

Royal Elm Park

RIBA Stage 2 Fire Safety Strategy

Revision P02

S3 – Suitable for Review & Comment



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Prepared by:
Stantec Hydrock Limited

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Issued by	Stantec Hydrock Limited Great Suffolk Yard 127-131 Great Suffolk Street London SE1 1PP UNITED KINGDOM stantec.com	+44(0) 203 8468456 stantec.com
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Issue number	01	Name
Prepared by		Hamish Allan
Checked by		Andrew Kennedy
Issue number	02	Name
Prepared by		Sara Carvalho
Checked by		Andrew Kenedy
Approved by		Charles Betts

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Executive Summary

Building Description	The phase 5 of Royal Elm Park site is located in Reading. The development is comprised of two main high rise residential blocks annotated as the Southwest block and Northeast block. These two blocks contain private residential flats from the ground floor up to the sixth floor. The block of flats buildings are 7 storeys high each, (i.e., ground and six upper floors) plus a lower ground level. The building contains a lower ground floor that connects the two blocks that contains an underground car park and ancillary plant rooms. The site also contains six separate townhouses, with each considered a separate dwelling set out as two blocks of three at the Northwest and Southwest elevations sharing a common wall with the Northeast tower block. The roof levels of the two blocks are accessed for periodic maintenance for plant. For the purposes of this Fire Safety Strategy, the building height is considered to be 23.5m taken at the northwest elevation where the topography is most onerous. Refer to Section 1.4 for further detail.
Design Guidance and Legislation	The development is generally to be designed in accordance with BS 9991:2024 (including June 2025 Corrigendum) for all areas. All deviations from this guidance will require agreement with the approving authority and local Fire Service.
Fire Detection and Alarm System	It is proposed to install a Category LD1 fire detection and alarm system designed, installed, commissioned, and maintained in accordance with BS 5839-6:2010+A1 for the residential areas including both flats and townhouses. Within the common residential areas (lobbies, corridors and stairs) it is proposed to provide a Category L5 fire detection system design to activate the relevant smoke ventilation systems only (no sounders to be provided in these areas). This fire detection system is to be design, installed, commissioned and maintained in accordance with BS 5839-1:2025. The non-residential areas (ancillary areas and amenity areas) are proposed to be provided with a Category L3 (depending on their location) fire detection and alarm system designed, installed, commissioned and maintained in accordance with BS 5839-1:2025.

Smoke Ventilation	Protected Stairs (Section 3.2.1): All protected stairs serving upper floors of the development should be equipped with an Automatic Opening Vent (AOV) at the head of the stair, operated on smoke detection within the stair enclosure and a manual call point at the final exit from the stair. The AOV must have a minimum aerodynamic free area of not less than 0.7m² or 1.0m² free area. Common Corridors and Lobbies (Section 3.2.2): The corridors in the high-rise residential blocks that serve access and escape from residential units to the central protected lift lobbies are to be provided with mechanical smoke ventilation systems (MSVS) in accordance with subclause Annex F, F.5.1.4 of BS 9991:2024. The four natural smoke shafts specified per evacuation lift lobby are each to achieve a minimum cross-sectional free area of 1.5m² with a minimum dimension of 0.85m in any direction and meet the specifications detailed within BS 9991:2024, Annex F, Clause F.5.1.3. Ancillary Accommodation (Section 3.2.3): Ancillary accommodation accessed by the protected stairs and/or exit passageway should be approached only by way of a protected lobby/corridor having not less than 1m² of permanent ventilation, or an AOV with an aerodynamic-free area of not less than 0.7m². Alternatively, the permanent ventilation can be reduced to 0.4m² with the provision of a sprinkler system.
Automatic Water Fire	A Category 4 sprinkler system designed, installed, commissioned, and maintained in accordance with BS9251:2021 should be provided in all parts of the premises, with the exception of the areas as outlined in Section 5.4 of BS9251:2021. Refer to Section 3.3 for further information.
Evacuation Strategy	The evacuation strategy for the two high-rise residential blocks and townhouses is to be based on a 'stay-put' strategy, where only the occupants within the flat of fire origin are to be alerted/evacuated, and all other occupants within the building are to remain in place unless they are directly affected by fire or smoke or wish to do so. The high-rise residential blocks should be provided with an Evacuation Alert System (EAS) to allow the Fire and Rescue Service to activate evacuation alert sounders within individual flats, on multiple floors, or throughout the building, as necessary. The evacuation strategy for the non-residential areas is based on a single-stage simultaneous evacuation approach, where the activation of a manual call point or detector triggers an instantaneous warning from all fire alarm sounders within non-residential areas alone for immediate evacuation. See Section 4.2 for further information.



Provisions for Disabled Occupants	An emergency voice communication system (EVC) system allowing two-way communication should be provided to all evacuation lift lobbies. The EVC should conform to BS 5839-9:2021 and consist of Type B outstations which communicate with a master station located at a suitable control point at Fire and Rescue Service access level. At least one evacuation lift should be provided for each escape stairway, or more if required by capacity assessment, according with Section 7.4.1 of BS 9991:2024 and BS EN 81-20:2020 to provide disabled occupants with a dignified and independent means of escape. Given the expected number of occupants of the development and defined evacuation strategy, providing one evacuation lift per core is deemed adequate. Evacuation lifts are to follow the guidance of BS 81-76:2025 and BS EN 81—20:2020. The evacuation lifts are to be a Class B in the instance that the building is considered complex and a firefighting lift is also required in accordance with BS EN 81-76:2025. A class A lift is specified where: - the highest floor is such that a firefighter's lift would not be required, and - the evacuation strategy does not require more than one evacuation exit landing for the lift in question, and - the evacuation strategy does not require prioritization of evacuation lift service for specific landings, and - a secondary power supply is not available; the evacuation plan can accommodate an evacuation lift with an automatic rescue operation. Refer to Section 4.9 for further information.
Structural Fire Protection	Elements of structure throughout the building are to achieve at least 60 minutes fire resistance, with regard to load-bearing capacity. See Section 6.1 for further information. As PV panel arrays are being proposed for development, Stantec recommends the roof structure supporting PV panels to achieve at least REI 60 minutes resistance. See Section 6.1.1 for further information.
External Walls	As phase 5 of Royal Elm Park is higher than 18m above ground level and is considered a 'relevant building', Regulation 7(2) of the Building Regulations applies, all materials used in external walls or specified attachments must achieve a Class A2-s1, d0 or better classification, except for those exempted under Regulation 7(3). See Section 7.1 for further information.

Fire and Rescue Service Access and Facilities	The development is provided with Fire and Rescue Service vehicle access from the via the northeast corner of the site. The high-rise residential blocks will be provided with firefighting shafts containing firefighters' lifts, stairs, lobby and dry fire mains, as they contain floors higher than 18m above the fire service access level.
Areas to be Addressed by the Design Team	The following areas should be addressed by the design team at the next design stage: - A standby generator is currently proposed on the roof level of the southwest block. The design team are to confirm if this standby generator is provide means of secondary power for life safety systems. Should this be the case, the roof slab supporting this standby generator is considered to be supporting life safety plant and will be required to achieve 120 minutes REI fire resistance with exposure from the underside in accordance with BS 8519:2020, Section 6.3 (see Section 3.5). - The locations of fire main inlets and outlets within this strategy are indicative only and should be confirmed by the client and specialist designer (see Section 8.3.2).
Areas Subject to Agreement with the Approving Authorities and Local Fire and Rescue Service	The following areas are subject to agreement with the approving authorities and local Fire and Rescue Service: - A single non-compliant travel distance with respect to the guidance of BS 9991:2024 is present in the car park sprinkler tank room at the lower ground floor. However, Stantec consider it acceptable given the basis provided in the relevant section. Alternatively, a secondary means of escape may be provided from this room to achieve alignment with travel distance limitations as defined by guidance. See Section 4.4.6.1 for further information. - Within the Southwest block, the firefighters' stair and lift, and protected stair and evacuation lift discharge via an entrance lobby. This arrangement is considered acceptable provided that the fire load within the lobby is controlled (for example, by enclosing any post boxes within fire-rated enclosures). This arrangement remains subject to agreement with the Approving Authority and the local Fire and Rescue Service. See Section 4.5.5 for further information.



1 Introduction

Stantec have been engaged by RFC Prop Co Ltd to provide fire engineering services for the proposed Phase 5 of Royal Elm Park located in Reading.

1.1 Purpose of Report

The purpose of this report is to outline the Fire Safety Strategy to the design team and relevant stakeholders and demonstrate that the proposed development satisfies all functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulations 2010 (as amended) and

1.2 Basis of Report

This Fire Safety Strategy has been developed based on the information and drawings developed by Stantec, as outlined in Table 1.

