

Breakspear Road South,
Ickenham

**Planning Fire Safety
Strategy**

20 February 2023

Keltbray Holdings Ltd.
14771BC

BB7

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Contents

1. Introduction	1
1.1 Objective of Report	1
1.2 Project Description	1
1.3 Fire Strategy Summary	2
1.4 Declaration of Compliance	3
2. Legislation and Guidance	4
2.1 The London Plan	4
2.1.1 Overview of Policy D5 and D12	4
2.1.2 Proposed Fire Strategy	4
2.2 The Building Regulations 2010 (As Amended)	5
2.3 Purpose Group Classification	6
2.4 Regulatory Reform (Fire Safety) Order 2005	6
3. Means of Escape	7
3.1 Evacuation Strategy	7
3.2 Assembly Points	7
3.3 Design Occupancy	7
3.4 Travel Distances	8
3.5 Exit Provisions	8
3.5.1 Measurement of Exit Width at Doors	8
3.5.2 Building 1	9
3.5.3 Buildings 2-5	9
3.6 Inner Rooms	9
3.7 Vertical Means of Escape	10
3.7.1 Escape Stairs	10
3.7.2 Exits from Escape Stairs	10
3.7.3 Final Exits	10
3.7.4 Merging Flow	10
3.8 Disabled Means of Escape	10
3.8.1 Disabled Refuge Spaces	10
3.8.2 Evacuation Lifts	11
3.9 General Provisions	11
3.9.1 Height of Escape Routes	11
3.9.2 Door Fastening Devices	11
3.9.3 Direction of Opening	11
3.9.4 Sliding Doors	12
3.9.5 Automatic Doors	12

3.9.6 Exit Signs	12
3.9.7 Fire Protection of Lift Installation	12
4. Active Fire Safety Systems	13
4.1 Automatic Fire Detection & Alarm	13
4.1.1 Proposed Installation	13
4.1.2 Means of Alarm	13
4.1.3 Fire Alarm Interfaces	13
4.2 Fire Suppression	13
4.3 Emergency Lighting	13
4.4 Emergency Voice Communication	14
4.5 Emergency Power Supply	14
5. Internal Fire Spread – Linings	15
5.1 Performance of Walls and Ceilings	15
5.2 Thermoplastic Materials	15
6. Internal Fire Spread – Structure	16
6.1 Structural Fire Resistance	16
6.2 Compartmentation	16
6.2.1 Building 1	16
6.2.2 Buildings 2 – 5	16
6.2.3 Buildings 3 and 4 – Lower Ground Floor	17
6.3 Protected Stairs	17
6.4 Places of Special Fire Hazard	17
6.5 Concealed Spaces	17
7. External Fire Spread	18
7.1 External Surfaces of Walls	18
7.2 External Wall Construction	18
7.3 Unprotected Areas	18
8. Access and Facilities for the Fire Service	19
8.1 Hydrant Provisions	19
8.2 Fire Service Access	19
8.2.1 Building 1	19
8.2.2 Buildings 2 – 5	19
8.3 Access Routes for Fire Tenders	19
8.4 Basement Smoke Ventilation	20
9. Fire Safety Management	21
9.1 Statutory Obligations for Building Management	21
9.2 Fire Safety Management Procedures	21

10. Information, Limitations, and Assumptions	22
10.1 Drawings	22
10.2 Building Regulations	22
10.3 Other Limitations	22
11. References	23

List of Figures

Figure 1: Proposed Site Location.....	1
Figure 2: Measurement of Exit Width	9
Figure 3: Provisions for Escape Lighting.....	14
Figure 4: Table 9.1 of ADB - Maximum Dimensions of Cavities in Buildings	17
Figure 5: Fire Tender Access Routes	20

List of Tables

Table 1: Fire Strategy Summary	2
Table 2: Declaration of Compliance	3
Table 3: Design Occupancy	7
Table 4: Surface Classification for Walls and Ceilings	15
Table 5: Schedule of Drawings	22

1. Introduction

1.1 Objective of Report

The objective of this report is to support the planning application and outline the strategic approach taken to demonstrate compliance with Part B *Fire Safety* of the Building Regulations 2010 (as amended) [1] for the proposed development at the former MSD facility, Breakspear Road South, Ickenham.

This report will provide a summary on the key aspects of fire safety, which correlate with the corresponding recommendations in London Plan Policy D12 [2].

1.2 Project Description

The proposed works include the refurbishment and internal extension of an existing storage building to provide office accommodation, and the construction of four new warehouses.

The office building (Building 1) will include meeting and amenity accommodation at Ground Floor and desk seating and meeting room accommodation at First Floor. The upper floor will be served by two protected stairs which discharge directly to outside at Ground Floor.

Building 2 will be utilised for storage and warehousing purposes. It will comprise two floors and the upper floor will be served by three protected stairs.

Building 3 and Building 4 will each be utilised for storage and warehousing purposes. Both buildings will be located on sloping sites in which level egress is achievable from either Lower Ground or Upper Ground Floor.

Building 5 will also be utilised for storage and warehousing purposes. Building 5 will be single storey and will be provided with multiple exits around its perimeter.

The proposed scheme is located at the former MSD facility, Breakspear Road South, Ickenham. An overview of the site is indicated in Figure 1.

Figure 1: Proposed Site Location



1.3 Fire Strategy Summary

Table 1 summarises the key fire safety items that have been duly considered as part of the Planning Fire Safety Strategy (PFSS).

