the evacuation progresses.

Personal Emergency Egress Plans (PEEPs) can be compiled, performed, reviewed and should be carried out prior to occupation. These may necessitate changes to manage different situations, such as the planned sequence of evacuation. In addition to the management policy, all residents will receive an information pack which will explain the evacuation from their apartment and building, which can be in multiple languages for the end user.

The Fire and Rescue Service may take management of the evacuation on their arrival, but this should not be assumed; the evacuation of the building is the responsibility of the building management. The person responsible for the evacuation will need to pass information to the Fire and Rescue Services.

5. Passive Fire Protection Systems

5.1 Test standards

Fire resisting elements selected should meet the performance standards recommended by the relevant part of BS EN 1363, BS EN 1364, BS EN 1365 or BS EN 1366.

5.2 Elements of structure

Based on the height of the buildings, periods of fire resistance will be provided, and the requirements have been outlined below:

Table 5.1 Structural Fire Resistance

Building	Structural Fire Resistance
Block A	90 minutes
Block B	60 minutes

5.3 Applications to elements of structure

Elements of structure that are subject to protection, as mentioned in Section 5.2, include:

- Beams.
- Columns.
- Floors (whether compartment floors or not).
- Compartment walls.
- Loadbearing walls (from both sides).
- An external wall structure supporting fire-resisting elements for the prevention of external fire spread.

Structural elements that are self-supporting or only provide support for a roof need not have any applied fire protection unless any of the following apply:

- a. They also perform the function of a floor
- b. They support life safety plant equipment
- c. They are essential for the stability of an external wall requiring fire-resisting construction.

Where the stability of one element relies on the stability of another element with a lesser fire-resisting period, the higher of the two periods will be applied to both elements.

5.4 Compartmentation

Passive fire safety measures in terms of compartmentation will be provided throughout the development. A summary of the compartmentation requirements is provided in Table 5.2.

The fire resistance will be provided in accordance with BS EN 13501-2:2016 [11]. Where walls and floors are provided for fire compartmentation and act as elements of structure, the higher fire rating takes precedent.

Table 5.2 Compartmentation

Area	Block A	Block B	Comments	Fire doors
Compartment floors	REI 90	REI 60	From underside	Same as floor in which it is fitted.
General compartment walls	REI 90	REI 60	Each side separately	Same as for the wall in which it is fitted.
Firefighting shaft	REI 120 (REI 60 within the shaft)	N/A	From remote side of shaft	E 60 S _a (E 30 S _a within the shaft)
Walls separating clusters from adjacent areas (e.g., kitchens) of the same building.	REI 60	REI 60	Each side separately	E 30 S _a
Risers/ Protected Shafts	REI 90	REI 60	Each side separately	Half the period of fire resistance of the wall in which it is fitted, but 30 minutes minimum and with suffix S _a
Bin stores, post rooms, plant rooms, cycle stores, other ancillary rooms	REI 60 (120 REI for life safety plant)	REI 60 (120 REI for life safety plant)	Each side separately	Same as for the wall in which it is fitted.
Protected lobbies/ corridors	REI 30	REI 30	Each side separately	E 30 S _a
Encloses place of special fire hazard	REI 90	REI 60	Each side separately	Same as for the wall in which it is fitted.

5.4.2 Fire Curtain

Block A has communal areas that spread across two storeys at various levels. A fire curtain / shutter is proposed to separate these areas in the event of a fire, as the communal area staircase penetrates through a compartment floor.

The proposed location of the fire curtain / shutter is shown in Figure 5.1. This fire curtain should be employed upon the triggering of the alarm. The details of this will be developed at the next stage of design when the management plan has been further developed. A fire shutter should also be positioned between the reception area and the firefighting shaft in Block A, to maintain the compartmentation.

