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FIRE ENGINEERING

ADDISON ESTATE

ADDISON ESTATE, 702 FIELD END ROAD, LONDON, HA4 0QP

OUTLINE FIRE SAFETY STRATEGY

FIRE SAFETY STRATEGY					
ISSUE	DATE	AUTHOR	REVIEW	VALIDATED	General comments/ Amendments
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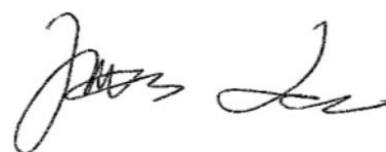
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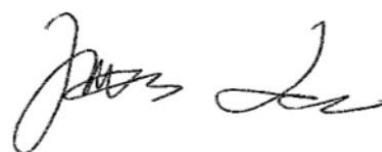
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1. EXECUTIVE SUMMARY

CHPK Fire Engineering (CHPKFE) has been appointed by Kings Oak Capital to produce an outline fire safety strategy for Addison Estate located in London.

BS 9991 has been considered as the main guidance document regarding other British Standards, it should be noted that all British or EU standards references refer to the most recently issued iteration as of the date of this report.

Table 1: Fire Safety Design Elements

FIRE SAFETY ELEMENT	DESCRIPTION
Evacuation philosophy	Means of escape in residential flats will be based on the 'stay put' strategy.
Fire detection and alarm system	The fire detection and warning system within the residential flats will be installed and designed following BS 5839 Part 6. This should be to a minimum Grade D1 LD2 standard. Residential common corridors, stair lobbies, and protected stair will be fitted with a Category L5 fire alarm system designed and installed following BS 5839-1.
Means of escape	Horizontal and vertical means of escape (including travel distances) will comply with the required prescriptive guidance (BS 9991).
Smoke ventilation system	Natural smoke ventilation to the residential stairs (1m ² geometric free area at the head of the stairs) will be provided. Depending on the layout design, the residential common corridors may need to be ventilated via a 1.5m ² automatic openable vent (AOV). To be confirmed as design progresses.
Emergency lighting	Emergency lighting shall be provided following BS 5266 Part 1 and BS EN 1838.
Exit signage	Exit signage shall be provided following BS ISO 3864 Part 1 and Health and Safety (Safety Signals and Signs) Regulations
Fire Compartmentation	Fire compartmentation is provided following BS 9991.
Structural Fire Protection	The height of the building is greater than 5m but less than 18m therefore the loadbearing elements of structure shall be protected to offer 60 minutes fire resistance in accordance with BS 9991.
Secondary power supplies	Secondary power supplies shall be provided to feed all life safety systems that require electricity to function as intended. All power and control cabling required for life safety equipment should be specified and installed in accordance with BS 8519.

A fire statement has been produced for this scheme and the client has requested an independent fire strategy to detail the following items.

1. The building's construction: methods, products and materials used.
2. The means of escape for all building users: stair cores, escape for building users who are disabled or require level access, and the associated management plan approach.
3. 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 ventilation systems proposed, and the ongoing maintenance and monitoring of these.



2. INTRODUCTION

CHPK Fire Engineering (CHPKFE) has been commissioned by Kings Oak Capital to carry out an outline fire safety strategy for Addison Estate in London. The objective of the fire strategy is to demonstrate that an acceptable level of fire safety is achieved. The fire safety design applied to the building has been undertaken mainly regarding BS 9991 and the relevant British Standards.

2.1 BUILDING DESCRIPTION

The proposed works involve a commercial unit is being refurbished into a block of residential flats (G+2) with an approximate height of 5.4m from fire access level. The works constitute a refurbishment (conversion from a commercial unit to a residential block of flats).

The residential apartments are served by a single stair and internal residential common corridor. The building contains one regular platform lift which serves all levels.

The building is intended to be constructed from

- brick walls
- aluminium framed double-glazed windows
- reinforced concrete foundations, with concrete beam and block floors.
- steel frame
- GRP roof with aluminium rainwater goods



Figure 1 – Proposed GA plans

2.2 DRAWING FILES AND DOCUMENTATION

The following relevant information provided by was provided by the client in the compilation of this report.

Table 2: Drawings reviewed.

Document	Revision	Date	Drawing Description
PL101	-	Sep 2022	Proposed residential flats plans
PL100	F	Oct 2022	Site plan

3. LEGISLATION AND GUIDANCE DOCUMENTS

3.1 BUILDING REGULATIONS

The building will be subject to approval under the Building Regulations 2010 as modified by the Building (Amendment) Regulations 2018.

That will require the design and construction to comply with the functional Requirements as shown below.

- 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 fire service

To demonstrate compliance with functional Requirements B1 to B5, it is conventional to base the design on standard fire safety design documents. Variations to the guidance given in those documents are permitted, as long as it can be demonstrated to have still met the functional requirements shown above.

It is to be noted that amendments were made to Approved Document B – Volume 1 in June 2022. The changes take effect on 1st December 2022. The current 2019 edition (with 2020 amendments) continues to apply where a building notice or an initial notice has been given to, or full plans deposited with, a local authority before 1st December 2022 and either the building work to which it relates: a) has started before that day; or b) is started within 6 months of that day.