Table 1 Information on which the fire safety strategy is based

Description	Drawing no.	Revision	Date
Overall Landscape General Arrangement	RG-LD-100	P01	05.09.25
Proposed Lower Ground Floor Plan	LN-A-SK100	P03	05.09.25
Proposed Ground Floor Plan	LN-A-SK101	P02	05.09.25
Proposed First Floor Plan	LN-A-SK102	P02	05.09.25
Proposed Second Floor Plan	LN-A-SK103	P02	05.09.25
Proposed Third Floor Plan	LN-A-SK104	P02	05.09.25
Proposed Fourth Floor Plan	LN-A-SK105	P02	05.09.25
Proposed Fifth Floor Plan	LN-A-SK106	P02	05.09.25
Proposed Sixth Floor Plan	LN-A-SK107	P02	05.09.25
Proposed Roof Plan	LN-A-SK108	P02	05.09.25
Proposed Elevations 1	LN-A-SK211	P02	20.05.25
Proposed Elevations 2	LN-A-SK212	P02	20.05.25
Proposed Section AA and BB	LN-A-SK210	P02	20.05.25

1.3 Limitations of the Report

It is important to note that the fire strategy report does not represent a set design or specification; it is a series of principal recommendations that others may relate to the proposed design as appropriate. The information contained herein is strategic only and does not address detailed aspects of design or construction, such as construction details.

It is not always feasible to capture all diverse design and construction-related items within a single document. The aim of this report is to clearly establish the design principles of the project and demonstrate that the functional requirements of Part B of the Building Regulations 2010 (as amended) have been met. Subsequently, where an explicit design item is not outlined within the report, the fire engineering team should be consulted.

Any diagrams incorporated into this document are illustrative, intended to convey aspects of the Fire Safety Strategy and do not necessarily reflect the latest arrangement. The diagrams are not a substitute for the architectural general arrangement drawings or the detailed M&E drawings, or specifications, which should be referred to in conjunction with this report.

For clarity, whilst the below is not exhaustive, the information herein does not specifically address

- Insurance requirements.
- Property or business protection.
- Construction/fit-out fire safety.
- Detailed management procedures or duties under the Regulatory Reform (Fire Safety) order (RRO).

1.3.1 Information Provided by Others

The Fire Safety Strategy represents only the best judgment of the consultants involved in its preparation, and is based, in part, on information provided by others. Under no circumstances is liability accepted for the accuracy of such information provided by others.

1.3.2 Alternative Methods of Compliance

Where the Fire Safety Strategy proposes alternative methods of compliance, that have been based on accepted codes of practice, to satisfy the functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulations 2010 (as amended), they will be subject to the agreement of the approving authorities and local Fire and Rescue Service.

1.3.3 Minimum Requirements

This report outlines the minimum requirements to satisfy the functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulations 2010 (as amended). However, whilst these satisfy the statutory imperatives, Hydrock advise consideration of additional fire safety measures.



1.4 Buildings Overview

The development is comprised of two main high rise residential blocks annotated as the Southwest block and Northeast block within Figure 1. These two blocks contain private residential flats from the ground floor up to the sixth floor. The block of flats buildings are 7 storeys high each, (i.e., ground and six upper floors).

The building contains a lower ground floor that connects the two blocks that contains an underground car park and ancillary plant rooms. The site also contains six separate townhouses, with each considered a separate dwelling set out as two blocks of three at the Northwest and Southwest elevations sharing a common wall with the Northeast tower block as depicted in Figure 1. The roof levels of the two blocks are accessed for periodic maintenance for plant.

The Phase 5 of Royal Elm Park site is surrounded by a surface car parking, in addition to the subsurface lower ground floor car parking contained within the lower ground level, from three sides with a vehicle access routes all around the site. The southwest elevation is inaccessible to vehicles containing only footpaths and landscaping areas.

While the current proposal appears to be surrounded by surface-level car parking, this is within the scope of the approved Hybrid Planning Permission. In accordance with the planning permission, Phase 5 of the development cannot come forward ahead of the earlier phases. Therefore, although these earlier phases have not yet been delivered, it is assumed that they will be completed by the time Phase 5 is implemented. Similarly, while the later phases are not required to be delivered pre-phase 5, it is assumed that they will come forward in line with the planning permission.

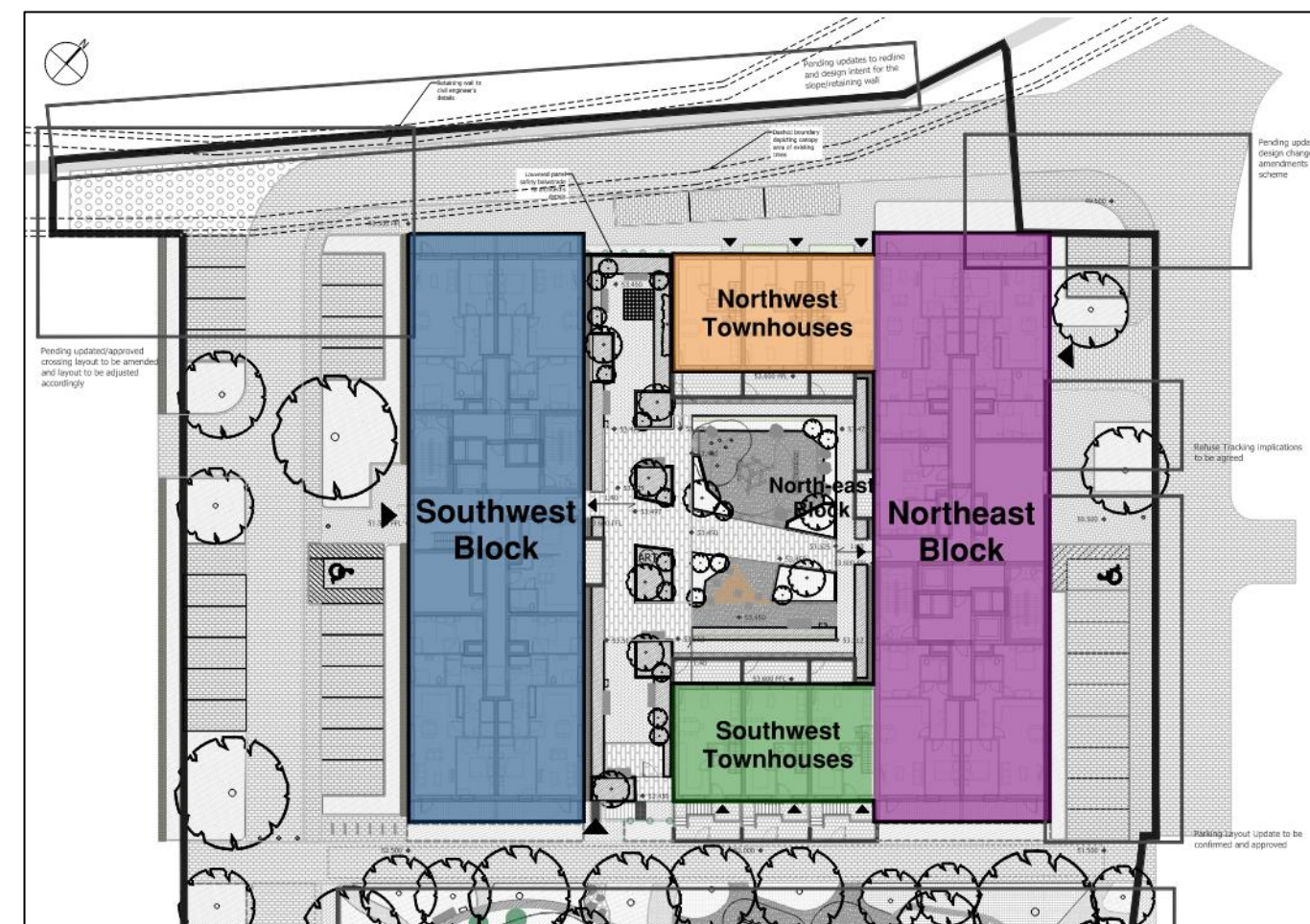


Figure 1 Site plan

1.4.1 General Arrangements

Lower Ground Level

The lower ground level connects both residential blocks. It should be noted that at the southwest elevation, the lower ground level is beneath ground level whereas at the northwest elevation due to the topography of the site is considered to be at ground level.

Further to the annotated fire safety provisions and arrangements shown in Figure 2; to the northeast side at this level of the lower ground level contains a bin store, cycle store and car park sprinkler tank room. Towards the southwestern side of the lower ground level, Royal Elm Park contains bin store, cycle store, substation, and LV switch room.

Refer to Figure 2 for indicative illustration for the lower ground level.



Figure 2: Lower Ground Floor General Arrangement

Ground Level:

The ground floor accommodates two tower buildings situated above a car park. An intermediate plaza area separates the buildings, providing direct access to each building through its respective ground floor entrance.