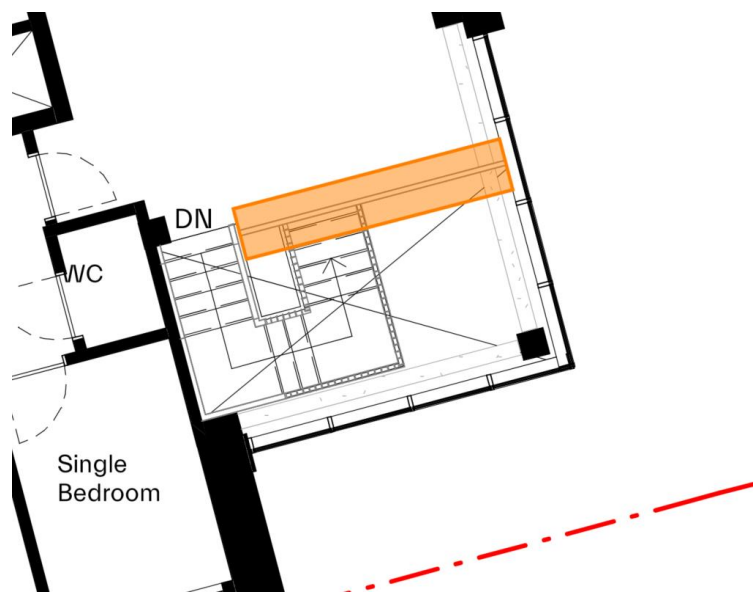


Figure 5.1 Location of fire curtain / shutter, highlighted in orange.

5.5 Linings

The surface linings of walls and ceilings should meet the classifications in Table 5.3.

Table 5.3 Classification of linings

Location	Classification in accordance with BS EN 13501-1: 2018
Small rooms of maximum internal floor area: a. 4 m ² in residential accommodation b. 30 m ² in non-residential accommodation	D-s3, d2
Other rooms (including garages)	C-s3, d2
Other circulation spaces	B-s3, d2 ⁽¹⁾

Source: Table 6.1 of AD B [3]

(1) Wallcoverings which conform to BS EN 15102: 2019 [12], achieving at least class C-s3, d2 and bonded to a class A2-s3, d2 substrate, will also be acceptable.

6. External Fire Spread

6.1 External walls

Block A is a relevant building. Hence, all materials within the external wall including any specified attachments must achieve a classification of Class A2-s1, d0 or better, as per Regulation 7(2).

Whilst Block B is not a relevant building, BB7 recommend that it is designed to achieve the requirements of Regulation 7(2); whereby all materials within the external wall including any specified attachments achieve Class A2-s1,d0 or better.

There are permitted exemptions, as per Regulation 7(3).

6.2 Construction of roof coverings

The roofs should be designed to achieve $B_{ROOF}(t_4)$ in accordance with BS EN 13501-5: 2016 [13].

6.3 Space Separation

The external fire spread for this building has been analysed in accordance with BRE BR 187 [14].

Appendix 2 (A 2) shows each emitter and provides an illustrative overview. Table 6.1 outlines the relevant information for each emitter.

Table 6.1 Emitter information

Emitter	Emitter width (m)	Emitter height (m)	Sprinklers	Boundary distance (m)	Acceptable unprotected area (%)
1	10.63	3.21	Yes	2.52	57.0
1b	10.63	3.15		2.52	58.0
2	3.51	6.78		2.52 ⁽¹⁾	64.6
3	15.48			1.47	13.0
4	5.84			2.07 ⁽²⁾	28.6
5	6.01	3.21*	No	0.00 ⁽³⁾	0.0
6	2.01			2.66	100.0
7	8.06			2.66	34.7
8	2.02	3.15*		3.36	100.0
9	5.72			5.18	100.0
10	6.27	3.94	Yes	6.27	100.0
11	3.04			2.54	56.4
12	6.85			8.61	100.0
13	19.44			5.59	100.0
14	13.32			1.47	47.0
15	13.25			2.07 ⁽²⁾	34.0
16	10.00			6.27	100.0
17	17.15	3.08		8.61	100.0
18	7.67			2.54	100.0

Emitter	Emitter width (m)	Emitter height (m)	Sprinklers	Boundary distance (m)	Acceptable unprotected area (%)
19	17.28			6.27	100.0
20	23.60			5.61	100.0
21	13.36			1.47	60.0
22	11.50	6.58		2.07 ⁽²⁾	42.6
23	25.03			6.27	100.0
24	23.61			5.61	100.0
25	13.34			1.47	28.2
26	18.09	7.06		5.61	100.0
27	13.34			1.47	26.2

*Architect to confirm

- (1) This distance was taken as the full distance to the opposing building, rather than halfway, as the opposing building on the same site and under the same ownership had no unprotected areas.
- (2) This distance was taken as the shortest boundary distance between the elevation and the opposing building.
- (3) This distance was taken as 0 m, see note 1.