- External wall surfaces in all residential buildings (purpose groups 1 and 2) with a storey 11m (or more) in height should achieve a minimum Class A2-s1, d0. Any insulation, filler materials, etc should be Class A2-s1, d0 (or better).
- Reference made to Regulation 7(1A) which prohibits the use of relevant metal composite materials in the external walls and specified attachments of all buildings in any height. Definition of “relevant metal composite material” provided in the amendment document.
- A new recommendation for secure information boxes in blocks of flats with storeys over 11m

As this building will have a topmost occupied storey is less than 11m, only regulation 7(1A) will apply to this building.

In addition, under changes introduced in the Building (Amendment) Regulations 2018, for buildings classified as “relevant buildings”, Regulation 7(2) (and other modified Regulations) applies additional criteria on the combustibility of materials within the external walls. “Relevant building” is defined as a building with a storey greater than 18m in height (excluding roof-top plant areas and storeys consisting solely of plant rooms) and contains one or more dwellings, an institution, or a room for residential purposes (excluding rooms in hostels, hotels, or boarding houses).

This building is not defined as a “relevant building” and the additional requirements needed under Regulation 7(2) are not required.

This report has based the design of the building on BS 9991 and the relevant British Standards.

In situations where the building design varies from the guidance in that document, that has been highlighted and justified in this report.

This report describes the main fire safety issues relating to the building. In any areas that are not mentioned in this report, the design should comply with the guidance of the relevant guidance documents mentioned above.

3.2 REGULATORY REFORM (FIRE SAFETY) ORDER 2005

The Regulatory Reform (Fire Safety) Order came into force in England and Wales on 1st April 2006. Once completed, the building will be subject to the Fire Safety Order. That will require the Responsible Person for the building to ensure that a fire risk assessment has been carried out by a competent person.

This report (or subsequent updated versions of this report) could be used to assist in that fire risk assessment.

3.3 CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015

Projects undertaken in the United Kingdom are subject to the requirements of the Construction (Design and Management) Regulations 2015 (CDM). The CDM Regulations require that the design of the building should ensure that it can be constructed and managed safely.

This report deals with the fire safety design of the building when completed to meet the functional and performance requirements for fire safety. It does not address fire safety during construction.

Where conclusions or recommendations are contained in this report, and which specify particular materials, products, or forms of construction these will have been assessed following the CDM Regulations. If these involve significant risks or health and safety critical assumptions, this information will be made available to the Principal Designer.

There are many standard guidance documents available giving guidance on managing fire safety within construction sites (such as HSG168 produced by the HSE) and so the relevant main contractor will need to ensure that the construction site complies with that guidance.



4. B1 – MEANS OF WARNING AND ESCAPE

4.1 EVACUATION STRATEGY

The evacuation philosophy for the residential flats is based on a 'stay put' strategy. The occupants of the flat of fire origin be warned to evacuate. The remaining flats will stay put and further evacuation will be at the discretion of the building management and the fire service. However, all occupants can choose to leave at their discretion if it is safe to do so.

4.2 MEANS OF WARNING

It should also be noted that "Grade D" references in BS 5839-6:2013 is now obsolete. In the up-to-date iteration BS 5839-6:2019 the relevant grades are now:

- Grade D1: Recommended in rented dwellings (new or existing); units are served by tamper-proof batteries.
- Grade D2: Recommended for owner-occupiers only.

For further detail please refer to BS 5839-6: 2019. Considering the above it is proposed to upgrade the fire alarm system to Grade D1 for all residential units as owner occupiers may in the future decide to let out their property in which case a condition would be needed to ensure the FDAS (fire detection and alarm warning system) is upgraded from Grade D2 to Grade D1. The fire and alarm detection system in the following areas in the building are to be as follows:

- Single-level apartments with protected entrance halls - A Grade D1 Category LD2 system to be provided following BS 5839-6 recommendations.
- Residential common corridors - Residential common corridors and the protected stair that serves all levels in the building, will be fitted with a Category L5 fire alarm system designed and installed following BS 5839-1 recommendations. Detectors are to be installed in the common corridors/protected stair on each floor to actuate automatically opening vents (AOV) as described in this report.

The operation and effectiveness of the fire alarm system over the entire building should be routinely checked (weekly) and tested by a nominated and competent person and periodically serviced and any necessary rectification or repair carried out by a competent person having the appropriate level of training and experience.

The fire detection and alarm system installer should submit a certificate confirming the system complies with the recommendations of BS 5839-6 on completion of the installation and commissioning work on each of the dwelling systems.

When the fire and rescue service arrives at the premises, a primary control panel is to be available following BS 8629 which the fire service can use to support firefighting and rescue operations. Fire alarm surveys should be carried out by a competent person to confirm the cause-and-effect matrix for the means of warning system is adequate.

4.3 HORIZONTAL MEANS OF ESCAPE

- Exits should achieve a minimum clear effective width of 750mm and, 850mm where unassisted wheelchair access is necessary.
- The minimum clear height on escape routes should be 2.0m.

The design of residential accommodation is not led by the number of occupants expected in the building as a residential accommodation strategy is premised upon a defend-in-place protocol. Therefore, only occupants in the apartment of fire origin will make their immediate escape with other occupants evacuating at their own pace or as directed by the attending fire service.

Maximum allowable travel distance limits are summarised in Table 3.

Table 3: Travel distance limits

Location	Permissible Travel Distance
Common corridors	4.5m 7.5m (if a smoke ventilation system is provided)
Apartments with protected entrance halls	9m

4.3.1 MEANS OF ESCAPE – FROM APARTMENTS

All apartments are provided with protected entrance halls, and as such the protected entrance halls should achieve 30 minutes fire resistance and the doors into the protected entrance hall will be FD30 fire doors.