The Southwestern block, situated above the lower ground car park, contains five residential flat units and a communication room. A protected stair and an evacuation lift is situated at the side of the plaza area, both accessed via a protected lobby and discharging directly to the intermediate plaza and southwest elevation via the main entrance lobby. The southwestern block has a central core containing two lifts and two stairs connected each by a central communal corridor with primary access served by a split-level main entrance lobby containing an open stair. At size closest to the southwestern elevation, a firefighting shaft is provided, which consists of a firefighting stair, firefighting lobby, and dual use evacuation and evacuation lift accessed via a protected lobby and or the main entrance lobby, discharging to the western access route.

The ground floor of the Northeastern block comprises of five residential flat units, a protected stair, and an evacuation lift, both accessed via a protected lobby. In addition, this level contains a firefighting shaft, which includes a protected stair, a firefighting lift, and an associated lobby. The core arrangement is similar to the southwestern block's. Both stairs are positioned adjacent to each other but are physically separated by a fire-resistant wall and door.

The cores are ventilated using a combination of mechanical and natural smoke ventilation systems; with the former applied to the common corridors to flats and the latter to the lift lobbies. The ground floor serves as the discharge level for both the protected stair and the evacuation lift. In contrast, the firefighting shaft is accessed directly from the lower ground level, which aligns with the fire and rescue service access point.

Refer to Figure 3 for an indicative illustration of the ground floor level.



Figure 3: Ground Floor General Arrangement



Typical Upper Floor (First to Sixth Floor):

Floors one through six follow a comparable design arrangement with respect to layout and fire safety provisions. Each floor comprises residential flat units with open-plan kitchen layouts. Access to each floor is provided via two stair cores: the protected stair and the firefighting stair. Both elevators are available for use as evacuation lifts until the arrival of the fire and rescue service, at which point one firefighting lift is designated for their exclusive use within both blocks.

Refer to Figure 4 for an indicative illustration of the ground floor level.



Figure 4: Typical Upper Floor General Arrangement (Third Floor shown)

Roof Level

This roof level is dedicated to plant, services, and equipment overruns. Access is restricted to maintenance purposes only and is provided via an access hatch connected to both available stair cores. The plant located at the southwest block roof consists of a mechanical plant room, Air Source Heat Pump (ASHP) compound, and photovoltaic (PV) panels. The plant located at the northeast block roof consists of a standby generator, essential services switch room, and photovoltaic (PV) panels.

Refer to Figure 5 for an indicative illustration of the ground floor level.



Figure 5: Roof Level General Arrangement

The Roof Floor:

This floor is dedicated to plant rooms and lift headroom, with the entire roof area intended to accommodate photovoltaic (PV) panels. Access is restricted to maintenance purposes only and is provided via an access hatch connected to both available stair cores.

Town Houses:

The ground floor of each house serves as the main entrance level, accessed via stepped stairs leading directly to street level and providing access to kitchen and living room facilities. Each ground floor contains an open-plan layout and an internal protected stair. The upper floors, being floors one through to three of each townhouse, contain bedrooms and bathrooms. Each floor is accessed via the internal protected stair.

Refer to the fire safety markups provided in Appendix A for more detail on the townhouse arrangements.

1.4.2 Elevations & Building Height

For the purposes of this Fire Safety Strategy, the building height is considered to be 23.5m taken at the northwest elevation where the topography is most onerous as shown in Figure 6.



Figure 6: Northwest Elevation with Building height illustration



Figure 7: Southeast Elevation with Building height illustration



Figure 8: Southwest Elevation



Figure 9: Northeast Elevation

2 Legislation

The following sections provide an outline of the regulations and guidelines on which the Fire Safety Strategy is based.

2.1 The Building Regulations 2010

The building work will be subject to control under the restrictions of the Building Regulations 2010 (as amended). The Building Regulations are concerned with the life safety of persons in and around a building. The development will be designed and constructed to satisfy the functional requirements of Part B (Fire Safety) to Schedule 1 of the Building Regulations 2010 (as amended), which includes the following:

- 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

2.2 Other Applicable Legislation

2.2.1 The Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order (RRFSO) regulations shall apply to this development and are the landlord's responsibility. The RRFSO came into force in 2006 with the aim of resolving the overlap caused by a number of previous legislations. Therefore, a large number of legislations were rationalised and consolidated into the RRFSO, with the result that it also rationalised the number of enforcement authorities involved in fire safety matters.

The RRFSO applies to all workplaces and other non-domestic areas and premises, requiring the 'Responsible Person' to undertake an assessment of the fire risk in their premises and to keep this assessment under review. It requires that where the 'Responsible Person' does not have the relevant training and experience to undertake such an assessment, they must appoint a suitable 'Competent Person' to undertake the Risk Assessment.

The main focus of the Risk Assessment is to ensure that the premises are safe for the occupants to use and that all fire safety measures are adequate and appropriately maintained. In new buildings, the Fire Risk Assessment ensures that the fire safety provisions required under the Building Regulations 2010 are maintained, whereas in existing buildings, it ensures that, despite any modifications undertaken throughout the building's history, it is still safe for use. It is therefore important that the Fire Safety Strategy for more complex buildings (regardless of age) is clear and well-documented.

2.2.2 Fire Safety Act (2021)

The Fire Safety Act 2021 (enforced on 23.01.2023) has amended the applicability of the RRFSO to residential buildings as follows:

- 'Where a building contains two or more sets of domestic premises, the things to which this order applies include—

- (a) the building's structure and external walls, and any common parts;
 - (b) all doors between the domestic premises and common parts (so far as not falling within sub-paragraph (a)).
- The reference to external walls includes—
 - (a) doors or windows in those walls, and
 - (b) anything attached to the exterior of those walls (including balconies).'

This clarification empowers fire and rescue services to take enforcement action and hold building owners to account if they are not compliant.

2.2.3 Building Safety Act 2022

The Building Regulations (Amendment) (England) 2023 make a number of amendments to the Building Regulations 2010. This includes new responsibilities on those who commission building work (client) and who participate in the design and construction process (designers and contractors). These parties are defined as being the 'duty holders'.

It should be ensured that the all duty-holders understand their responsibilities under the Building Regulations (as amended).

Duty holder responsibilities, in general, during the design and construction phase include:

- To plan, manage and monitor the work to ensure compliance with the Building Regulations;
- To co-operate with other duty holders, sharing information, communicating effectively, supporting each other in compliance;
- Ensure that they and the people they appoint are competent, i.e. have the necessary skills, knowledge, experience and behaviours to carry out design work and building work and only do so within the limits of competence. Where organisations are involved, competence includes having appropriate organisational capability.

Refer to Part 2A of the Building Regulations 2023 for further information.

2.2.4 Fire Safety (England) Regulations 2022

These regulations came into force in January 2023, under Article 24 of the Regulatory Reform (Fire Safety) Order 2005.

The aim of these regulations is to make a requirement in law for responsible persons (building owners or managers) of new or existing multi-occupied residential buildings (two or more sets of domestic premises) to provide additional safety measures to the building. The additional safety measures required are based on the building height and are listed below.



All Residential Buildings

Provide fire safety instructions to residents - This shall include instructions on how to report a fire and any other instructions which set out what a resident must do once a fire has occurred, based on the evacuation strategy for the building.

Residential Buildings Over 11m

- Provide fire door information to residents - including information relating to the importance of fire doors in fire safety.
- Undertake check of fire doors - Flat entrance doors should be checked on an annual basis, and all fire doors in the common parts shall be checked quarterly.

Residential Buildings Over 18m

- Building Plans - provide their local Fire and Rescue Service with up-to-date electronic building floor plans and place a hard copy of these plans, alongside a single-page building plan which identifies key firefighting equipment, in a secure information box on site.
- External Wall Systems - provide their local Fire and Rescue Service information about the design and materials of a high-rise building's external wall system and inform the Fire and Rescue Service of any material changes to these walls. Also, they will be required to provide information in relation to the level of risk that the design and materials of the external wall structure give rise to and any mitigating steps taken.
- Lifts and other Key Fire-Fighting Equipment - undertake monthly checks on the operation of lifts intended for use by firefighters and evacuation lifts in their building, and check the functionality of other key pieces of firefighting equipment. They will also be required to report any defective lifts or equipment to their local Fire and Rescue Service as soon as possible after detection, if the fault cannot be fixed within 24 hours, and to record the outcome of checks and make them available to residents.
- Information Boxes - install and maintain a secure information box in their building. This box must contain the name and contact details of the Responsible Person and hard copies of the building floor plans.
- Wayfinding Signage - to install signage visible in low light or smoky conditions that identifies flat and floor numbers in the stairwells of relevant buildings.

The two blocks of flats are subject to the obligations under the Fire Safety (England) Regulations 2022.