7. Fire Safety Systems

7.1 Automatic fire detection and alarm systems

Due to the unique nature of the dwellings, a Category L1 system is to be installed throughout this development, as per BS 5839-1: 2017 [15].

The fire curtains (see Section 5.4.2) should be triggered upon local detection.

7.2 Automatic water fire suppression systems

Both Block A and B (including any lower floors) will be protected by an automatic suppression system. It is recommended that a Category 4 sprinkler suppressions system should be designed and installed in accordance with BS 9251: 2021 [16]. The sprinkler system will be extended to all ancillary areas within and below Block A and Block B.

As per BS 9251: 2021, where the area of the compartment exceeds 100 m², BS EN 12845:2019 [17] will need to be applied in full. The commercial unit in Block A exceeds the 100 m² limit; therefore, will need to be protected with a sprinkler system to BS EN 12845:2019. Alternatively, the unit could be sub-divided into smaller units, where each individual unit is less than 100 m².

It is proposed that the Tewkesbury Yard commercial units (stand-alone units, not part of the residential Block A or Block B) will not be provided with a suppression system.

7.3 Smoke management

Both blocks will be provided with a ventilated lobby, as well as an AOV at the head of the stair.

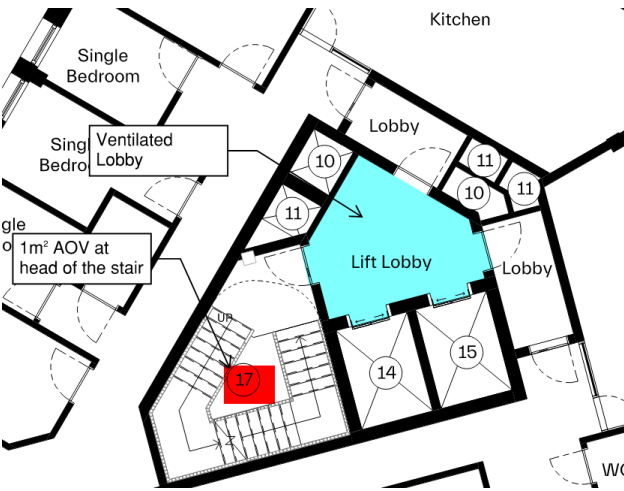


Figure 7.1 Ventilated Lobby (Block A)

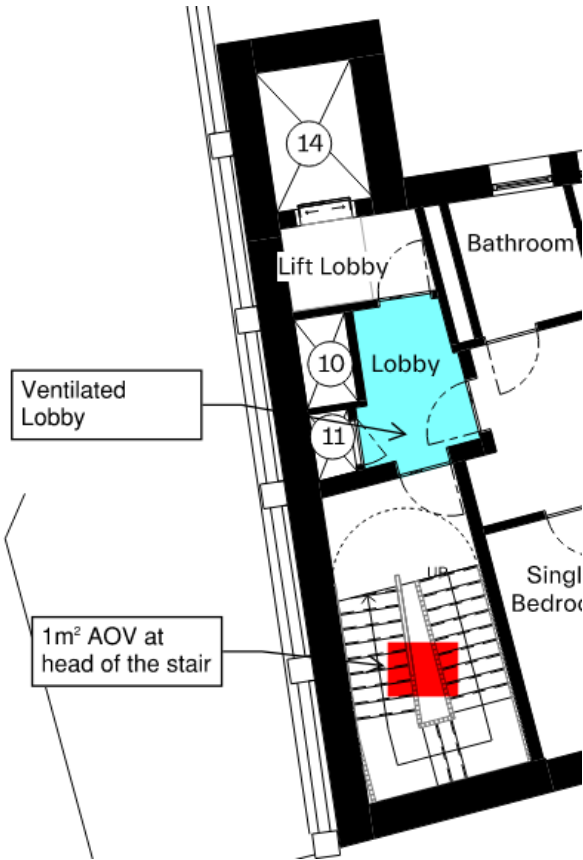


Figure 7.2 Ventilated Lobby (Block B)