Table 1: Fire Strategy Summary

Section of Report	Description
3 - Means of Escape	<ul style="list-style-type: none"> Evacuation strategy: Simultaneous evacuation on confirmed alarm. Design occupancy: <ul style="list-style-type: none"> Building 1: 201 Building 2: 55 Building 3: 56 Building 4: 56 Building 5: 17 Travel distances: Travel distances will comply with ADB recommendations. Exit provisions: <ul style="list-style-type: none"> Building 1: <ul style="list-style-type: none"> Ground Floor: $2 \times \geq 1,050\text{mm}$ clear width storey/final exits First Floor: $2 \times \geq 850\text{mm}$ clear width storey exits Buildings 2-5: Each exit will achieve a minimum clear width of 850mm. Escape stairs: <ul style="list-style-type: none"> Building 1: $2 \times \geq 1,000\text{mm}$ clear width escape stairs Buildings 2-4: $\geq 850\text{mm}$ clear width escape stairs Evacuation lift: An evacuation lift will be provided within Building 1 (see Section 3.8.2).
4 - Active Fire Safety Systems	<ul style="list-style-type: none"> Fire detection and alarm system: As a minimum, a Type M standard of fire detection and alarm, designed and installed in accordance with BS5839-1, will be provided in each building. Emergency Lighting: Escape routes will be provided with emergency lighting complying with the relevant recommendations in Table 5.1 of ADB and BS5266-1. Emergency Voice Communication System(s): An emergency voice communication system will be incorporated which will provide a two-way communication link from each disabled refuge area to the proposed evacuation control point in each building.
5 - Internal Fire Spread – Linings	<ul style="list-style-type: none"> Internal linings will comply with Table 4 of this Planning Fire Safety Strategy.
6 - Internal Fire Spread – Structure	<ul style="list-style-type: none"> Structural Fire Resistance: <ul style="list-style-type: none"> Building 1: New elements of structure will achieve at least 30mins fire resistance (FR). Buildings 2-5: Elements of structure will achieve at least 60mins FR. Technical justification is provided in Section 6.2.3 for the proposal to not compartment the Upper Ground Floor from the Lower Ground Floor in Buildings 3 and 4. Where provided, protected stairs will be separated from adjacent accommodation by at least 30mins FR. Places of special fire hazard will be separated from adjacent accommodation by at least 30mins FR.

Section of Report	Description
7 - External Fire Spread	<ul style="list-style-type: none"> External surfaces: Based on building heights less than 18m above ground level and the elevations being located 1m or more from the relevant boundary, ADB would not place any restrictions on the external surfaces of the walls. External wall construction: Based on top storey heights less than 18m above ground level, there would be no prescriptive guidance in support of the Building Regulations that would require any insulation product, filler materials, etc., used in the external wall construction to achieve Class A2-s3, d2 or better. Unprotected Areas: A detailed external fire spread analysis, based on the recommendations of BR187, will be carried out and presented in the detailed Fire Strategy Report. Where applied fire protection is required, it will achieve at least 60mins FR for integrity (reduced to 30mins FR for Building 1) and 15mins FR for insulation, provided from inside only.
8 - Access and Facilities for the Fire Service	<ul style="list-style-type: none"> Fire service access: Based on internal floor areas less than 2,000m², each building will be provided with access for a pump appliance to at least 15% of its perimeter. Basement smoke ventilation: Buildings 3 and 4 will be located on sloping sites causing the Lower Ground Floor to be considered as a basement. The Lower Ground Floor in each case will be provided with means of venting smoke via the access doors (opening directly to external air).

The remainder of this Planning Fire Safety Strategy provides further detail on the various aspects of fire safety design which are considered to comply with the functional requirements of Part B *Fire Safety* of the Building Regulations 2010 (as amended) and meet the requirements of London Plan Policy D12 (where applicable).

1.4 Declaration of Compliance

This PFSS is considered to comply with the relevant legislation and meet the recommendations of London Plan Policy D12, where applicable.

Table 2: Declaration of Compliance

Declaration of Compliance	
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Reviewed by:	Kyle Adams BSc (Hons) MSc MIEI AlFireE 
Approved by:	James Keenan PhD MEng MSc AlFireE 

2. Legislation and Guidance

2.1 The London Plan

2.1.1 Overview of Policy D5 and D12

The London Plan is a spatial development strategy setting out an economic, environmental, transport and social framework for the development of London. The plan promotes inclusive design and fire safety through Policy D5 and Policy D12 respectively.

Policy D5 'Inclusive Design' states that, '*the buildings should be designed and built to accommodate robust emergency evacuation procedures for all building users, including those who require level access. All building users should be able to evacuate from a building with dignity and by as independent means as possible.....The installation of lifts which can be used for evacuation purposes (accompanied by a management plan) provide a dignified and more independent solution. The fire evacuation lifts, and associated provisions should be appropriately designed, constructed, and include the necessary controls suitable for the purposes intended'*

The London Plan Policy D12 'Fire Safety' states that, '*in the interests of fire safety and to ensure the safety of all building users, all development proposals must achieve the highest standards of fire safety and ensure that they:*

1. *identify suitably positioned unobstructed outside space:*
 - a. *for fire appliances to be positioned on*
 - b. *appropriate for use as an evacuation assembly point*
2. *are designed to incorporate features which reduce the risk to life and the risk of serious injury in the event of a fire; including appropriate fire alarm systems and passive and active fire safety measures*
3. *are constructed in an appropriate way to minimise the risk of fire spread*
4. *provide suitable and convenient means of escape, and associated evacuation strategy for all building users*
5. *develop a robust strategy for evacuation which can be periodically updated and published, and which all building users can have confidence in*
6. *provide suitable access and equipment for firefighting which is appropriate for the size and use of the development.'*

2.1.2 Proposed Fire Strategy

The D12 'Fire Safety' policy requests that all major development proposals should be submitted with a fire statement, which is an independent fire strategy, produced by a third party suitably qualified assessor.

The statement should detail how the development proposal will function in terms of:

1. *the building's construction: methods, products and materials used, including manufacturers' details*
2. *the means of escape for all building users: suitably designed stair cores, escape for building users who are disabled or require level access, and associated evacuation strategy approach*
3. *features which reduce the risk to life: fire alarm systems, passive and active fire safety measures and associated management and maintenance plans*
4. *access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and positioning of equipment, firefighting lifts, stairs, and lobbies, any fire suppression and smoke by ventilation systems proposed, and the ongoing maintenance and monitoring of these*

5. *how provision will be made within the curtilage of the site to enable fire appliances to gain access to the building*
6. *ensuring that any potential future modifications to the building will take into account and not compromise the base build fire safety/protection measures.*

With regards to each of the items listed above, the proposed scheme will be developed using the latest design guidance available to demonstrate compliance with Part B *Fire Safety* of the Building Regulations 2010 which will consider the key aspects as detailed above.