2.2.5 Regulation 38

In conjunction with the RRFSO, Regulation 38 requires that information relating to the fire safety provisions within a building is provided to the 'Responsible Person' so that they (or an appointed 'Competent Person') can undertake the Fire Risk Assessment required under the RRFSO. It is therefore of paramount importance that the fire safety information for a building that falls under the requirements of the Building Regulations 2010 is kept up to date and a true reflection of the completed building.

This report does not form the Risk Assessment required under the RRFSO, nor does it absolve the client from exercising their duties under Regulation 38. However, the aim of this Fire Safety Strategy is to demonstrate how the project complies with the requirements of the Building Regulations 2010 (as amended) and therefore should form

part of the information provided to the 'Responsible Person' in order for them to undertake and maintain the Fire Risk Assessment for the project.

2.2.6 Regulation 7(1)

Regulation 7 and specifically Regulation 7(1) of the Building Regulations requires building work to be carried out in a workmanlike manner, with adequate and proper materials that are appropriate for the circumstances in which they are used. Such materials should be adequately mixed, prepared, applied, used and fixed to enable them to perform as designed.

To ensure the Material and Workmanship requirements of Regulation 7(1) are satisfied, it is recommended that suppliers and installers of independent certification schemes (i.e. third-party accreditation) are used for this development.

2.2.7 Construction, Design and Management Regulations

The Construction (Design and Management) Regulations 2015 (CDM:2015) were introduced to minimise the risk to persons constructing, using and maintaining buildings. This is done by ensuring that, during design and development, health and safety is sufficiently considered.

Where reasonably practicable, foreseeable hazards should be eliminated, minimised and/or controlled within the design. There are no significant and/or unusual residual hazards associated with this development resulting from the fire strategy recommendations of this report.

2.3 Guidance Documents

Guidance referred to in this report includes, but is not limited to the following:

- BS 9991:2024 (including June 2025 Corrigendum C1) 'Fire Safety in the design, management and use of residential buildings – Code of practice';
- BS 9999:2017 'Fire Safety in the design, management and use of buildings – Code of practice';
- BS 5839-1:2025 'Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in non-domestic premises';
- BS 5839-6:2019+A1:2020 'Fire detection and fire alarm systems for buildings - Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises';
- BS 5499-4:2013 'Code of practice for escape route signing';
- BR 187:2014 'External Fire Spread – Building separation and boundary distances';
- BS 5266-1:2016 'Emergency lighting. Code of practice for the emergency lighting of premises';
- BS EN 13501-1:2018 'Fire classification of construction products and building elements. Classification using data from reaction to fire tests';
- BS 4422:2024 'Fire – Vocabulary'



Guidance for the fire precautions will generally follow the recommendations contained within BS 9991:2024 and where applicable BS9999:2017.

Any deviations from these standards are to be provided with justification demonstrating that the functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulations 2010 (as amended) are met; however, these will be subject to approval from the approving authority and local Fire Service.

Where no specific provision is mentioned in this document regarding any particular aspect, reference should be made to BS 9991:2024 (including June 2025 corrigendum).

At this point, Stantec (Fire) have not been provided by any client requirements pertaining to fire safety, which may have greater or more onerous requirements than those requirement for compliance with fire safety guidance, in order to satisfy the functional requirements of Part B (Fire Safety) of the Building Regulations 2010.

Should this be the case, some elements of this fire strategy report and design proposals may be subject to change in future, upon review, in order to satisfy any client requirements that are more onerous than those outlined within this report.

The Fire Safety Strategy is to be read in conjunction with the Fire Strategy Drawings in Appendix A.

2.4 Additional Information on Guidance

2.4.1 EWS1 Certificate

The Royal Institution of Chartered Surveyors (RICS), The Building Societies Association (BSA), and UK Finance have introduced an industry-wide valuation designed to help building owners to confirm to valuers and lenders that an external wall system or attachments, such as a balcony, on buildings containing flats have been assessed by a suitable expert.

The standardised External Wall Fire Review process requires a fire safety assessment to be conducted by a suitably qualified and competent professional. This is aimed at delivering assurance for lenders, valuers, residents, buyers and sellers and assisting in the valuation of high-rise properties, with actual or potential combustible materials in external wall systems and balconies.

2.4.2 PAS 9980:2022

In the wake of the Grenfell Tower fire, The Ministry of Housing, Communities and Local Government (MHCLG) published a series of Advice Notes intended to manage the ongoing concern of fire safety with regard to external walls. In January 2020, the Consolidated Advice Note was published, which brought together the guidance contained within all of the published Advice Notes. This Consolidated Advice Note outlined the MHCLG's (now the Department for Levelling Up, Housing and Communities [DLUHC]) position on the actions that building owners should take to reduce the risk of fire spread from unsafe external wall systems.

On 10th of January 2022, the DLUHC withdrew the Consolidated Advice Note and replaced it with the Publicly Available Specification (PAS) 9980 with the intent of addressing inconsistencies in the appraisal of risks associated with external wall systems.

The Fire Safety Act 2021 amends the applicability of the Regulatory Reform (Fire Safety) Order (RRO) to include external wall construction as part of the periodic Fire Risk Assessment (FRA). Qualified assessors are required to give consideration to the potential spread of fire via the external walls of the building. Where a risk to life safety is

identified, or where the risk to life safety is unclear, a Fire Risk Appraisal of External Walls (FRAEW) should be recommended as part of the FRA action plan. The FRAEW is intended specifically to inform the FRA of the risks associated with the external wall construction and to present, if any, the remedial action that is required.

The FRAEW is not solely influenced by the benchmarks given in the regulations and guidance, both current and those that were applicable at the time of construction. Instead, the FRAEW considers the external wall construction in relation to Building Regulation Functional Requirement B4. Hence, the PAS 9980:2022 presents a risk-based methodology which is intended to provide consistency to the appraisal of risks associated with fire spread over the external walls in the FRAEW process. The tool considers three factors:

1. Fire performance: The likely speed and extent of fire spread as a result of fundamental material properties and their installation.
2. Façade configuration: The likely speed and extent of fire spread as a result of the quantity, location and arrangement of combustible material; the presence of extensive cavities, and the potential routes for fire re-entry to the inside of the building.
3. Fire strategy: All factors influencing the means of escape for occupants and the accessibility of the site and external walls for the fire and rescue service.

The outcome of the FRAEW is presented as part of the FRA (required under the RRO) to routinely consider the matters relating to fire safety.

The Royal Institute for Chartered Surveyors (RICS) published the EWS1 form as a standardised means of informing lenders and valuers that the external wall systems (and any attachments) have been reviewed and assessed by a qualified expert. The form itself is not an assessment methodology. Therefore, the means for assessing the external wall systems in any building is left open to the assessor and their best judgment. However, with limited guidance on external wall fire risk assessments, the ongoing concern regarding fire spread via external walls has been met with inconsistencies in the appraisal of risk. The PAS 9980:2022 has been published with the intent of addressing this inconsistency and restoring a standardised methodology for risk appraisal. RICS, as the author of the EWS1 form, has publicly recommended the use of the PAS 9980:2022 when preparing the EWS1 form. Therefore, the assessment methodology presented in the PAS 9980:2022 is considered to be an industry recognised standard for the purposes of the EWS1 form.



3 Fire Protection Systems

This section describes the fire protection systems to be provided with the development in order to ensure the safety of occupants and Fire Service personnel in the event of a fire.

3.1 Emergency Lighting

In the event of a failure of the normal lighting supply, emergency escape lighting should be provided to ensure safe evacuation. It should illuminate exit doors, escape route direction signs, and other safety signage to aid navigation. Emergency lighting must also provide clear visibility along escape routes, including those outside the building. Additionally, it should facilitate essential safety measures before evacuation, such as safely shutting down equipment (in case of non-residential areas) and ensuring all occupants have vacated the premises.

Suitable lighting should be provided to all premises to enable the safe movement of persons along escape routes to a pace of relative or ultimate safety. The means of escape routes requiring the provision of adequate escape lighting are the following:

- Underground or windowless accommodation;
- Stairways in a central core or serving storey(s) more than 18m above ground level;
- Internal corridors more than 30 m long;
- Open-plan areas of more than 60 m²;
- All sanitary accommodation with a floor area over 8m²;
- Facilities for use by disabled people, and/or any multiple closet facilities without borrowed light, should have emergency illumination from at least one luminaire;
- Electricity and generator rooms;
- Switch room/battery room for emergency lighting system; and
- Emergency control room.

Emergency lighting will be provided throughout the development designed, installed and commissioned in accordance with BS 5266-1:2016 and BS EN 1838:2013. Emergency lighting should be provided with 3-hour integral batteries.