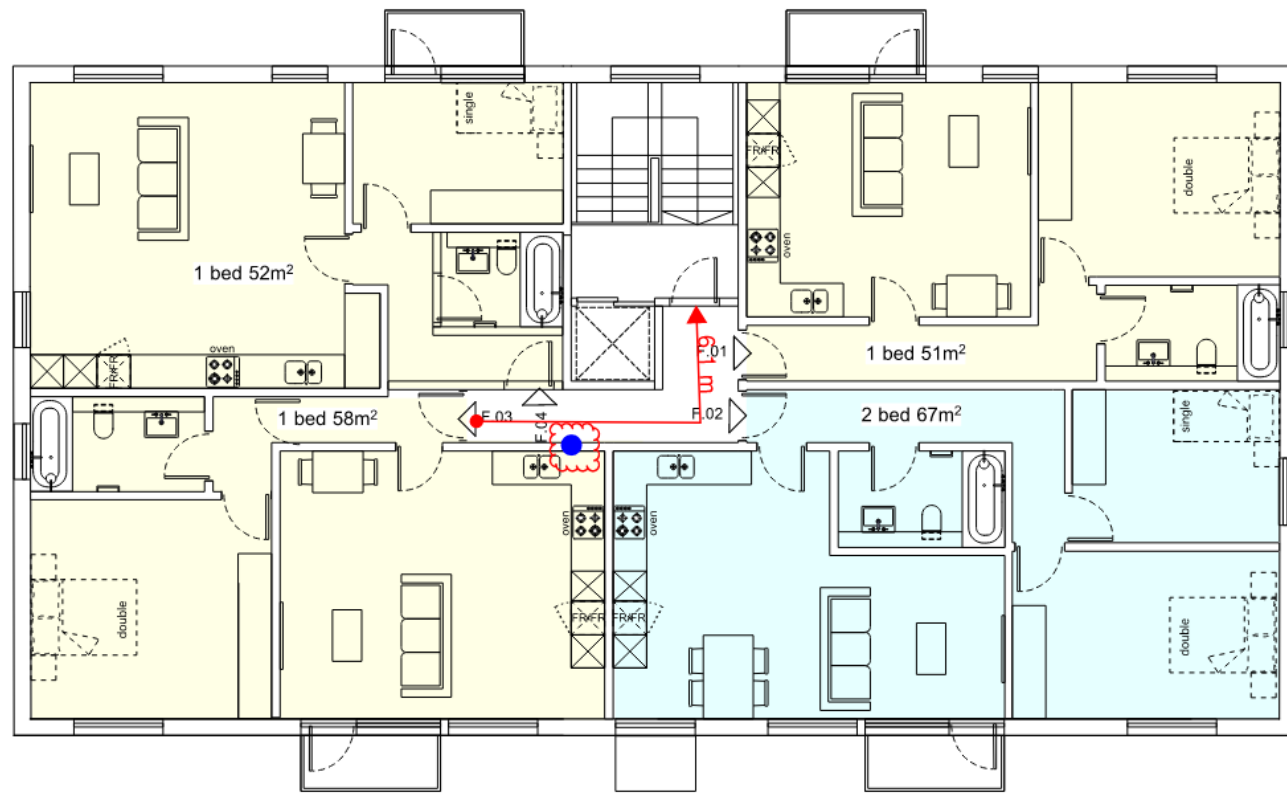
All residential apartments should be following BS 9991 recommendations which are:

- Travel distances from a habitable room to the flat entrance door should not exceed 9m.
- Cooking facilities are to be remote from the main entrance door and should not impede the escape route from anywhere in the flat.

4.3.2 MEANS OF ESCAPE – IN COMMON AREAS OF THE BUILDING

The common area escape in Addison Estate is via internal corridors that link to the escape stair. Per Figure 8, the maximum travel distance from the flat entrance door to the stair should not exceed 4.5m.





103 PROPOSED FIRST FLOOR PLAN
Scale: 1:100

Figure 2 - Extended travel distances from first floor level

As shown by Figure 2, there are extended travel distances from the first-floor level and as such the client should consider the following options to comply with the prescriptive guidance recommendations

- Provide 1.5m² AOV to the residential common corridors on all floor levels or;
- As shown by the blue circle in the red cloud, move the flat entrance door to this location so that it is within the 4.5m to the stair as per the prescriptive guidance recommendations.

4.4 VERTICAL MEANS OF ESCAPE

The topmost storey of the building is approximately 5.4m above the fire access level. The current stair width of c.1,100mm which is sufficient for both means of escape and firefighting access. The escape stair should be provided with an OV (open-able vent) at the head of the stair that is sited at as high a level as is practicable on the top storey of the stairway, having a minimum geometric free area of 1 m².

4.5 EVACUATION OF THE MOBILITY IMPAIRED PERSONS

The floor area of the dwelling is less than 1,000m² and the development consists of less than 10 flats; therefore, the works are not classified as a major development. Part B of the London Plan Policy D12 in this instance is not applicable to this proposal and therefore the London Plan Policy does not require this building to contain an evacuation lift, refuge area or any other evacuation equipment.

There is no requirement in Building Regulations to provide specific evacuation measures i.e., refuge spaces for mobility impaired persons in residential blocks. This is on the basis that a high degree of fire compartmentation in the building to support 'stay put' strategy and mobility impaired persons should be able to gain assistance from neighbouring residents.