The Fire Strategy Report that will be used to demonstrate compliance with the Building Regulations will be developed based on the strategic approach outlined in this report. This report will provide the performance standards required for fire safety with respect to the construction of the buildings, methods, products, and performance of materials to be used; see Section 7.2 for information regarding the external walls.

The evacuation strategy with regards to means of escape including escape route widths, stair capacities and disabled evacuation, for Policy D5, are presented in Section 3 of this report.

Active fire safety systems proposed are outlined in the active fire safety systems section (Section 4) and passive fire safety provisions are presented throughout this report where applicable, e.g. principally within the internal fire spread section (see Section 6).

External Fire Spread and External Wall construction considerations are outlined Section 7.

Firefighting access provisions and facilities for firefighting operations including water supplies are presented in the relevant sections, i.e. access and facilities for the Fire Service (see Section 8).

With regards to building management and evacuation responsibilities, an overview is presented in the Fire Safety Management section of this report (see Section 9).

2.2 The Building Regulations 2010 (As Amended)

The Building Regulations 2010 (as amended) lay down performance requirements, which must be achieved in building construction, including Part B *Fire Safety*.

It is understood that Building 1 was originally used for storage purposes with ancillary office accommodation. The proposed works will result in the building being used as an office throughout. On this basis, the proposed works would be defined as 'material alterations' within an existing building, for the purpose of compliance with the Building Regulations 2010 (as amended). Therefore, any new works in Building 1 will comply in full with Part B of the Building Regulations 2010 (as amended) and existing areas will be made 'no less satisfactory' by virtue of the proposed works.

Buildings 2-5 (inclusive) will be newly constructed. Therefore, these new works must comply in full with the Building Regulations 2010 (as amended), including Part B *Fire Safety*.

Regarding fire safety, Approved Document B – Volume 2 *Buildings other than Dwellinghouses* (as amended) [3] (ADB) provides guidance on how to meet the requirements of the Building Regulations in most cases. However, ADB does not represent the only method which can be used to achieve compliance with the Regulations. ADB states the following in this regard:

'Fire safety engineering might provide an alternative approach to fire safety. Fire safety engineering may be the only practical way to achieve a satisfactory standard of fire safety in some complex buildings that contain different uses... Fire safety engineering may also be suitable for solving a specific problem with a design that otherwise follows the provisions in this document.'

Section 0.18 of ADB – Fire Safety Engineering

In complex or bespoke schemes, a standard approach will not always provide a satisfactory fire strategy. Therefore, where the proposed scheme does not fully comply with the recommendations of ADB, it is intended to incorporate the latest fire safety guidance available as part of an alternative fire engineered approach. This

approach will be based on the guidance of BS7974 [4] with the overarching aim of achieving a satisfactory design solution and Building Regulations approvals.

2.3 Purpose Group Classification

Building 1 will be refurbished and used for office accommodation purposes. Therefore, the appropriate purpose group classification is Purpose Group 3 *Office*.

Buildings 2, 3, 4 and 5 will be predominantly used for storage purposes. On this basis, the appropriate purpose group classification for each of these buildings is Purpose Group 7(a) *Storage and other non-residential*.

2.4 Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order 2005 (RRO) in England and Wales [5] imposes a general duty to take such fire precautions as may be reasonably required to ensure that the premises are safe for the occupants and those in the immediate vicinity. This places an onus on the management of the building to carry out risk assessments of the fire precautions during its operational life, i.e. a self-assessment regime, and to have robust fire safety management procedures in place.

Generally, compliance can be achieved with robust maintenance, staff training and housekeeping regimes and by undertaking regular fire risk assessments.

The local Fire and Rescue Service is responsible for enforcing these Regulations.

3. Means of Escape

3.1 Evacuation Strategy

The evacuation strategy for each building will be based on simultaneous evacuation upon confirmed alarm with escape routes from the buildings sized on this basis.

This does not preclude the use of an investigation period on the fire alarm systems to allow management to ascertain the authenticity of an initial alert. As part of the management of health and safety procedures the operator should prepare and implement procedures for the safe evacuation of all occupants from the building.

Fire Safety Management is discussed further in Section 9.

3.2 Assembly Points

Sufficient space will be allocated remote from each building to allow occupants to muster following evacuation in a fire event.

Each assembly point will be sufficiently remote from the building so that occupants are not at risk from falling debris from a building façade. The assembly points will also be positioned so they do not obstruct access for the Fire Service.

3.3 Design Occupancy

Floor space factors are generally used to assess the required capacity of escape routes in speculative buildings. When a designated bespoke occupancy is not known, there are varying recommended floor space factors in current guidance documents. However, standard fire safety guidance documents acknowledge where bespoke occupancy figures are available these can be applied. This approach is recommended in ADB.

The design occupancy has been based on furniture layouts (where known) and by applying floor space factors (in accordance with Table D1 of ADB). This is summarised in Table 3.

Table 3: Design Occupancy

Building	Floor	Location	Floor Area (m²)	Floor Space Factor (m²/person)	Occupancy
1 (Office)	Ground	Canteen	-	No. Seats	101
		Meeting Rooms	-	No. Seats	32
		Kitchen	29	7	5
		Total Ground Floor Occupancy:			
	First	Meeting Room	-	No. Seats	12 ^[1]
		Private Booths	-	No. Seats	4 ^[1]
		Office	-	No. Seats	63
		Total First Floor Occupancy			
		Total Building 1 Occupancy			
	2 (Warehouse)	Ground	Storage Area	799	30
		First	Storage Area	830	30
		Total Building 2 Occupancy			
3 (Warehouse)	Ground	Storage Area	826	30	28
	First	Storage Area	826	30	28

Building	Floor	Location	Floor Area (m ²)	Floor Space Factor (m ² /person)	Occupancy
			Total Building 3 Occupancy		56 [2]
4 (Warehouse)	Ground	Storage Area	826	30	28
	First	Storage Area	826	30	28
			Total Building 4 Occupancy		56 [2]
5 (Warehouse)	Ground	Storage Area	510	30	17
			Total Building 5 Occupancy		17 [2]

Note 1: The Meeting Room and Private Booths will be mutually exclusive with the Office at First Floor, i.e. both areas should not be occupied to capacity simultaneously. Therefore, the design occupancy in these areas has not been included in the total design occupancy of the floor.