Defined escape routes should be illuminated to a level of not less than 1 lux at the floor level along the centre line of an escape route up to 2m in width in accordance with BS 5266-1:2016, Cause 5.2.5. Open plan areas greater than 60m², or those having been risk assessed as needing emergency lighting, should be illuminated to a level of not less than 0.5 lux at floor level of the area in accordance with BS 5266-1:2016, Cause 5.2.6.

Therefore, emergency lighting is to be provided throughout the development (including the adjacent external escape route), designed, installed and commissioned in accordance with BS 5266-1:2016.

3.2 Smoke Control & Ventilation

The build-up of hot smoke and gases within a building produced by fire can both impede occupants' ability to escape and also the local Fire and Rescue Services' ability to access the area of the building to undertake firefighting, as well as search and rescue operations.

3.2.1 Protected Stairs

All protected stairs serving upper floors of the block of flats are to be equipped with an Automatic Opening Vent (AOV) at the head of the stair, operated on smoke detection within the stair enclosure and a manual call point at the final exit from the stair. The AOV must have a minimum aerodynamic free area of not less than 0.7m² in line with Section 7.2.2 and Table 3 of BS 9991:2024.

3.2.2 Common Corridors and Lobbies

According with Section 20.2.2.3 and Table 3 of BS9991:2024, a building less than 30m but greater than 18m in height may make use of a natural smoke shaft to ventilate residential common corridors and or protected lobbies that connects to an escape or firefighting. The mechanical smoke ventilation system (MSVS) is provided at each level, with a mechanical supply located within/near the evacuation lift lobbies and a mechanical extract at the southern end of both common corridors.

For mechanical smoke ventilation systems (MSVS), a computational fluid dynamics (CFD) analysis should be undertaken to demonstrate that the system achieves the desired performance. For example, it should be verified that the proposed smoke ventilation system protects the stair enclosure from smoke ingress, both during the means of escape phase and when the stair door is held open during firefighting operations. When undertaking CFD analysis, and whilst the principal objective is to protect the stair from the ingress of smoke and maintain it smoke-free, it might be considered acceptable by the designer for a very small amount of smoke to be shown to enter the stair enclosure. The MSVS will operate upon activation (detection of fire or smoke) of the Category L5 fire detection and alarm system. The system will be designed by a specialist smoke control designer and Computational Fluid Dynamics (CFD) will be used to demonstrate system performance to the approving authorities. The system will ensure that smoke is prevented from entering the firefighting stair and associated lobby. Stantec Fire are required to conduct a high-level review of the MSVS design to ensure it meets the principles of the fire safety strategy prior to issue of the Gateway 2 fire safety strategy.

3.2.3 Ancillary Areas

In accordance with clause 10 of BS 9991:2024, in buildings with a storey 18m or more above ground level, one or more common stairs should be designed as firefighting stairways. As phase 5 of Royal Elm Park is divided into two separate residential blocks both ascending greater than 18m high, a firefighting core has been provided to both.

The building should meet the following recommendations:

- a) No storeroom should open directly into a common stair;
- b) If any storey or part of a storey is required to have more than one escape route, common stairs should be sited such that access to alternative common stairs is possible from any point on that storey without passing through any other such stairway;



- c) If a common stair forms part of the only escape route from a dwelling, it should not be connected to any ancillary area on the same storey as that dwelling.

In line with Section 13.2 and Table 1 of BS 9991:2024, where protected lobbies or protected corridors give access to ancillary accommodation, these spaces should be ventilated through 1m² ventilation or, where the building is provided with an automatic sprinkler protection in accordance with BS 9251:2021 or BS EN 12845:2015+A1, it is possible to reduce this to 0.4m² ventilation. Ventilation can be provided either as a permanent ventilation or as an AOV with an aerodynamic free area of not less than 0.7m². Where a stair provides access to an ancillary area, a ventilated protected lobby/corridor should be provided at that level, as specified in Table 1 of BS9991:2024 and summarised in Table 2.

Table 2 Protected lobby/corridor ventilation

Accommodation Area	Free Area of Vent	
	Minimum Free Area	Aerodynamic Free Area
Communal lounges and common amenity areas	1m ² [1]	0.7m ²
Transformer, switchgear and battery rooms for low voltage or extra low voltage equipment	1m ² [1]	0.7m ²
Engineering service installation rooms	1m ² [1]	0.7m ²
Refuse chutes and refuse storage areas	1m ² [1]	0.7m ²
Other storage areas, including electric wheelchair/mobility scooter charging areas and bicycle stores (with and without charging points)	1m ² [1]	0.7m ²
Installation rooms for engineering services housing internal combustion engines	1m ²	0.7m ²
Boiler rooms and fuel storage spaces	1m ²	0.7m ²
Transformer and switchgear for equipment above low voltage	1m ²	0.7m ²
Car park areas	1m ²	0.7m ²

- Notes:
1. This can be reduced to 0.4m² where sprinklers are provided in accordance with BS 9251:2021 or BS EN 12845:2015+A1 throughout the building.

Refer to the relevant comments on ventilation required to ancillary accommodation opening onto escape routes specified within the attached fire safety markups within Appendix A.

Furthermore, in accordance with subclause 27.2.1 of BS9991:2024, access hatches for service shafts should not be situated within an escape stairway, unless the service shaft provides smoke control or pressurisation for that stair.

CFD will be required to verify that the conditions within the corridor are equivalent or better to solutions presented within Figure 27 & Table 1 of BS9991:2024.

Covered Car Park

The natural venting openings of the car park to the open air should provide at least 54 m² venting area (i.e., 2.5% of the car park area), distributed around the perimeter of the car park and sited as high as practicable (e.g., at wall or ceiling) in line with BS 9991:2025, Clause 20.3.2.2.

If natural ventilation target areas are not achievable, a mechanical smoke control system should be proposed designed in accordance with BS7346-7:2013, to facilitate the clearance of smoke during a fire or after it has been suppressed. As per BS9991:2024, enclosed car parks should have 10 air changes per hour (ach-1) for smoke clearance purposes, the system is to be design and installed in accordance with BS7346-7.

3.2.4 Common Corridor and Lobby Ventilation

The protected corridors serving the flats will be equipped with a mechanical smoke ventilation system (MSVS), consisting of two smoke control shafts located at opposite ends of the corridor. Upon detection of smoke in the corridor, the shaft at the end where smoke is present will extract smoke, while the opposite shaft will supply fresh air. This system ensures that smoke is not pushed further into the corridor and past other flat doors and is instead extracted as close as possible to the source.

It should be noted that the mechanical smoke ventilation systems must be designed so that, upon detection of smoke in a common corridor, only the relevant mechanical shafts and associated smoke control dampers on the floor of fire origin are activated, along with the automatic opening vent (AOV) at the head of the stair. The smoke control dampers on all other floors should remain closed.

In accordance with subclause Annex F, F.5.1.4 of BS9991:2024, the mechanical smoke shafts should meet the following requirements:

- The smoke shaft must be fully open to the external air at the top and closed at the base;
- The cross-sectional area (free area) of the smoke shaft should be sized according to the MSVS requirements but must not be less than 0.6m², with a minimum dimension of 0.6m in any direction;
- The top of the lobby or corridor vent should be located as close to the ceiling of the lobby or corridor as practicable and must be at least as high as the top of the door connecting the lobby or corridor to the stairway;
- Vents or AOVs opening to the outside should be natural smoke ventilators;
- AOVs opening into shafts or ducts should be fitted with smoke control dampers;
- No services, including control devices for the smoke shaft, should be contained within the smoke shaft.

All stair/lift lobbies are considered evacuation lift lobbies. Where evacuation lifts lobbies are provided, a smoke control system should be afforded to offer equivalent level of protection to the evacuation lift lobby as to the stair and should not extract from the lift lobby itself. As the evacuation lift lobby provides refuge for escaping occupants waiting to use the lift, some means of ventilating the evacuation lift lobby should be provided to minimize the exposure of occupants to smoke and heat, whilst preventing further smoke ingress to the lobby, in line with Section 7.4.4 and Table 3 of BS9991:2024. The evacuation lift lobby may be an extension of the ventilation provision in the corridor protecting the stair, or as a separate additional ventilation provision that is compatible with those provided in the corridor.

All evacuation lift lobbies within the development will be provided with a natural smoke shaft that acts as an extension of the adjacent lobby/corridors. The four natural smoke shafts specified per evacuation lift lobby are each to achieve a minimum cross-sectional free area of 1.5m² with a minimum dimension of 0.85m in any direction and meet the specifications detailed within BS 9991:2024, Annex F, Clause F.5.1.3.

Evacuation lift lobbies are provided in both cores from lower ground floor to the sixth floor. In accordance with Figure 31 of BS 9991:2024, it is not considered necessary to provide ventilation at the ground floor/terminating point of the



Evacuation lift lobby. Despite this, the natural smoke shaft to the evacuation lift lobbies will extend and serve the ground floor.