Disabled refuges are not required in escape stairs where a 'defend in place' fire safety strategy is employed. Disabled occupants would be expected to wait within their apartments during a fire incident elsewhere within the building. In the event of a fire within their apartment, suitable space is available for waiting within the common parts of the building prior to exiting via the stair.

4.6 EMERGENCY ESCAPE SIGNAGE

Fire signage is only required in the common areas of the apartments. It is not needed within the boundaries of an apartment. Emergency escape signage should be provided following BS ISO 3864, Health and Safety (Safety Signals and Signs) Regulation 1996.

4.7 EMERGENCY LIGHTING

No emergency lighting is required in the flats. However, emergency lighting in common areas, car park, and plant areas will be installed and provided following BS 5266 Part 1 and Part 7, supplied with standby power. This includes the coverage as outlined in Table 4.

Table 4: Emergency lighting coverage

ACCOMMODATION	COVERAGE
Residential	<ul style="list-style-type: none"> • Stair • Toilet with a floor area over 8m² • Windowless accommodation • Open-plan areas of more than 60m²



5. B2 – INTERNAL FIRE SPREAD – LININGS

5.1 MATERIAL CLASSIFICATIONS

To inhibit the spread of fire within the building, surface finishes and floor coverings should not comprise materials that might contribute to the surface spread of flame and/or fire or adversely affect the means of preventing such propagation.

The specification of lining materials will be following the guidance in BS 9991 and is shown in Table 5 .

Table 5: Classification of linings

Location (residential)	EUROPEAN Class ^{Note 1}
Small residential rooms ≤ 4m ²	D-s3,d2
Circulations spaces within dwellings	C-s3, d2
Other areas	C-s3, d2
Other circulation spaces including the common areas of blocks of flats	B-s3, d2

Note:
1 European Class would relate to the material's classification in accordance with BS EN 13501. When a classification includes "s3, d2", this mean that there is no limit set for smoke production and/or flaming droplets/particles



6. B3 – INTERNAL FIRE SPREAD (STRUCTURE)

6.1 STRUCTURAL FIRE RESISTANCE

The topmost occupied storey level is approximately 5.4m from the fire access level and as such, elements of structure for buildings with an occupied floor height >5m and <18m above the access level should be 60-minutes fire resistance construction in order to comply with BS 9991. The elements of structure are as follows:

- Structural frames.
- Beams.
- Columns.
- Load-bearing walls.
- All floors.

Any remediation of existing construction/installation of fire-stopping systems should be carried out and certified by a competent contractor having the appropriate level of training and experience appointed to undertake the work.

A structure that only supports a roof does not need any specific fire resistance unless it also supports a fire-resisting wall or rooftop plant.

Any products relating to fire safety used in the construction of the building will have the appropriate testing and classification.

6.2 COMPARTMENTATION

The fire resistance performance of compartment walls and floors (or any other parts of the building which are required to prevent fire spread) It should be not less than that specified in Table 6 when tested following the relevant part of BS 476: Parts 20 to 24 or classified following BS EN 13501 Parts 2, 3 or 4.

Any items not highlighted in Table 6 would be following ADB.

Table 6: Fire compartmentation requirements

ELEMENT	FIRE RESISTANCE RATING <small>Note 1, 2, 3,5</small>	FIRE DOOR <small>Note 4</small>
Compartment Floors	60 minutes	N/A
Compartment walls to apartments	60 minutes	FD30S
Protected shafts	60 minutes	FD30S
Service risers	60 minutes	FD30S
Walls enclosing any electrical substations	120 mins*	FD120
Note 1. Loadbearing walls, for load-bearing capacity, integrity, and insulation from either side 2. Non-load-bearing walls and partitions, for integrity and insulation from either side 3. Floors, for load-bearing capacity, integrity, and insulation for exposure of the underside only. 4. Fire doors for integrity from either side, except for doors to lift enclosure where performance is in respect of exposure of the landing side only 5. All stairs/lifts serving the residential accommodation (ground – fourth-floor level) are to be designed as fire-fighting shafts.		

ELEMENT	FIRE RESISTANCE RATING <small>Note 1, 2, 3,5</small>	FIRE DOOR <small>Note 4</small>
Note: * - Not part B requirements should be considered by the Architect, which we understand could be 240 minutes or more.		

All floors should be constructed as compartment floors and each apartment should be formed as a compartment, as recommended in BS 9991, with the door to the common corridor achieving FD30S.

All shafts (e.g., risers, lift shafts, and stair cores) are to be constructed as protected shafts and will need to meet the full structural fire resistance, including shaft doors and grilles.

Doors in compartment walls should achieve the same standard of fire resistance as the wall into which they are fitted unless they form part of a lobby in which case the pair of doors can each have half the period of fire resistance of the wall so that the combination achieves the overall fire rating.

Each apartment will be fire separated from the common areas and each other by construction having a minimum fire resistance of 60 minutes. Each apartment front door will be a minimum FD30S self-closing door.

Internally within each apartment the entrance hall (where applicable) that connects each room to the main entrance door will be constructed as a protected hallway achieving a minimum of 30 minutes of fire resistance with FD30 doors (no self-closers or smoke seals are needed).

Any electrical substations will be separated from adjacent residential accommodation via 240 minutes of fire resistance to meet UKPN specifications.