8. Fire Service Access and Facilities

8.1 Vehicle access

The fire service will access the site via the surrounding road network, which should meet the requirements outlined in Table 8.1 below. The Fire Service vehicles should not have to reverse more than 20 m from the end of an access road.

Table 8.1 Fire and rescue access route specifications

Appliance	Minimum road width between kerbs (m)	Minimum gateway width (m)	Minimum turning circle between kerbs (m)	Minimum turning circle between walls (m)	Minimum clearance height (m)	Minimum carrying capacity (tonnes)
High Reach	3.7	3.1	26.0	29.0	4.0	17.0

Source: Table 15.2 of AD B [3].

8.2 Personnel access

Following discussions with the Approved Inspector, Fire Service access has been provided directly from the main road. This has been achieved by implementing a firefighting corridor (protected to 120 minutes REI), which leads from the fire appliance parking position on the main road to the protected zone for each block, see Figure 8.1 and Figure 8.2.



Figure 8.1 The firefighting corridor in Block A, highlighted in red.



Figure 8.2 The firefighting corridor in Block B, highlighted in red.

8.3 Information for the Fire Service

A secure information box provides a secure facility to store information about a building for use by the Fire Service during an incident.

Whilst only blocks of flats (purpose group 1(a)) with a top storey more than 11 m above ground level should be provided with a secure information box; BB7 recommend that the development is provided with a secure information box owing to the unconventional layout of the blocks.

Furthermore, BB7 recommend that wayfinding signage (as per AD B, vol 1) is provided to assist the Fire Service to identify each floor and provide information relating to which clusters are accessed on each storey.

8.4 Firefighting systems

8.4.1 Shafts

Block A has a storey above 18 m; therefore, a firefighting shaft has been provided. This is shown in Figure 8.3.

The firefighting shaft will include:

- 1,100 mm wide firefighting stair, with a 1.0 m² AOV at the head;
- A firefighting lift in accordance with BS EN 81-72:2020 [18] and BS EN 81-20:2020 [19]
- A ventilated firefighting lobby; assumed to be a mechanical smoke ventilation system which should demonstrate equivalent or better conditions in the lobby and stairs than would be provided by a natural shaft and as described in BRE Project Report 79204 [20].
- A dry fire main located within the firefighting lobby in accordance with BS 9990: 2015 [21].

Furthermore, as the firefighting shafts leads into a place of higher fire risk (the kitchen), an additional lobby has been provided to establish an additional level of separation and protection for the fire service.



Figure 8.3 The firefighting shaft, highlighted in red.

8.4.2 Hydrants

Hydrants should be provided within 90 m of the dry riser inlets. Each hydrant should be clearly indicated by a plate and in accordance with BS 3251: 1976 [22].

As the development is located in a populated area of London, it is expected that the existing hydrant provisions are sufficient. This should be confirmed by the architect.

8.4.3 Dry Fire Main

Both Block A (firefighting shaft) and Block B will be provided with a dry fire main.

Inlets will be adjacent to the Fire Service access positions to the buildings, and within 18 m of the appliance parking position.

8.4.4 Hose Coverage

For sprinkler protected buildings, hose coverage can be a maximum of 60 m from the fire main outlet. This is achieved in both Block A and Block B. Figure 9.15, Figure 9.16 and Figure 9.17, all in Appendix 3 (A 3) all show indicative plans for how the Fire Service could access the site. The hose distances that were used to create the green areas, are also detailed in Appendix 3 (A 3).