Note 2: The ancillary accommodation, e.g. welfare facilities, will be mutually exclusive with the storage areas, i.e. both areas should not be occupied to capacity simultaneously. Therefore, the design occupancy in these areas has not been included in the total design occupancy of the building.

3.4 Travel Distances

ADB recommends the following maximum travel distances depending on use:

- Office:
 - 18m in a single direction; and
 - 45m where alternatives are available.
- Storage (Normal Hazard):
 - 25m in a single direction; and
 - 45m where alternatives are available.
- Storage (Higher Hazard):
 - 12m in a single direction; and
 - 25m where alternatives are available.

There is potential for warehouse buildings 2 - 5 to be utilised for the storage of diesel, propane/gas, and paint along with thinners for cleaning paint guns on site. On this basis, they have been treated as 'higher hazard' in this Planning Fire Safety Strategy.

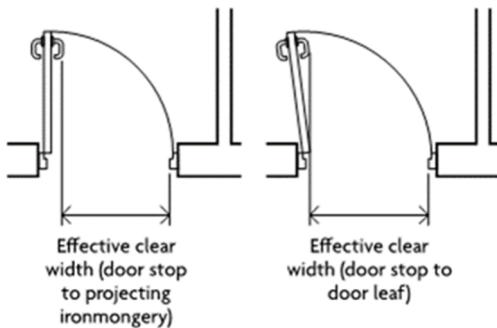
Travel distances in each building will comply with ADB recommendations.

3.5 Exit Provisions

3.5.1 Measurement of Exit Width at Doors

The method of measurement of exit widths is shown in Figure 2. The necessary exit width measurements noted for the scheme will be based on this approach.

Figure 2: Measurement of Exit Width



3.5.2 Building 1

3.5.2.1 Ground Floor

The total design occupancy on the Ground Floor of Building 1 is 138.

The Ground Floor will be provided with two primary storey/final exits, i.e. a storey exit opening into the North-west Stair and a final exit at the main entrance. Each exit will achieve a minimum clear width of 1050mm and will open in the direction of escape.

The exit opening direct to outside from the kitchen will achieve a minimum clear width of 850mm.

The door connecting the Canteen to the Entrance will achieve a minimum clear width of 850mm and will be double swing.

3.5.2.2 First Floor

The design occupancy on the First Floor is 63.

The First Floor is provided with two storey exits which open into their respective stair cores. Each exit will achieve a minimum clear width of 850mm to adequately accommodate the design occupancy. Each exit will open in the direction of escape.

3.5.3 Buildings 2-5

Exit provisions in storage buildings are generally driven by travel distance requirements rather than exit capacity requirements given the relatively low numbers of occupants who could be in these spaces. This is the case for buildings 2-5 where the total design occupancy in each instance will not exceed 60.

Storey/final exits will be located to ensure travel distances are compliant with standard guidance recommendations. Where provided, each exit will achieve a minimum clear width of 850mm and will open in the direction of escape, where practicable.

3.6 Inner Rooms

There are several inner room arrangements in the proposed scheme, particularly in Building 1. Where inner room arrangements occur, one of the following provisions will be provided:

- The enclosures (walls or partitions) of the inner room will stop a minimum of 500mm below the ceiling.
- A 0.1m² vision panel will be incorporated in the wall or door of the inner room where it connects with the access room.
- The access room will be provided with automatic smoke detection.

3.7 Vertical Means of Escape

3.7.1 Escape Stairs

3.7.1.1 Building 1

The First Floor of the office accommodation in Building 1 is served by two protected escape stairs. Based on discounting one stair due to fire, each stair will achieve a minimum clear width of 1,000mm, measured between walls and balustrades. Handrails can impinge up to 100mm into this width.

3.7.1.2 Buildings 2-4 (Inclusive)

Similar to the recommendations in Section 3.5.3, the escape stair provisions within each building will be driven by a necessity to comply with travel distance recommendations rather than escape capacity requirements.

Building 2 will be provided with three protected escape stairs. Each stair will achieve a minimum clear width of 850mm, i.e. each stair will be at least as wide as the storey exit opening into it.

Buildings 3 and 4 will be provided with one protected escape stair each. Each stair will achieve a minimum clear width of 850mm, i.e. each stair will be at least as wide as the storey exit opening into it.

The clear width will be achieved between walls and balustrades. Handrails can impinge up to 100mm into this width.

Wider stair widths could be required to comply with other aspects of the Building Regulations which are outside the scope of this report.

3.7.2 Exits from Escape Stairs

ADB recommends that every protected stair should lead to a final exit, either directly or via a protected exit passageway.

In Building 2, the protected escape stair will discharge at Ground Floor centrally. A protected exit passageway will be incorporated from the base of the stair to the final exit on the South-west Elevation. The protected exit passageway will achieve at least 30mins fire resistance (FR).

3.7.3 Final Exits

Final exits will be unambiguously marked by appropriate signage and will ensure the effective evacuation of occupants away from the building to a place of safety.

Final exits will be at least as wide as the required escape routes that they serve.

3.7.4 Merging Flow

For a given fire scenario, occupants at Ground Floor in Building 1 will potentially have to merge with the base of the North-west escape stair serving the upper floor. The final exit from the stair is located less than 2m from the base of the stair and the storey exit. Therefore, for compliance with ADB it would be necessary to combine the minimum clear width of the stair with the storey exit clear width, i.e. 1,050mm + 1,000mm = 2,050mm.

However, given that the overall design occupancy using the final exit is less than 220, i.e. less than the capacity of a 1050mm clear width exit, the provision of a 1050mm clear width final exit is considered to be reasonable. Technical justification for this arrangement will be provided in the detailed Fire Strategy Report.