6.3 PROTECTION OF OPENINGS AND FIRE-STOPPING

All pipes, ductwork, and services passing through fire-resisting barriers should be penetration sealed with an appropriate sealing system and/or fire/smoke damper which has been shown by an appropriate test or assessment to maintain the period of the fire resistance of the barrier. The penetration sealing system should be designed and installed following the recommendations contained within The Association for Specialist Fire Protection (ASFP) "Fire Stopping & Penetration Seals for the Consultation Industry" (commonly referred to as The Red Book).

Ventilation ductwork provides a route for fire and smoke to spread through the building. The ductwork passing through compartment walls or floors should be either contained within fire-resisting construction or provided with fire dampers. Fire dampers should achieve the same level of fire resistance as the element through which it passes. Dampers on ductwork that pass into protected escape routes should be installed as motorized fire and smoke dampers and actuated by the building fire alarm and detection system.

Pipes will be fire-stopped with proprietary seals or sleeving 1m on either side of the fire-resisting construction with non-combustible material when the dimension of the pipe exceeds the dimensions in Table 7.

Where ducts penetrate through fire-resisting construction protecting escape routes, fire and smoke dampers that are activated upon smoke detection (ES-type dampers) should be provided, or the duct should be constructed from fire-resisting construction or enclosed within fire-resisting construction (this includes shaft doors and grilles).

Any ductwork passing through compartment lines shall be fire rated to the same specification as the element through which it passes (i.e., in terms of integrity and insulation); or provided with suitably rated fire (and smoke) dampers, where possible. Where a ductwork system serves more than one part of a compartmented or fire-separated protected escape route, motorised fire, and smoke dampers shall be provided where ductwork enters each fire-separated or smoke-separated section of the escape



route. Access hatches must be provided to allow for the maintenance of any fire dampers.

Table 7: Maximum nominal internal diameter of pipes passing through a compartment wall/floor

SITUATION	PIPE MATERIAL AND MAXIMUM NOMINAL INTERNAL DIAMETER		
	(a) Non-combustible material	(b) Lead, aluminium, Upvc, aluminium alloy, fibre cement	(c) Any other material
Structure (but not a wall separating buildings) enclosing a protected shaft which is not a stairway or lift shaft	160 mm	110mm	40mm
Compartment wall or compartment floor between flats	160 mm	160 mm (stack pipe) 110 mm (branch pipe)	40 mm
Any other situation	160 mm	40mm	40 mm

Any fire and smoke control assemblies should be provided with an appropriate certificate from a recognised third-party accreditation body to demonstrate compliance with Regulation 38 of the Building Regulations 2010. Assessment and test evidence should also be available for inspection by the approving authorities and other interested parties.

6.4 FIRE DOORS

Fire door rating should be following Table 6. Any fire doors should be fitted with self-closing fire doors, so they return to the closed position, except for internal doors within dwellings, cupboards, and doors into service risers which are kept locked shut. Fire doors should be capable of demonstrating compliance with the relevant standard when tested as a completely installed assembly. It is a requirement that the manufacturers are to have the fire doors assessed by a test procedure as specified in BS 476 Part 22 or BS EN 1634. Figure 3 depicts the door components.

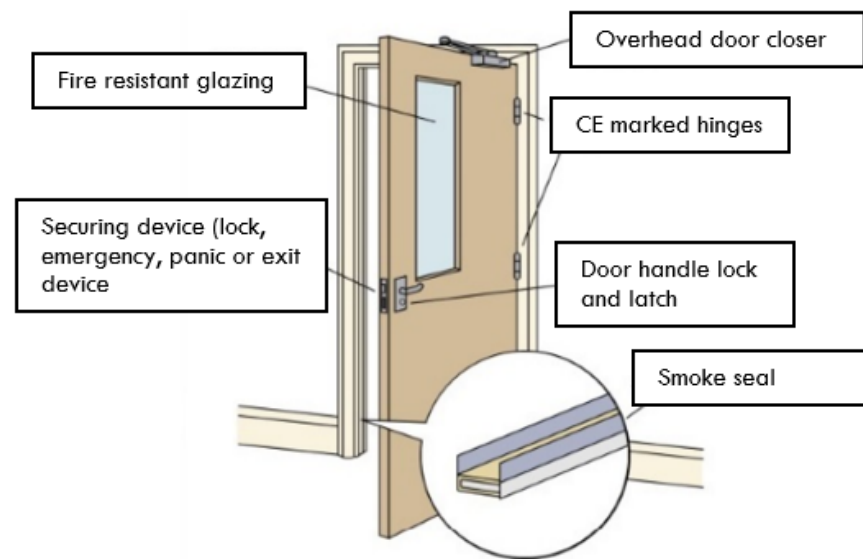


Figure 3 - Fire door components

Magnetic hold-open devices should be employed on doors in common areas where such doors are expected to be rendered ineffective by occupants – i.e., chocked open or continued overuse. These should be linked to the fire alarm system/local automatic smoke detection so that the doors are released to the closed position in the event of a fire.

6.5 CAVITY BARRIERS

Cavity barriers should be provided in all areas following BS 9991. Cavity barriers should be provided to limit the extent of any unseen cavities to no more than 10m (which can be increased to 20m if all the surfaces within the cavity achieve a UK Class 1 or European Class C performance or better). It should be noted that this normally only applies to non-domestic buildings, but it is recommended that this restriction should apply to all types of buildings.