The smoke control strategy for the residential protected lobbies and corridors serving flats is depicted in Figure 10.

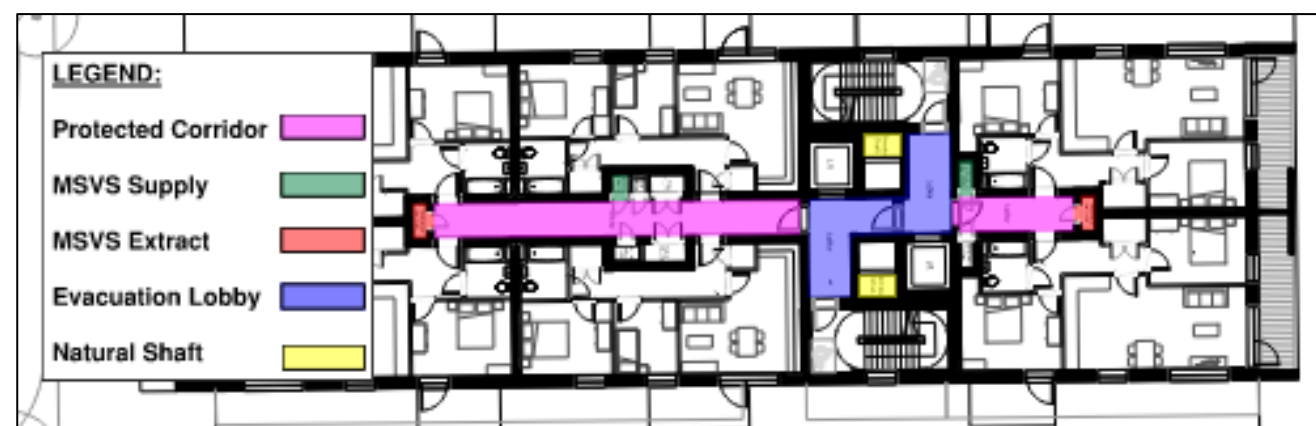


Figure 10 Smoke Control Strategy Arrangement

3.3 Fire Suppression Systems

Residential Units & Communal Areas

As the building is greater than 11m in height, it should be provided with an automatic sprinkler system, in accordance with BS 9251:2021, as outlined within Clause 17 of BS9991:2024.

As per Table 2 of BS 9991:2024, as the building is greater than 18m in height, a Category 4 sprinkler system is to be provided.

The townhouses are not required to be protected with a sprinkler system. However, it is advised that the system is continued to serve these areas as an additional measure.

Ancillary Accommodation

If the compartment area of any non-residential occupancy listed in Table 4 of BS9251:2021 exceeds 100 m², the sprinkler system within that area should be designed, installed, and commissioned in accordance with BS EN 12845:2015, following commercial sprinkler design standards.

The following compartments exceed 100m² in area and will, therefore, be provided with a sprinkler system designed, installed, and commissioned in accordance with BS EN 12845:2015+A1, following commercial sprinkler design standards:

- Car Park (1,334 m²);
- Cycle Store (122.9 m²)

3.4 Electrical Installations

The electrical supply arrangements should comply with BS 7671:2018, with particular attention given to ensuring suitable support for cabling to prevent obstruction of escape routes and firefighting access in the event of fixing

failures. In accordance with wiring regulation 521.10.202, wiring systems shall be supported such that they will not be liable to premature collapse in the event of a fire. Suitably spaced steel or copper clips, saddles, or ties are examples that meet this regulation.

Cables or other electrical equipment shall not be installed in a firefighting lobby, shaft or staircase of a protected escape route unless part of:

1. An essential fire safety or related safety item (e.g., life safety cabling, fire detectors, etc);
2. General needs lighting; and
3. Socket-outlets providing for cleaning or maintenance.

Only cables that meet the following requirements shall be installed in protected escape routes:

- cables meeting the requirements of 560.8.1 or cables with resistance to flame propagation according to the recommended requirements of the relevant part of BS EN 60332-3 series or, where cable management systems according to (iii) or (iv) below are used, to the recommended requirements of BS EN 60332-1-2 and
- a minimum of 60 % light transmittance when tested in accordance with BS EN 61034-2

Cables in protected escape routes shall be as short as practicable. Cables encroaching on escape routes shall not be installed within arm's reach unless they are provided with protection against mechanical damage likely to occur during an evacuation.

Where used in protected escape routes, cable management systems shall be one or more of the following types and shall be of limited smoke production so as not to inhibit escape:

- conduit systems classified as non-flame propagating according to BS EN 61386
- cable trunking systems and cable ducting systems classified as non-flame propagating according to BS EN 50085
- cable tray and cable ladder systems classified as non-flame propagating according to BS EN 61537
- powertrack systems meeting the requirements of BS EN 61534.

Automatic Transfer Switches (ATS) shall be provided in accordance with BS EN 60947-6-1:2021 and be secured against tampering, not subject to water ingress and enclosed in fire resisting construction.

All life safety plant should be provided with a primary external source of power. The secondary power supply should be capable of providing the power supply for items within 15 seconds of the failure of the primary electrical supply. Cables and wiring supplying power to life safety installations should be provided in accordance with BS 8519:2020 and BS 7671:2018, respectively.

3.5 Emergency Power Supplies

A secondary power supply shall be provided to reduce the risk of the loss of electrical supply to life safety and firefighting systems that are required to operate continuously during a fire, including:

- Emergency lighting and illuminated escape signage;
- Emergency voice communication (EVC) systems;



- Automatic fire and smoke dampers (that are not equipped with a fail-safe switch);
- Fire detection and alarm systems (primary from a public supply or equivalent system, and a standby rechargeable battery supply with charging capabilities in accordance with BS EN 54-4:1998);
- Firefighters/evacuation lifts;
- Smoke control systems i.e. automatic openable vents and mechanical smoke control.
- Category 4 BS 9251:2021 sprinkler system.

The primary power source should be taken from the public electricity supply, while the secondary source should be one of the following:

- A life safety generator; or
- An independent high voltage supply fed from an independent utility primary network substation to that feeding the primary supply; or
- An uninterruptible power supply (UPS) in accordance with the electrical load requirements.

In the case of sprinkler systems, a diesel-driven fire pump set for fire protection service is also an acceptable form of secondary power source.

The electrical supply arrangements should comply with BS 7671:2018, with particular attention given to ensuring suitable support for cabling to prevent obstruction of escape routes and firefighting access in the event of fixing failures.

If the primary power source fails, the supply should automatically switch to the secondary source. It is essential that the failure of one source does not compromise the alternative source or result in the loss of power to life safety and firefighting equipment.

A standby generator is currently proposed on the roof level of the southwest block. The design team are to confirm if this standby generator is provide means of secondary power for life safety systems. Should this be the case, the roof slab supporting this standby generator is considered to be supporting life safety plant and will be required to achieve 120 minutes REI fire resistance with exposure from the underside in accordance with BS 8519:2020, Section 6.3.

3.6 PV Panels

Where PV panels are provided, it is recommended that an isolation switch be provided for Fire and Rescue Service use, located at the access point to the roof or the associated PV plant room.

For more information, see Section 7.4.1



4 Means of Warning and Escape

Functional Requirement B1:

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

4.1 General

Means of escape from the building is generally to be in accordance with BS9991:2024. Where the proposed means of escape strategy deviates from this guidance document it will require agreement with the Approving Authority and local Fire and Rescue Service.

4.2 Evacuation Strategy

Residential Units:

The recommended evacuation strategy for the residential studio units is based on a 'stay-put' strategy whereby only the occupants of the dwelling of fire origin are alerted and evacuate, and all other occupants remain in their dwellings unless they are directly affected by fire or smoke or instructed to do so by the fire and rescue service. This does not preclude the event that occupants may wish to self-evacuate at any time.

The recommended evacuation strategy for the ancillary areas is based on a simultaneous evacuation strategy whereby all occupants within these areas are alerted and evacuate immediately upon fire detection. Where a fire is detected in the common/ancillary areas of the basement or ground, both floors should be alerted to evacuate.

Non-Residential Areas:

The evacuation strategy for the non-residential areas is based on a single-stage simultaneous evacuation approach, where the activation of a manual call point or detector triggers an instantaneous warning from all fire alarm sounders within non-residential areas alone for immediate evacuation.

4.3 Fire Detection and Alarm System

Fire detection and alarm systems are designed to give warning of fire at an early stage to enable all occupants to evacuate the building safely, before the escape routes are impassable owing to the presence of fire, smoke or toxic gases.

4.3.1 Lower Ground Car Park

Car Park Area

The Car Park on the lower ground level should be provided with a Category L3 fire alarm and detection system in accordance with BS 5839-1:2025.

Common Areas

The common areas in the lower ground level should be provided with a Category L5 fire alarm and detection system in accordance with BS 5839-1:2025, to activate the relevant smoke ventilation system. within the associated stair and lobby and open the pressure relief vent on the floor of origin only.