3.8 Disabled Means of Escape

3.8.1 Disabled Refuge Spaces

Areas to which occupants with disabilities are afforded access, and a change in level occurs along their route to a point of safety outside the building, will be provided with a disabled refuge space located within a protected enclosure, e.g. a protected stair or protected lobby.

Refuge spaces will comply with the relevant recommendations in Clause 3.4 – 3.9 (inclusive) of ADB and have minimum dimensions of 900mm x 1400mm. Where disabled refuge spaces are provided, they will not impinge on the minimum required escape route widths.

Management procedures should be developed to ensure the safety of all occupants in a fire emergency, including disabled occupants. Staff should be trained in procedures incorporating the evacuation of occupants who require assistance.

3.8.2 Evacuation Lifts

Evacuation lifts are not a requirement for Building Regulations compliance. However, Policy D5(B5) of the London Plan notes the following:

'In all developments where lifts are installed, as a minimum at least one lift per core (or more subject to capacity assessments) should be a suitably sized fire evacuation lift suitable to be used to evacuate people who require level access from the building.'

Buildings 2-4 will not incorporate lift access to the upper floors. Therefore, the provision of an evacuation lift in each of these buildings is not considered necessary for compliance with Policy D5 of the London Plan. However, one of the existing stairs in Building 1 incorporates a lift. It is proposed that this lift will be refurbished/replaced to incorporate a lift which is suitable for evacuation purposes. The existing building did not make provision for a lift adjacent to the North-west Stair. Given that the proposed works will only entail a refurbishment of the existing building it is not proposed to incorporate an evacuation lift adjacent to this existing stair. However, the stair will be provided with a disabled refuge and staff will be appropriately training in carry-down procedures.

The evacuation lift in Building 1 will be designed and installed in accordance with the relevant recommendations in BS EN 81-20 [6] and BS EN 81-70 [7]. A secondary power supply will be provided to the lift.

3.9 General Provisions

3.9.1 Height of Escape Routes

All escape routes will have a clear head height of not less than 2m with no projections below this height, except for door frames at doorways.

3.9.2 Door Fastening Devices

Where doors on escape routes are required to be lockable, they will only be fitted with a simple fastening device not involving the use of a key or more than one mechanism that can be easily operated from the side of escape.

Secure doors provided with electrically powered locks will return to the unlocked position as follows:

- on operation of the fire detection and alarm system;
- on loss of power or system error; and
- on activation of the security override (i.e. Type A) conforming to BS 7273-4 [8] located on the side of escape.

3.9.3 Direction of Opening

Doors will open in the direction of escape, i.e. outward opening, where the door provides escape for more than 60 occupants or if it is from an area where there is a very high risk of fire with potential for rapid fire growth. N.B. All storey/final exits from Buildings 2-5 (inclusive) will open in the direction of escape.

All doors on escape routes will open through not less than 90° and swing clear of any changes in floor level. The swing of doors which open onto corridors will not reduce the minimum required width of the escape routes along the corridors.

3.9.4 Sliding Doors

The doors serving the 4no. private booths around the main meeting room on the First Floor of Building 1 form part of the escape routes from these rooms.

BS9999 recommends that sliding doors, automatic or manual, are generally an unacceptable means of escape, unless they are designed to fail open or be easily broken open from any position throughout their operating parameters. Where these doors are incorporated, they will be designed in accordance with BS7273-4.

3.9.5 Automatic Doors

Where automatic doors are provided on an escape route, they will comply with one of the following:

1. They are automatic doors of the required width and comply with one of the following conditions:
 - a. they will be arranged to fail safely to outward opening from any position of opening;
 - b. they will be provided with a monitored failsafe system for opening the doors if the mains supply fails; or
 - c. they will fail safely to the open position in the event of power failure.
2. non-automatic swing doors of the required width will be provided immediately adjacent to the automatic door.

3.9.6 Exit Signs

Every doorway or other exit providing access to a means of escape, other than exits in ordinary use (e.g. main entrances), will be distinctively and conspicuously marked by an exit sign in accordance with BS ISO 3864-1 [9] and BS 5499-4 [10].

3.9.7 Fire Protection of Lift Installation

The lift machine room will be sited over the lift well, where possible.

4. Active Fire Safety Systems

4.1 Automatic Fire Detection & Alarm

4.1.1 Proposed Installation

As a minimum, a Type M standard of fire detection and alarm, designed and installed in accordance with BS5839-1 [11], will be provided within each building.

Any requirements for further automatic fire detection in each building will be dependent on internal fit-out arrangements.

4.1.2 Means of Alarm

The mode of alarm will be in line with BS 5839-1 and will take account of the following:

- the alarm system will include audible sounders adequately located throughout each building to alert all occupants; and
- flashing beacons will be provided where there would be potential for lone occupants and high background noise levels.

4.1.3 Fire Alarm Interfaces

The fire alarm systems will need to be coordinated with the building management systems, mechanical, electrical and security systems. The items below represent the strategic interface items for the fire alarm systems, but it is not intended to be exhaustive:

- Where electro-magnetic hold open devices are provided on fire doors that need to be held open for business operations, they will comply with the recommendations of BS7273-4; these devices will disengage on activation of the fire alarm system.
- Any electronic locking systems on doors across escape routes will disengage on activation of the fire alarm system. Manual override facilities will also need to be provided as per the recommendations of BS7273-4.
- Control devices will be provided to shut off audio systems that might otherwise interfere with the operation of the fire alarm system.

Full details of the fire alarm interfaces will be provided in the cause-and-effect schedule for the fire alarm system.

4.2 Fire Suppression

For compliance with ADB, the provision of an automatic sprinkler system would not be essential from a life safety perspective as each building's top storey height is located less than the threshold height above ground level. The fire strategy for each building has been developed based on sprinklers not being provided.

4.3 Emergency Lighting

In addition to adequate artificial lighting, each building will need to be provided with an escape lighting system with coverage to both internal and external escape routes. The system will need to illuminate the escape routes during failure of the main supply.