9. Conclusion

This development can meet the Functional Requirements (Part B) of The Building Regulations 2010 (as amended) [1], subject to the measures outlined in this report being incorporated into the design, and subject to formal approval from Building Control.

The fire strategy for the proposed building will need to be developed further as the building design progresses. Any significant future modifications to the building design will require further assessment, as it may adversely affect the original fire strategy.

A 1. Direct distances



Figure 9.1 Maximum dwelling direct distance on the ground floor (Block A)



Figure 9.2 Maximum dwelling direct distance for floors 1 to 7 (Block A)

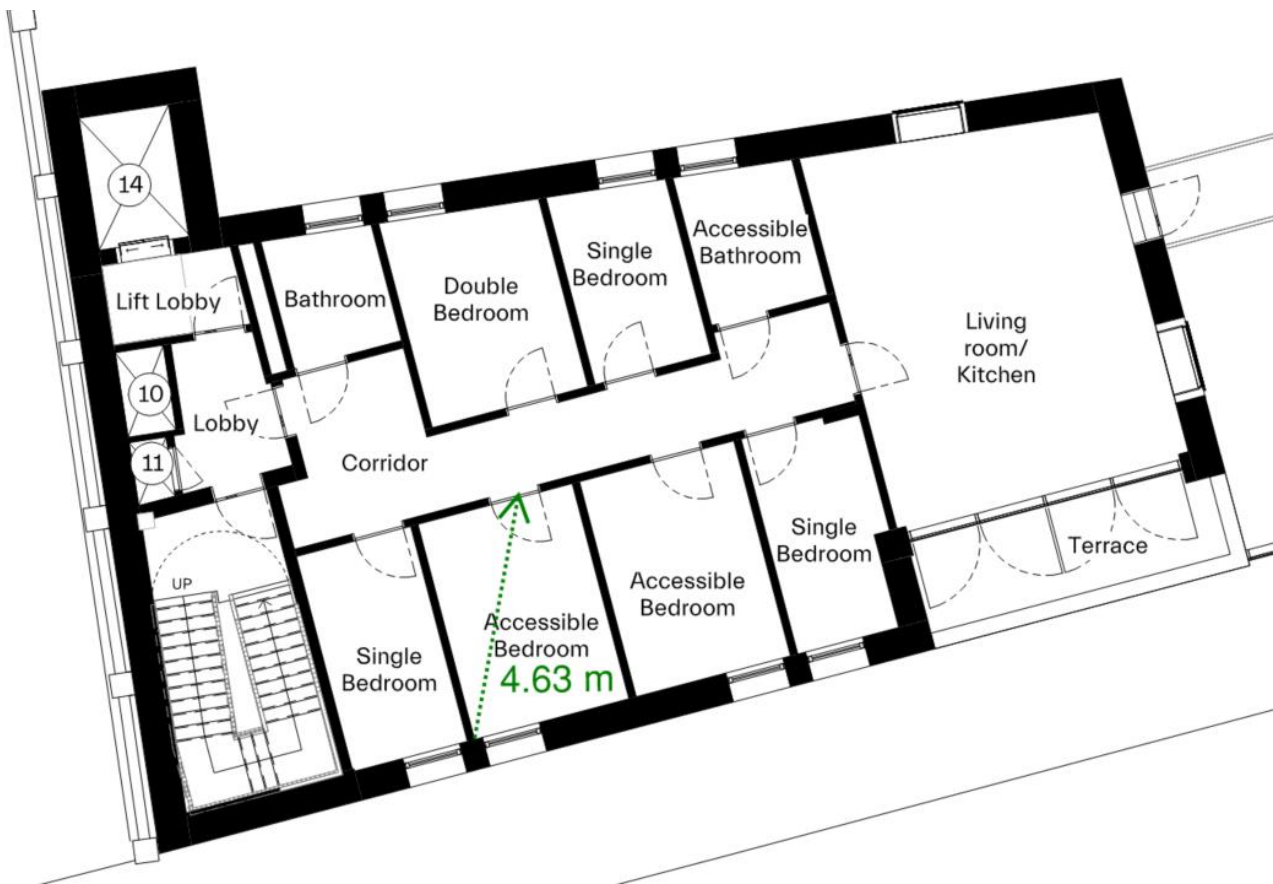


Figure 9.3 Maximum dwelling direct distance for floors 1 to 3 (Block B)