Ancillary Areas:

The ancillary areas in the lower ground level, including the bin stores, cycle stores, substation, and LV switchgear room, should be provided with a Category L3 fire alarm and detection system in accordance with BS 5839-1:2025.

There will be no sounders in the common residential corridors, owing to the 'defend in place' strategy. There will however be detection that will initiate the smoke control systems and alert the building management team.

4.3.2 Residential Blocks

Flats:

All dwelling flats should be provided with a grade D, Category LD1 fire alarm and detection system throughout, in accordance with BS5839-6:2019+A1:2020.

A Category LD1 system is defined as a system installed throughout the premises, incorporating detectors in all circulation areas that form part of the escape routes from the premises, and in all rooms and areas, other than those with negligible sources of ignition, such as toilets, bathrooms and shower rooms.

Common Areas:

The common areas in the lower ground level should be provided with an L5-type fire alarm and detection system in accordance with BS 5839-1:2025, to activate the relevant smoke ventilation system. within the associated stair and lobby and open the pressure relief vent on the floor of origin only.

Ancillary Areas:

The ancillary areas in the lower ground level, including the bin stores, cycle stores, substation, and LV switchgear room, should be provided with an L3-type fire alarm and detection system in accordance with BS 5839-1:2025.

There will be no sounders in the common residential corridors, owing to the 'defend in place' strategy. There will however be detection that will initiate the smoke control systems and alert the building management team.

4.3.3 Town Houses

All townhouses should be provided with a grade D, Category LD1 fire alarm and detection system throughout, in accordance with BS 5839-6:2019+A1:2020.

4.3.4 Indicating Equipment and Controls

The fire alarm panel should be located at an appropriate location for both staff and firefighters. They should normally be in an area with the fire and rescue services' access level close to the entrance of firefighting stairs on each block of flats.



Repeater panels will also be provided at the entrance to each stair core at ground floor within an appropriate location for both staff and firefighters responding to a fire signal, such that the controls can be readily operated, and indications are readily visible.

4.3.5 Evacuation Alert System

In line with BS 9991:2024, in residential buildings with a storey more than 18m above ground level, an evacuation alert system (EAS) should be provided to enable the fire and rescue service to initiate operation of evacuation alert sounders within each dwelling of a single floor, multiple floors or across the entire building, according to the circumstances.

Within each dwelling, at least one evacuation alert sounder should be provided, conforming to BS EN 54-3. Evacuation alert and control indicating equipment (EACIE) for the EAS should be sited in accordance with BS 8629:2019. The EACIE should be located such as not to impinge on the effective width of escape routes.

The Evacuation Alert System (EAS) must not be integrated with the fire detection and fire alarm system, or with any other system. No devices, other than evacuation alert devices, are to be connected to the EAS (i.e. fire detectors or similar devices must not be connected).

Evacuation alert zones should be provided in accordance with the recommendations of clause 9.2 of BS 8629:2019:

- The boundaries of every evacuation alert zone should, so far as practicable, be selected such as to minimize the overlap of the evacuation alert signal in any evacuation alert zone into another.
- The extent of overlap of evacuation alert zone should not result in confusion of occupants of any flat
- No evacuation zone should extend beyond a single storey of the building
- A common evacuation alert signal should be used throughout all evacuation alert zones to convey the need for evacuation
- In evacuation alert zones other than that which an evacuation alert signal is given, no other form of signal should be given by the evacuation alert system (e.g. an 'Alert' signal, of the type given by two-stage fire detection and fire alarm systems in non-domestic premises).
- The premises management or purchaser should ensure that the configuration of the evacuation alert zone is agreed by the fire and rescue service, and where relevant, the appropriate building control body.

4.3.6 Fire Alarm Interfaces

An automatic fire alarm system will have interfaces and links as necessary to operate equipment/devices, and a number of examples are indicated below; for more information, see BS 5839-1:2025:

- Electromagnetic hold-open devices on fire doors – released to closed position;
- Security systems on exit doors – released as required;
- Gas supply valves (plant areas) – isolate;
- Heating, ventilation and air conditioning systems – shut down to restrict the spread of smoke and hot gases.
- Smoke ventilation systems – relevant system activates depending on location of detection;

4.4 Horizontal Means of Escape

The following sections present the initial planning conditions which are deemed to satisfy the horizontal means of escape for the development.

4.4.1 Internal Flat Layouts

The internal layouts for flats within phase 5 of Royal Elm Park should be designed in accordance with the classifications and requirements set out in BS9991:2024, Section 8, as outlined in the following sections. Phase 5 of Royal Elm Park is a general needs scheme. Therefore, occupants are considered to be able to evacuate their own unit without relying on further assistance.

Open plan flats are deemed acceptable to be provided throughout the entire scheme. For clarity, while all flats have internal corridors, a Category LD1 fire detection and alarm system is to be provided in accordance with BS 5839-6:2019+A1:2020, with all flats being provided with a sprinkler system conforming to BS 9251:2021, and are designed to have travel distances from any point within to the flat entrance door of less than 20m as per Subsection 8.4.2a) of BS9991:2024. Therefore, flats are to be designed as 'open plan flats' in accordance with BS 9991:2024, Subsection 8.5 as detailed in the below section.

4.4.2 Open Plan Flats

In accordance with subclause 8.5 of BS 9991:2024, open-plan flats with bedrooms that are inner rooms, should be fitted with a Grade D, Category LD1 fire detection and alarm system in accordance with BS 5839-6:2019+A1, and a sprinkler system. The total travel distance from any point of such a flat to the entrance door of the flat should be limited to 20m as per subclause 8.4.2a) of BS 9991:2024.

Additionally, open-plan flats should meet the following specific recommendations, as outlined in subclause 8.5 of BS9991:2024.

- The size of the open-plan flat should not exceed 16m × 12m.
- Open-plan flats should be situated on a single level only.
- The ceilings within the open-plan flat should have a minimum height of 2.25m.

All flats within phase 5 of Royal Elm Park are understood to align with the above specifications.

Where the escape route from a habitable room is through a living area containing an unenclosed kitchen, the following recommendations should be met, as illustrated in Figure 11.

- The edge of the cooking apparatus should be at least 1.8 meters away from an escape door, a door to an adjoining habitable room, or a means of escape route to an escape door.
- All egress routes from habitable rooms to the escape door should be at least 0.9m in width. No fixed obstructions (such as radiators or cupboards) should be within the 0.9m escape route.
- A gap of 0.3m should be provided between the leading edge of the exit door from the space containing the cooking facility and the 1.8m zone from the cooking apparatus, allowing people with mobility impairments to access the door hardware.



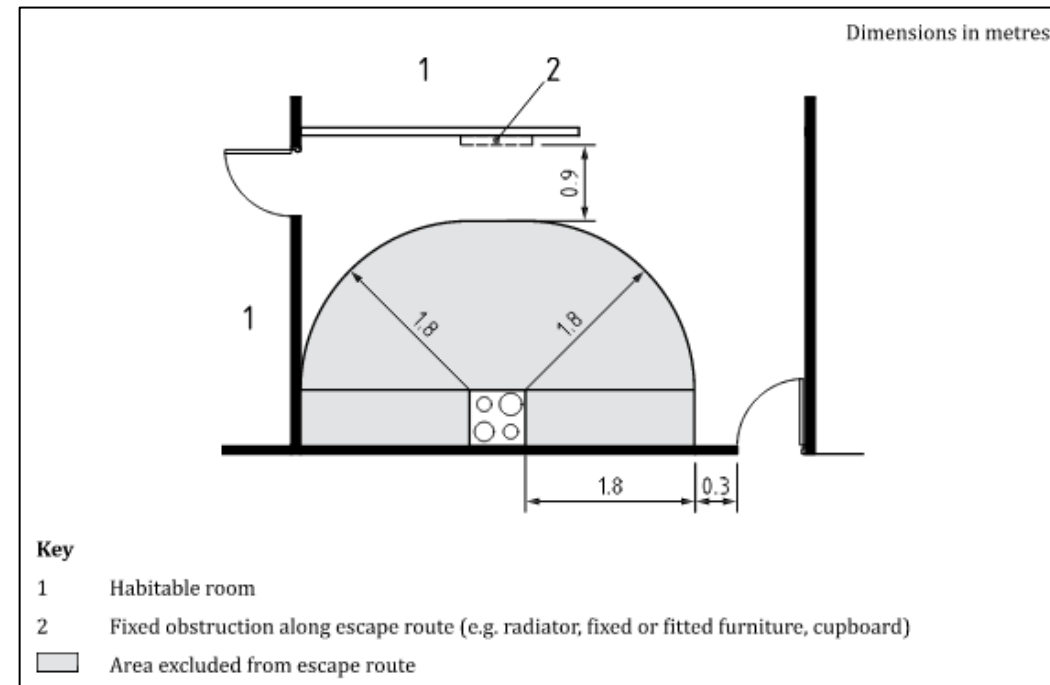


Figure 11: Minimum separation distances of cooking facilities from escape routes in an open-plan kitchen (Figure 2 of BS9991:2024).