To prevent extensive cavities, concealed cavities i.e., the void between a suspended ceiling and the soffit of the floor above, raised floors that are used for services etc. will require cavity barriers typically installed so as to observe a 20m maximum linear dimension. This includes cavities in external walls where compartment walls or floors abut to the external wall.

Within external walls, cavity barriers should be provided in line with any locations where fire rated walls or floors meet the façade.

Cavity barriers should also be provided around all openings in the external walls, such as windows, doors and service penetrations and at the top and bottom of the cavity. Cavity barriers should be provided around service penetrations through the external walls in accordance with Building Control Alliance (BCA) Technical Guidance Note 26.

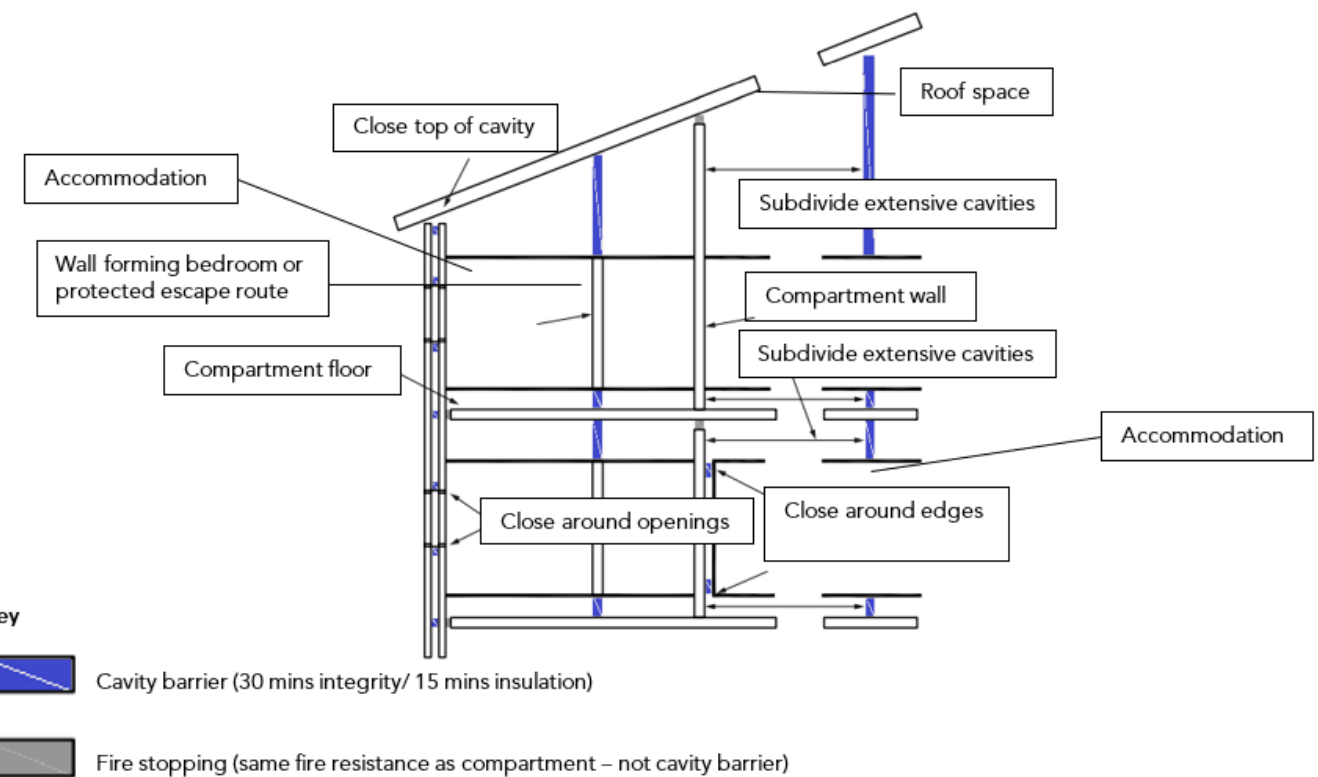


Figure 4 - Provision for cavity barriers

Cavity barriers in external walls should pass through all insulation and other materials within the external wall, forming a seal



between the edge of the fire-rated wall/floor and the inner face of the external cladding. If the external cladding comprises composite panels which contain materials that are not of limited combustibility, the cavity barrier should be extended to continue through the core of the external panel as well (to prevent the combustible core of the panel from bypassing the cavity barrier).

Cavity barriers should achieve a fire resistance of at least 30 minutes for integrity and 15 minutes for insulation.

Alternatively, if located in a stud wall or partition, or provided around openings in the external wall, they may be formed of:

- a. Steel at least 0.5mm thick
- b. Timber at least 38mm thick
- c. Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
- d. Calcium silicate, cement-based, or gypsum-based boards at least 12mm thick.

Fire stopping (the seal between the fire-rated wall/floor and the external wall) should be of the same fire resistance as the fire-rated wall/floor.

Furthermore, cavity barriers are to be provided at:

- At the junction between an external cavity wall and every compartment floor and compartment wall;
- At the junction between an internal cavity wall and every compartment floor, the compartment wall or other wall or door assembly forms a fire resisting barrier.
- Around the edges of cavities, including around openings such as windows, doors, and entry/exit points for services.