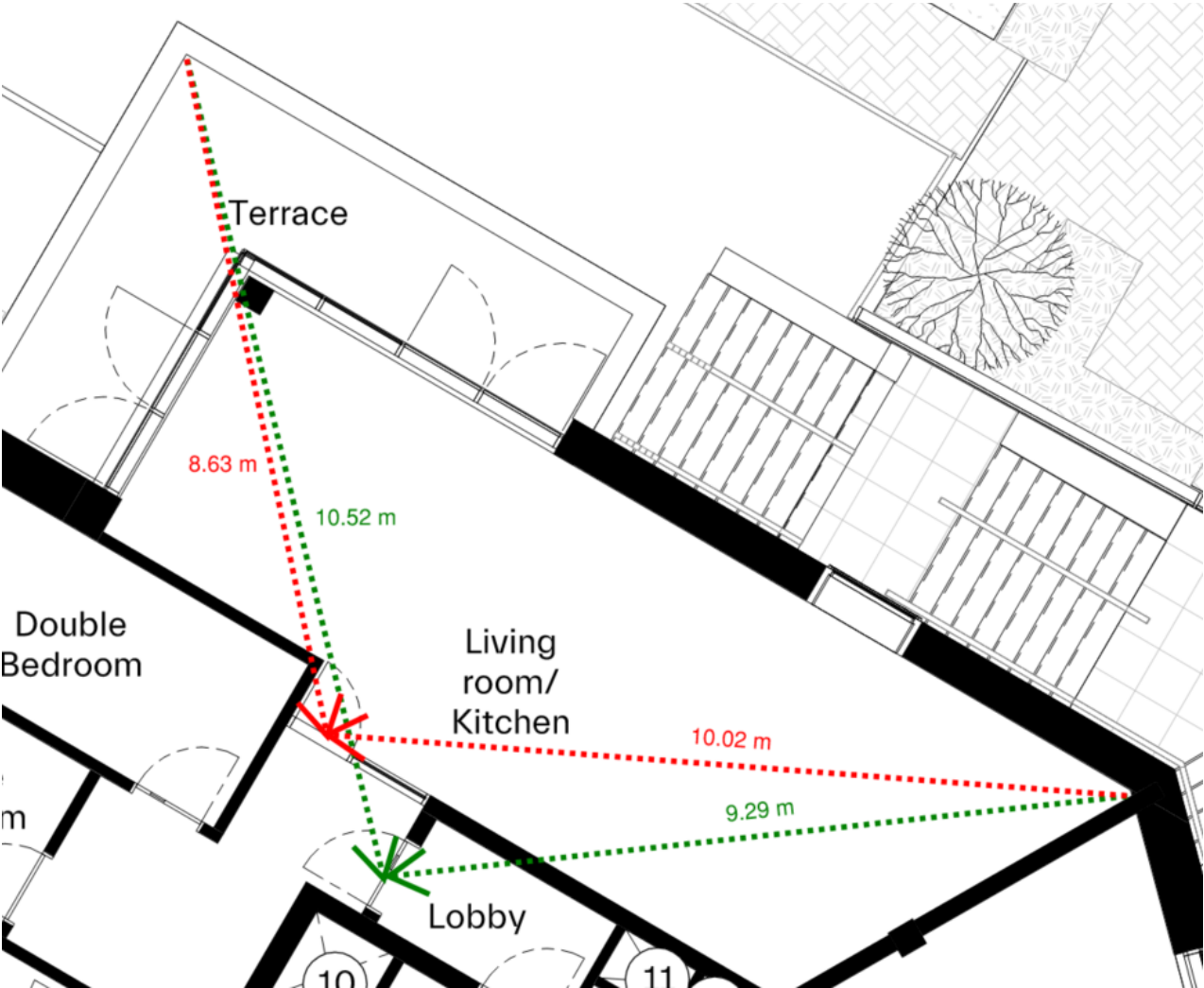


Figure 9.4 Maximum communal area direct distances for ground flat's communal areas (Block A). Green distances evacuate via the stair and red distances evacuate via the flat entrance.