Emergency lighting, where required, will be provided in accordance with Table 5.1 of ADB (replicated below in Figure 3) and BS5266-1 [12].

Figure 3: Provisions for Escape Lighting

Use of the building or part of the building	Areas requiring escape lighting
Residential	All common escape routes ¹⁾ , except in two storey blocks of flats
Office, industrial, storage and other non-residential	<ul style="list-style-type: none"> a. Underground or windowless accommodation b. Stairs either: <ul style="list-style-type: none"> • in a central core • that serve storey(s) more than 18m above ground level c. Internal corridors more than 30m long d. Open-plan areas of more than 60m²
Shop and commercial, and car parks	<ul style="list-style-type: none"> a. Underground or windowless accommodation b. Stairs either: <ul style="list-style-type: none"> • in a central core • that serve storey(s) more than 18m above ground level c. Internal corridors more than 30m long d. Open-plan areas of more than 60m² e. All escape routes (other than the following exception) to which the public are admitted.¹⁾ The exception is shops that meet all of the following: <ul style="list-style-type: none"> • have a maximum of three storeys • have no sales floor of more than 280m² • are not a restaurant or bar
Assembly and recreation	<ul style="list-style-type: none"> a. All escape routes¹⁾ b. Accommodation except for that which is open on one side to view sport or entertainment during normal daylight hours
Any purpose group	<ul style="list-style-type: none"> a. All toilet accommodation with a minimum floor area of 8m² b. Electricity and generator rooms c. Switch room/battery room for emergency lighting system d. Emergency control rooms
NOTE:	
1. Including external escape routes.	

Escape stair lighting will be on a separate circuit from the electricity supply to any other part of the escape route.

4.4 Emergency Voice Communication

An emergency voice communication (EVC) system (complying with BS5839-9 [13]) will be incorporated where disabled refuges are provided and it will provide a two-way communication link from each disabled refuge area to the proposed evacuation control point, normally adjacent to the each building's main fire alarm panel.

4.5 Emergency Power Supply

The design of all life safety systems will be undertaken to ensure there are failsafe provisions.

This includes the provision of an emergency power supply to all life safety systems including the emergency lighting system, the automatic fire detection and alarm system, evacuation lift, etc.

5. Internal Fire Spread – Linings

5.1 Performance of Walls and Ceilings

The surface linings of new walls and ceilings will have a classification not lower than the relevant class given in Table 4.

Table 4: Surface Classification for Walls and Ceilings

Location ^[1]	Classification
Rooms not exceeding 30m ²	D-s3, d2
Other rooms	C-s3, d2
Circulation spaces	B-s3, d2

Note 1: For the purposes of Internal Fire Spread, a room is defined as an enclosed space within a building that is not solely used as a circulation space.

Where linings are provided in rooms, any part of the surface of a wall can be of one lower performance classification than that noted in Table 4, but no worse than class D-s3, d2, if the total area does not exceed the lesser of either:

- half the floor area of the room; or
- 60m²

The classifications noted above are not applicable to fitted furniture, doors and door frames, window and roof light frames, architraves, skirting, exposed beams, and similar narrow members.

5.2 Thermoplastic Materials

Any thermoplastic materials will be in accordance with Clauses 6.13 to 6.18 (inclusive) of ADB.

6. Internal Fire Spread – Structure

6.1 Structural Fire Resistance

ADB recommends that a fire resistance (FR) period should be provided to the following elements of structure:

- Structural frame, beams, or columns (exposed faces)
- Loadbearing walls (each side separately)
- Compartment walls/floors (each side separately/from the underside)
- External walls, where protection against external fire spread is required (see Section 7)
- Floors (from the underside)
- Protected shafts, e.g. stair cores, lift shafts, service risers, etc. (each side separately)

ADB notes that structural elements that support only the roof of a building do not require fire resistance except where a roof also performs the function of a floor, i.e. forms part of an escape route from some other accommodation, or functions as a floor such as a car park, or the roof also supports other fire-resisting portions of structure (e.g. external walls that need fire resistance for external fire spread purposes). This does not mean that an infrequently accessed roof area for plant/maintenance purposes requires fire resistance if none of the other provisions apply.

Where one element of structure supports or gives stability to another element of structure, the FR of the supporting element or component will not be less than the minimum period of FR for the other element.

The top storey of Building 1 is located less than 5m above the lowest adjacent ground level. On this basis new elements of structure, which are required to be fire-resisting, will achieve at least 30mins FR. Existing structural elements will be made no less satisfactory by virtue of the proposed works. Any notable deficiencies will be made good.

Based on top storey heights less than 5m above the lowest adjacent ground level, elements of structure, which are required to be fire-resisting, in buildings 2 – 5 (inclusive) will achieve at least 60mins FR.

Buildings 3 and 4 will be located on sloping sites and the front and rear elevations will provide access to two different floor levels, i.e. a Lower Ground and Upper Ground Floor. By virtue of the Lower Ground Floor (in each case) being located more than 1.2m below the highest adjacent ground level, it would strictly be defined as a basement. Based on at least one side of each basement being open at ground level, ADB notes that the fire resistance period applied to structure above ground level can also be provided to the Lower Ground Floor, i.e. the 60mins FR need not be increased.

6.2 Compartmentation

6.2.1 Building 1

ADB does not place a restriction on the total internal floor area of office accommodation. Therefore, additional sub-dividing compartmentation will not be required in Building 1 for compliance with ADB.

6.2.2 Buildings 2 – 5

In multi-storey scenarios, i.e. Buildings 2 – 4, where the building height is less than 18m above ground level ADB recommends that the total compartment volume in a storage building should be limited to 20,000m³. The total compartment volume in each building is significantly less than 20,000m³. Therefore, it would not be necessary to incorporate additional sub-dividing compartmentation.

In single storey scenarios (with a building height less than 18m above mean ground level), ADB recommends that the total compartment floor area should be limited to 20,000m². The total floor area in Building 5 is

significantly less than 20,000m². Therefore, it would not be necessary to incorporate additional sub-dividing compartmentation.