7. B4 – EXTERNAL FIRE SPREAD

7.1 UNPROTECTED AREAS

To prevent external fire spread from and to adjacent buildings, the Building Regulations place limits on the area of external elevation with no fire resistance. This area is known as the 'unprotected area' and is affected by such factors as distance from the boundary, use of the building and compartment size.

60 minutes fire resistance (integrity and insulation) from both sides will be required for walls within 1000mm of the site boundary. The Building Regulations accept small openings (up to 1 m²) in the external wall provided it meet Figure 21 of BS 9991.

Figure 21 Exclusions from unprotected area calculations

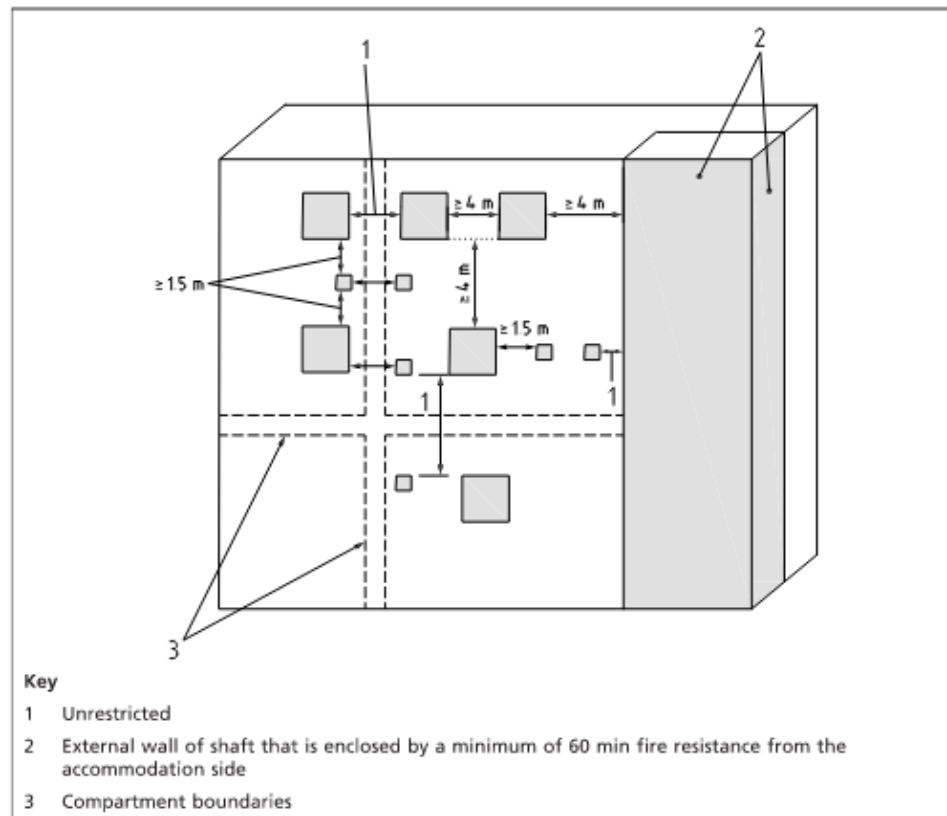


Figure 5 - Exclusions from external fire spread.

For other openings, the largest compartment on each façade is chosen for the external fire spread analysis as these will give the greatest exposure hazard. The external fire spread assessment is based on the enclosing rectangle method in BRE Report BR187 External fire spread: building separation and boundary distances. This is a suitable method for calculating minimum boundary distances or maximum unprotected areas, as referenced in BS 9991. Boundary locations are taken as the centre of a public highway, the boundary of the site or a notional boundary mid-way between buildings on the same site (as Regulation B4 is concerned with the heat flux at half the distance between buildings).

External fire spread assessment has been carried out with the given available information presented by the client and using the information presented in BR 187.

As shown via the site plan, can advise that considering BR 187 Table A and a conservative enclosing rectangle of 3m (height) x 12m (width) , 3.5m would be required from each elevation to the relevant boundary to enable 100% unprotected areas. All elevations can be provided with 100% unprotected areas, as all elevations are further than 3.5m to the relevant boundary line.

7.2 EXTERNAL WALL SURFACE AND REGULATION 7

Due to the height of this building, BS 9991 imposes no provisions for the fire performance of the external surfaces of the walls. Building Regulations does not give any recommendations restricting the combustibility of materials used within external walls however the Building Regulations does require that the building's external wall should not act as a medium for fire spread which would impact upon occupant's health and safety. It is recommended against the use of combustible materials in any part of the external walls of the building.

7.3 EXTERNAL ROOF CONSTRUCTION

All new or modified external roof coverings present should achieve a minimum AA, AB or AC (National Class) or a B_{Roof (t4)} (European classification), as there are flats less than 6m from the site boundary.

8. B5 – ACCESS AND FACILITIES FOR FIRE SERVICE

To extinguish a fire within this building it is important that the fire service can gain access to the premises, and from there, into the building. This section deals with the various facilities intended to aid the fire service access to the building and in fighting a fire in the building.

8.1 VEHICLE ACCESS

Vehicle access will be provided within 18m of the building entrance as recommended in BS 9991. Hose laying distances from the most remote point in the building to a fire appliance is less than 45m and as such dry risers are not required within this building.