Based on the latest general arrangement plans provided, the final hob location has not been specified. The hob location should be clearly defined and positioned in accordance with the minimum separation distances from the escape route and kitchen exit as per Figure 11.

4.4.3 Townhouses

Townhouses are located between the two high rise blocks accessed from the lower ground level and spanning up to the second-floor level giving a height of 9.7m. However, the townhouses at the lower ground floor level are provided with only access at this level and in the form of a protected stairway. Therefore, their height is taken from the ground floor level and not lower ground floor giving a height of 6.4m. As such, they should be treated as houses for internal planning purposes and designed in accordance with subclause 6.2 of BS 9991:2024.

Therefore, each townhouse should have a protected stairway provided from the habitable rooms direct to the entrance at ground level, with all accommodations, with the exception of bathrooms, separated from this route by 30-minute fire-resisting construction and accessed via E30 or FD30 fire doors.

Alternatively, maisonettes can be designed in accordance with subclause 8.8.2 of BS 9991:2024 (maisonettes having a floor level more than 4.5m above ground level).

4.4.4 Common Corridor

The proposed communal means of escape within the high-rise residential blocks consist of common corridors connecting two protected escape stairways. One stairway is designed as a firefighters' stair and is paired with a corresponding firefighters' lift (also used as an evacuation lift until fire service override), while the other is an escape stair, paired with an evacuation lift. The two stairways/lifts are located in close proximity to each other. Therefore, the common corridors are to be designed in accordance with subclause 7.2.1 of BS 9991:2024 as illustrated in Figure 12.

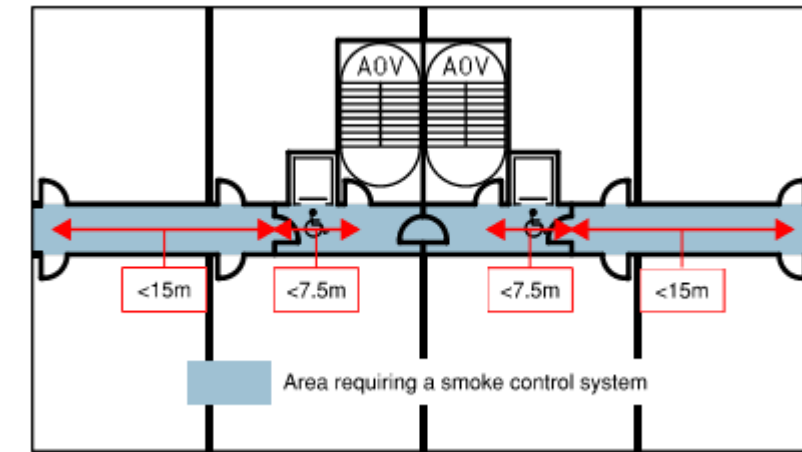


Figure 12: Figure 15c) of BS9991:2024

The common corridor should be separated from the protected lobby by a cross-corridor door and provided with smoke ventilation (see Section 3.2.4). As the building is protected throughout by a sprinkler system, the following travel distance limitations apply:

- From a dwelling entrance to the lobby door within any single direction part of a corridor should not exceed 15m.
- From the lobby door to the stair entrance should not exceed 7.5m.

4.4.5 Private Balconies

Private balconies located above the first floor (more than 4.5m above the ground level) should meet the following recommendations, in accordance with Annex E.3 of BS 9991:2024:

- The escape route from the balcony should not pass through more than one access room.
- Either the interior of the access room should be clearly visible from all parts of the balcony, or a fire detection and alarm system in accordance with BS5839-6:2019 should be provided, with detection in the access room and an audible warning on the balcony when the external doors are closed.
- Any cooking risk in the access room should be enclosed with fire-resisting construction or meet the recommendations for an open-plan kitchen given in subclause 5.6 of BS 9991:2024, as outlined in Section 4.4.2.
- Where the travel distance from the balcony access door to the furthest point on the balcony exceeds 7.5m, it should be provided with an alternative escape route without going via the same access room, or a fire detection and alarm system in accordance with BS 5839-6:2019:A1 should be provided, with detection in the access room and an audible warning on the balcony when the external doors are closed.

4.4.6 Ancillary Accommodation

4.4.6.1 Travel Distances

The travel distance is the actual distance a person needs to travel from any point within a building to the nearest storey/final exit. In accordance with BS9991:2024, the maximum travel distances within each ancillary area of the building are outlined in Table 3.

Table 3 Maximum permitted travel distances within the room or area and to the nearest storey exit

Area	Maximum part of travel distance within the room or area		Total maximum travel distance to the nearest storey exit	
	With only one escape route available (m)	With alternative escape routes available (m)	With only one escape route available (m)	With alternative escape routes available (m)
Engineering services installation rooms	9	18	18	45 ^[1]
Boiler rooms	9	18	18	45 ^[1]
Storage rooms	9	18	18	45 ^[1]
Transformer, battery and switchgear rooms	9	18	18	45 ^[1]
Refuse / Bin stores	9	18	18	45 ^[1]
Cycle stores	9	45 ^[2]	18	45 ^[1]
Rooftop plant	N/A	N/A	60	200

Notes:

1.

This may include up to 18m with escape in one direction only

2.

This may include up to 9m with escape in one direction only

As illustrated in Appendix A – Fire Strategy Drawings, the travel distances in the Car Park Sprinkler Tank Room in the lower ground floor is over the recommended limits outlined in the table above. Specifically, the travel distances are exceeded by approximately 8.4 m in this room. This is considered acceptable based on the following:

- The sprinkler tank room houses low-risk, water-based equipment associated solely with the operation of the commercial sprinkler systems.
- Both areas are intended for access by able-bodied staff or inducted contractors only and will be maintained to a high standard of housekeeping in accordance with the site’s management policy.
- The ancillary accommodation is to be provided with an automatic category L3 fire detection and alarm system, affording early warning of fire.
- According to studies referenced in PD 7974-6:2019, unimpeded walking speeds are typically in the range of 1.2m/s, meaning an additional travel distance of 8.4m equates to an increase in egress time of seven seconds.

However, this is a deviation and is subject to agreement with the Approving Authority and the local Fire and Rescue Service. Alternatively, a secondary means of escape may be provided from the sprinkler car park room via a door provided to the adjacent lobby escaping direct to the external.



4.4.6.2 Escape from Rooftop Maintenance Areas

The development is to contain accessible rooftops to facilitate required maintenance work of rooftop plant, and photovoltaic arrays at both residential blocks.

These areas are to have clearly defined accessible walkways with the design team to ensure consideration of the below:

- Travel distances should align with the recommendations of Table 4;
- Visual alarm devices (e.g., beacons) and sounders should be provided within these areas in accordance with BS5839-1:2025;
- The maintenance walkway should provide a clear width of 900mm for fire safety noting that where other requirements may supersede this under Parts K and or M of the Building Regulations 2010.
- The route is adequately defined and guarded by walls and/or protective barriers conforming to BS 6180:2011 or the relevant edge protection specified in accordance with Part K requirements of which is the responsibility of others;
- Accessible rooftop areas should be provided with emergency lighting and signage in accordance with the specifications and recommendations made with Section 3.1 and 4.8.

4.4.7 Maximum Expected Occupancy

For the purposes of assessing the fire safety design relative to means of escape, Stantec has specified the maximum anticipated occupancy as per Table 4. Where the exact number of occupants will be known by the design team, the anticipated occupancy numbers determined by Stantec Fire as specified in Table 4 should be updated. Stantec are to receive further input following design team review of Table 4.

In accordance with Clause 34b of BS9991:2024, ancillary areas should have sufficient escape capacity for the anticipated number of occupants, calculated from an assessment derived from BS9999:2017 for the appropriate risk profile.

Table 4 Maximum Expected Occupancy

Area	Floor Area (m²)	Floor Space Factor (m²/person)	Maximum Expected Occupancy
Lower Ground Floor:			
Substation	16.6	30	1
LV Switchroom	20.0	30	1
Car Park Sprinkler Tank Room	190.0	30	1
Car Park	47 car spaces	2 person / space	94
Store	23.8	30	1
Store	8.7	30	1
Bin Room	51.4	30	2
Bin Room	52.9	30	2
Cycle Store	122.9	30	5
Lower Ground Floor Total			108
Ground Floor:			
Southwest Block Flats	N/A	No. of Beds	18
Comms	22.0	30.0	1
Northeast Block Flats	N/A	No. of Beds	18