6.2.3 Buildings 3 and 4 – Lower Ground Floor

As noted in Section 6.1, Buildings 3 and 4 will be located on sloping sites and the front and rear elevations will provide access to different floor levels, i.e. a Lower Ground and Upper Ground Floor. The Lower Ground Floor (in each case) would be defined as a basement. For compliance with ADB, the Upper Ground Floor should be constructed as a compartment floor. In this instance, this is considered to be unduly onerous given the extent of access at grade at both levels, i.e. the same firefighting difficulties presented by a landlocked basement arrangement should not be encountered. On this basis, it is proposed to not construct the Upper Ground Floor as a compartment floor in each case. Technical justification for this arrangement will be provided in the detailed Fire Strategy Report.

6.3 Protected Stairs

Where provided, protected escape stairs will be separated from adjacent accommodation by at least 30mins FR and FD30S self-closing fire doors.

6.4 Places of Special Fire Hazard

ADB recommends that areas defined as a place of special fire hazard, e.g. oil-filled transformer rooms, switch gear rooms, boiler rooms, storage space for fuel or other highly flammable substance(s) and rooms housing fixed internal combustion engines, etc., should be enclosed in at least 30mins FR and provided with FD30 fire doors.

Places of special fire hazard will be enclosed in at least 30mins FR and provided with FD30 fire doors.

6.5 Concealed Spaces

To prevent concealed fire and smoke spread, voids of significant dimensions will be subdivided. Cavity barriers will be provided in line with the recommendations in Section 9 of ADB.

Typically, this will be around openings and at 20m intervals in larger concealed spaces where the surface spread of flame classification for linings in the space is Class C-s3, d2 or better. For lower lining classifications, the distance between cavity barriers will be reduced to 10m.

Figure 4 indicates ADB recommendations regarding the maximum dimensions of cavities.

Figure 4: Table 9.1 of ADB - Maximum Dimensions of Cavities in Buildings

Table 9.1 Maximum dimensions of cavities in buildings other than dwellings (purpose groups 2 to 7)

Location of cavity	Class of surface/product exposed in cavity (excluding the surface of any pipe, cable or conduit, or any insulation to any pipe)	Maximum dimension in any direction (m)
Between roof and a ceiling	Any	20
Any other cavity	Class C-s3, d2 or better	20
	Worse than Class C-s3, d2	10

7. External Fire Spread

7.1 External Surfaces of Walls

Based on the relevant boundaries being located at least 1m from each building elevation, ADB would not place restrictions of the external surfaces of the elevations.

7.2 External Wall Construction

ADB recommends that in a building with a storey 18m or more in height any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar), etc., used in the construction of an external wall should be Class A2-s3, d2 or better.

Based on each building having a top storey height less than 18m above ground level, there would be no prescriptive guidance in support of the Building Regulations that would require any insulation product, filler materials, etc., used in the external wall construction to achieve Class A2-s3, d2 or better.

Where practicable, it is recommended that Class A2-s3, d2 or better insulation products, filler materials, etc., are used.

7.3 Unprotected Areas

A detailed external fire spread analysis, based on the recommendations of BR187 [14], will be carried out and presented in the detailed Fire Strategy Report.

Where applied fire protection is required, it will achieve at least 60mins FR for integrity (reduced to 30mins FR for Building 1) and 15mins FR for insulation, provided from inside only.

Unprotected areas which are outlined in Diagram 13.5 of ADB may be discounted.

8. Access and Facilities for the Fire Service

8.1 Hydrant Provisions

ADB recommends that where a building has a compartment of 280m² or more in floor area and is located more than 100m from an existing fire hydrant, additional hydrants should be provided to within 90m of an entry point to the building and not more than 90m apart.

Where existing fire hydrants are located within the requisite distances, it will be ensured that they provide adequate flows and pressures for effective firefighting.

Where new fire hydrants are incorporated, they will be designed and installed in accordance with the relevant recommendations in BS9990 [15].

8.2 Fire Service Access

8.2.1 Building 1

Fire tender access routes to Building 1 will be made no less satisfactory by virtue of the proposed works.

8.2.2 Buildings 2 – 5

Based on total internal floor areas less than 2,000m² and mean roof heights less than 11m above ground level, access for a pump appliance will be provided to at least 15% of each building's perimeter.

8.3 Access Routes for Fire Tenders

Fire tender access routes will be designed in accordance with the following criteria in ADB:

- Minimum width of road between kerbs - 3.7m
- Minimum width of gateways - 3.1m
- Minimum turning circle between kerbs - 16.8m
- Minimum turning circle between walls - 19.2m
- Minimum clearance height - 3.7m
- Minimum carrying capacity - 12.5t

Dead-end access routes longer than 20m require turning facilities.

Figure 5 below indicates the available access routes for a fire tender.

Figure 5: Fire Tender Access Routes



8.4 Basement Smoke Ventilation

ADB recommends that smoke outlets connecting directly to the open air should be provided from every basement storey except for any basement storey that has both of the following:

- a maximum floor area of 200m²; and
- a floor a maximum of 3m below the adjacent ground level.

ADB recommends that the smoke outlets should be sited at high level and evenly distributed around the perimeter. However, a basement storey or compartment containing rooms with doors or windows does not need smoke outlets.

Buildings 3 and 4 will be located on sloping sites. The Lower Ground Floor in each case will be provided with means of venting smoke via access doors.

9. Fire Safety Management

9.1 Statutory Obligations for Building Management

Although not expressly stated, good management is implicit in Part B of the Building Regulations 2010 and Approved Document B. Additionally, the RRO imposes a duty on the owner/occupier of premises to:

- maintain all means of escape from fire;
- secure the means of escape from fire;
- secure all firefighting equipment; and
- secure all means of giving warning of fire to the occupants.

Via the preparation of appropriate documentation, the fire safety management of the building will need to demonstrate that they can meet the obligations of the RRO. Matters relating to fire safety will form an integral part of such documentation.