Figure 9.5 Maximum communal area direct distances for ground flat’s corridors (Block A). Green distances evacuate via the stair and red distances evacuate via the flat entrance.



Figure 9.6 Maximum direct distances for general floor of Block A and Block B

A 2. External fire spread

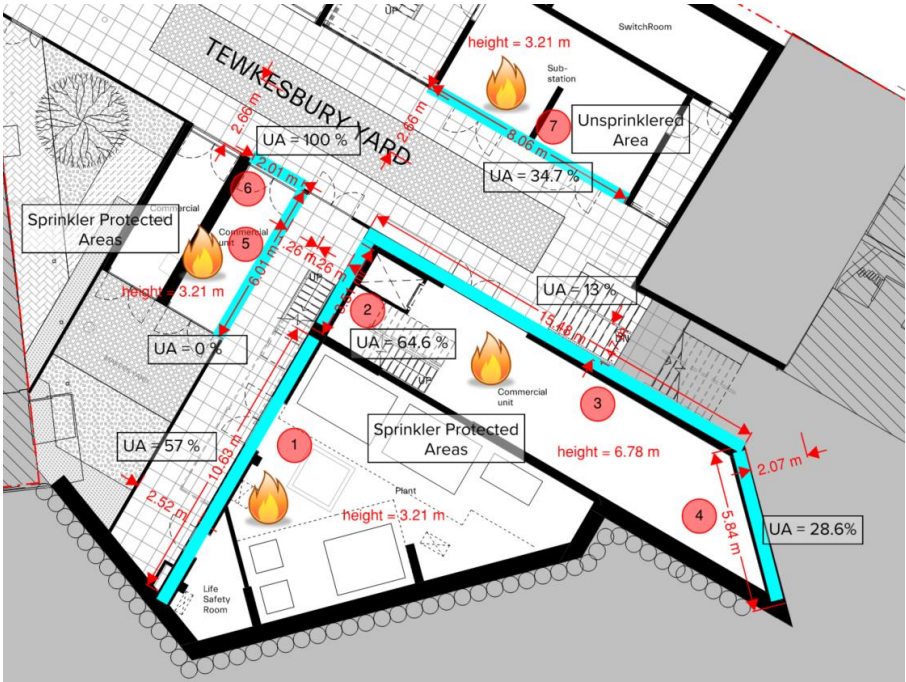


Figure 9.7 Lower ground Tewkesbury Yard level

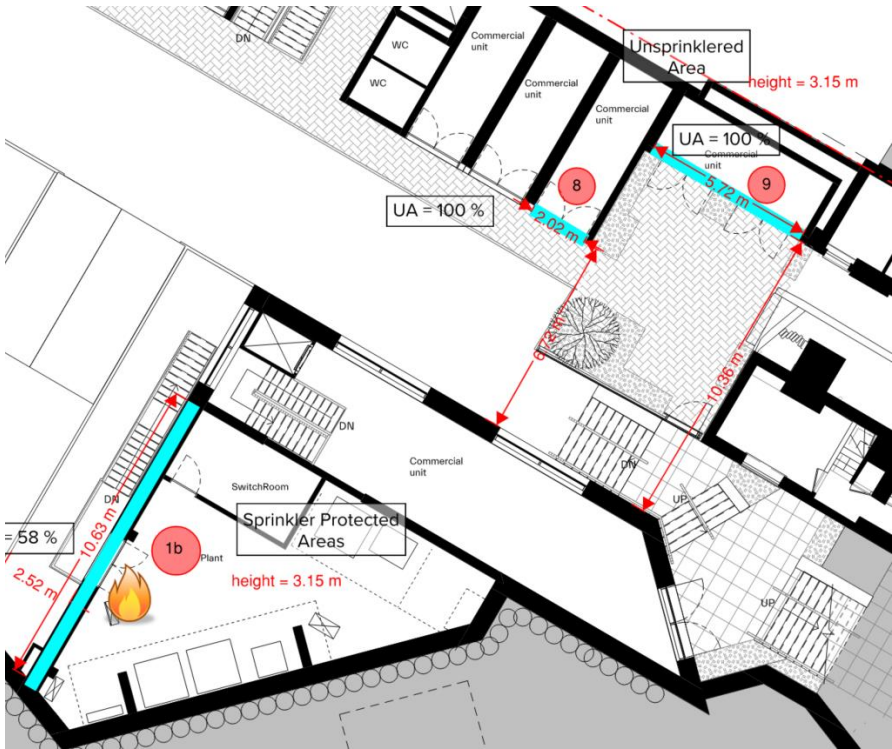


Figure 9.8 Mezzanine Tewkesbury Yard level

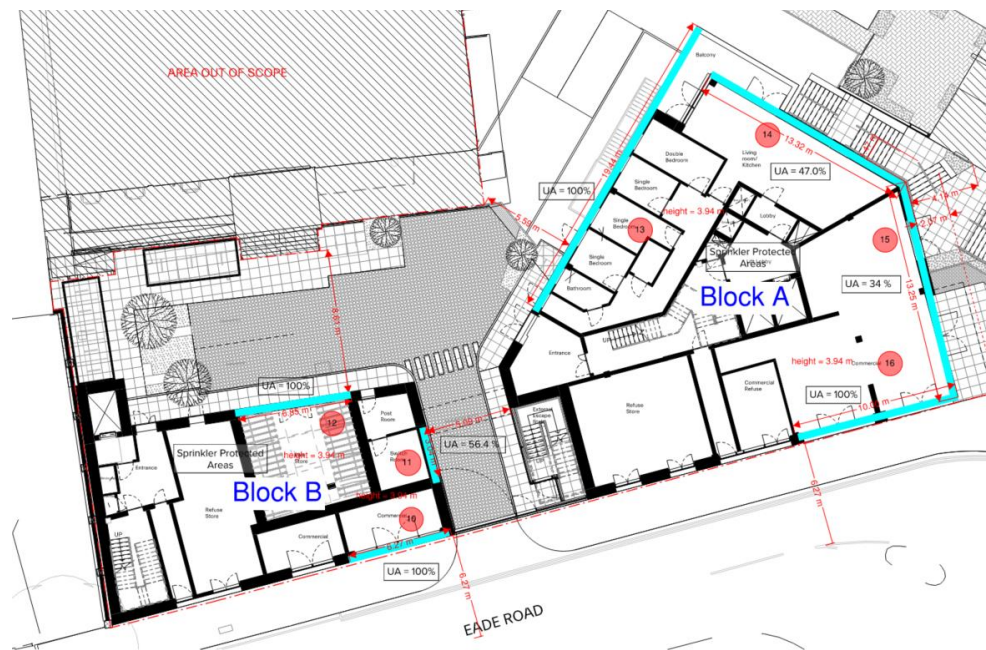


Figure 9.9 Ground floor Eade Road level



Figure 9.10 Generic upper floor



Figure 9.11 Sixth floor



Figure 9.12 Roof

A 3. Hose distances and access



Figure 9.13 Hose distances for the Tewkesbury Level



Figure 9.14 Hose distances for the mezzanine at Tewkesbury Level





Figure 9.17 Indicative plans that show Eade Road level access

To demonstrate that access and egress is provided to the Tewkesbury Road level for the Fire and Rescue Service, the client has provided some tracking drawings, produced by Velocity, these can be seen in Figure 9.19.



Figure 9.18 Tracking drawings for Eade Road



Figure 9.19 Tracking drawings for Tewkesbury Road level

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- [20] BRE, "Smoke Shafts protecting Fire-Fighting Shafts: their performance and design," Building Research Establishment Ltd, 79204, 2002.
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- [22] British Standards Institution, *BS 3251:1976 Specification. Indicator plates for fire hydrants and emergency water supplies*. British Standards Institution, 1976.

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