9.2 Fire Safety Management Procedures

Detailed fire safety management procedures will need to be developed in consultation with the Statutory Authorities. A Fire Safety Management Plan for the buildings will need to be implemented and monitored by building management and should include the following key components:

- Fire Safety Management structure;
- actions to be taken in a fire emergency, including:
 - evacuation protocols reflecting the fire alarm system cause and effect schedule;
 - evacuation of occupants with physical, sensory and cognitive disabilities, an effective way of addressing this would be with individual Personal Emergency Evacuation Plans (PEEPs);
- housekeeping;
- maintenance of active and passive fire protection measures, e.g. fire alarm system, fire doors, compartmentation, etc;
- staff training;
- continuing control and audit procedures;
- security; and
- maintenance of Fire and Rescue Service access and facilities.

It should be noted that this section only serves as a brief introduction to the fire safety management procedures, which will need to be written into the Fire Safety Management Plan.

Further guidance can be found in BS9999 [16].

10. Information, Limitations, and Assumptions

10.1 Drawings

The drawings detailed in Table 5 were used in the development of this report.

Table 5: Schedule of Drawings

Drawing Number	Drawing Title	Drawing Revision
1381-DR-A-30-100	Proposed Site Plan	00
1381-DR-A-01-010	Proposed Building 1 Floor Plans	01
1381-DR-A-02-010	Proposed Building 2 Floor Plans	01
1381-DR-A-03-010	Proposed Building 3 Floor Plans	01
1381-DR-A-04-010	Proposed Building 4 Floor Plans	01
1381-DR-1-05-010	Proposed Building 5 Floor Plans	01
1381-DR-A-01-020	Proposed Building 1 Section	00
1381-DR-A-02-020	Proposed Building 2 Section	00
1381-DR-A-03-020	Proposed Building 3 Section	00
1381-DR-A-04-020	Proposed Building 4 Section	00
1381-DR-A-05-020	Proposed Building 5 Section	00
1381-DR-A-01-030	Proposed Building 1 Elevations	01
1381-DR-A-02-030	Proposed Building 2 Elevations	01
1381-DR-A-03-030	Proposed Building 3 Elevations	01
1381-DR-A-04-030	Proposed Building 4 Elevations	01
1381-DR-A-05-030	Proposed Building 5 Elevations	01

10.2 Building Regulations

This report considers life safety through the appropriate Building Regulations and London Plan Guidance.

This report does not specifically address property protection, business continuity or insurance issues.

It should not be assumed that following the guidance provided in this report confers approval in respect to any aspect of the design in advance of formal approval being received from the Statutory Authorities.

10.3 Other Limitations

Complying with the recommendations of this report will not guarantee that a fire will not occur.

Unless otherwise described in this report. The fire strategy assumes that the detailed design of the building construction and systems therein will comply with current Building Regulations and supporting guidance.

This Planning Fire Safety Strategy sets out the approach to be adopted in achieving satisfactory levels of fire safety within the building. The detailed design of the various fire safety installations, both active and passive, and the preparation of design drawings and specifications identifying such installations remain the responsibility of the respective design team members, e.g. services consultant and project Architect.

11. References

- [1] Crown copyright, *The Building Regulations 2010*, No. 2214, *Building and Buildings, England and Wales*. The Stationery Office, 2010.
- [2] Mayor of London, *The London Plan. The spatial development strategy for Greater London*. Greater London Authority, City Hall, The Queen's Walk, London, SE1 2AA, 2021.
- [3] HM Government, *Approved Document B: Fire Safety – Volume 2: Buildings other than dwellings (2019 edition incorporating 2020 and 2022 amendments)*. RIBA Books (Crown Copyright 2020), 2022.
- [4] British Standards Institution, *BS 7974:2019 Application of fire safety engineering principles to the design of buildings. Code of practice*. British Standards Institution, 2019.
- [5] Crown copyright, *The Regulatory Reform (Fire Safety) Order 2005*, No. 1541 - *Regulatory Reform, England and Wales*. The Stationery Office, 2005.
- [6] British Standards Institution, *BS EN 81-20:2020 Safety rules for the construction and installation of lifts. Lifts for the transport of persons and goods. Passenger and goods passenger lifts*. British Standards Institution, 2020.
- [7] British Standards Institution, *BS EN 81-70:2021+A1:2022 Safety rules for the construction and installation of lifts. Particular applications for passenger and goods passenger lift - Accessibility to lifts for persons including persons with disability*. British Standards Institution, 2022.
- [8] British Standards Institution, *BS 7273-4:2015+A1:2021 Code of practice for the operation of fire protection measures. Actuation of release mechanisms for doors*. British Standards Institution, 2021.
- [9] British Standards Institution, *BS ISO 3864-1:2011 Graphical symbols. Safety colours and safety signs. Design principles for safety signs and safety markings*. British Standards Institution, 2011.
- [10] British Standards Institution, *BS 5499-4:2013 Safety signs. Code of practice for escape route signing*. British Standards Institution, 2013.
- [11] British Standards Institution, *BS 5839-1:2017 Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*. British Standards Institution, 2017.
- [12] British Standards Institution, *BS 5266-1:2011 Emergency lighting. Code of practice for the emergency escape lighting of premises (Replaced by BS 5266-1:2016)*. British Standards Institution, 2011.
- [13] British Standards Institution, *BS 5839-9:2011 Fire detection and fire alarm systems for buildings. Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems (Replaced by BS 5839-9:2021)*. British Standards Institution, 2011.
- [14] R. Chitty, *BR 187, 2nd edition: External fire spread: building separation and boundary distances*. BREPress, 2014.
- [15] British Standards Institution, *BS 9990:2015 Non automatic fire-fighting systems in buildings. Code of practice*. British Standards Institution, 2015.
- [16] British Standards Institution, *BS 9999:2017 Fire safety in the design, management and use of buildings. Code of practice*. British Standards Institution, 2017.

Where this Fire Strategy Report refers to a named standard, the relevant version of the standard is listed above. However, if the version has been replaced or updated by the issuing body, the new version may be used, provided it continues to address the relevant requirements of the Building Regulations.

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