Fire and rescue service vehicles should not have to reverse more than 20m from the end of an access road. Dead-end access routes longer than 20m will require turning facilities e.g., turning circle, hammerhead, or another point at which vehicle can turn. Per the GN 29 fire safety guidance note, see the following vehicle access requirements below:

Table 8 – Vehicle access requirements

APPLIANCE TYPE	MINIMUM WIDTH OF THE ROAD BETWEEN KERBS	MINIMUM WIDTH OF GATEWAYS	MINIMUM TURNING CIRCLE BETWEEN KERBS	MINIMUM TURNING CIRCLE BETWEEN WALLS	MINIMUM CLEARANCE HEIGHT	MINIMUM CARRYING CAPACITY
Pump	3.7m	3.1m	16.8m	19.2m	3.7m	14 tonnes
High Reach ^{Note 1}	3.7m	3.1m	26m	29m	4m	23 tonnes
Special appliance	4.0m	3.1m	26m	29m	4.27m	32 tonnes

Note
1. The weight of high-reach appliances is distributed over some axles and their infrequent use of a carriageway or route designed for 12.5 tonnes is not likely to cause damage. It would be reasonable to design the road based on 12.5 tonnes although structures such as bridges should have the full 17 tonnes capacity.

8.2 HYDRANTS

BS 9991 recommends fire hydrants should be provided within 90m of every entry point to the building. The hydrants should be designed following BS 9990.

Where fire hydrants are to be installed, they should be included as part of a ring fire main system. They should preferably be sited immediately adjacent to roadways or hard-standing facilities suitable for fire and rescue service appliances.

To ensure that the hydrants remain usable during a fire they should be sited with consideration of the effect that falling debris and other possible occurrences during a fire might have an effect. Each hydrant should be indicated by a plate, affixed nearby in a visible position, following BS 3251:1976A.1.13.

The hose cover distances within the residential flats should be limited to 45m. Hose cover distances from the most remote point to a fire appliance is less than 45m and as such meets the limits as recommended in the prescriptive guidance.



Figure 6 – Vehicle access route

9. FIRE SAFETY MANAGEMENT

Regulation 38 of the Building Regulations requires that where work involves the erection or extension of a relevant building or relevant changes of use of a building, fire safety information such as this fire strategy document be brought to the attention of building management and incorporated into the fire risk assessment that will be carried out post-occupation under the Regulatory Reform (Fire Safety) Order together with staff training, maintenance of fire safety systems and documented.

A detailed record should be provided of the fire strategy and procedures for operating and maintaining any fire protection measures. Records should include:

- Fire safety strategy (including design assumptions);
- Means of escape for mobile and mobility impaired persons;
- Escape strategy;
- Muster points;
- All passive fire safety measures e.g., compartmentation, cavity barriers, fire door sets, duct dampers, fire shutters;
- Fire/smoke detectors, alarm call points, detection/alarm control boxes, alarm sounders, emergency communication systems, CCTV, fire safety signage, emergency lighting, fire extinguishers, fire mains, and other firefighting equipment;
- Other interior facilities for the fire and rescue service;
- Emergency control rooms;
- Locations of hydrants outside the building;
- Other exterior facilities for the fire and rescue service;
- Active fire safety measures such as sprinkler system design, smoke control system or heating, ventilation, and air conditioning systems with a smoke control function design, including mode of operation and control systems;
- High-risk areas and particular hazards;
- As built drawings;
- Specifications of any fire safety equipment (including operational details, manuals, software, system zoning, and routine inspection, testing, and maintenance schedule);
- Records of commissioning tests; and
- Other details appropriate for the building

The Regulatory Reform (Fire Safety) Order 2005 requires that the systems provided for fire safety are maintained in good working order at all times. This includes firefighting equipment together with other facilities

The management team needs to ensure that the building fabric and fire protection measures are maintained throughout the life cycle of the premises.

All fire safety systems, installations, and equipment should be maintained following the manufacturer's recommendations.

10. REFERENCES

1. Building Regulations, Approved Document B – Volume 1, 2019, Fire Safety: Dwellings
2. BS 9991:2015, Fire safety in the design, management, and use of residential buildings – Code of practice
3. BS 5839 Part 6: 2019, Fire detection and fire alarm systems for residential buildings. Code of practice for system design, installation, commissioning and maintenance, BSI
4. BS 5839 Part 1: 2017, Fire detection and fire alarm systems for non- residential buildings. Code of practice for system design, installation, commissioning and maintenance, BSI
5. BS 5266 Part 1, Emergency lighting. Code of practice for the emergency lighting of premises, 2016, BSI
6. BS EN 1838, Lighting applications. Emergency lighting, 2013, BSI
7. BS ISO 3864 Part 1, Graphical symbols. Safety colours and safety signs. Design principles for safety signs and safety markings, 2011, BSI
8. BS 476 part 20 -24: Fire Tests on Building materials and structures
9. BS EN 13501 part 1 -5 : Fire classification of construction products and building elements,
10. BR 187, External fire spread: building separation and boundary distances, 2014, BRE
11. GN 29: LFEPA Fire safety Guidance Note – Access for fire appliances
12. BS 9990: Non automatic fire fighting systems in buildings
13. BS 3251: Specification Indicator plates for fire hydrants and emergency water supplies
14. BS 8519, Selection and installation of fire-resistant power and control cable systems for life safety, fire-fighting and other critical applications. Code of practice, 2020, BSI

11. LIMITATIONS

Our advice is strictly limited to the scope of our current brief, i.e., to fire strategy report within Addison Estate. Complying with the recommendations of this document will not guarantee that a fire will not occur. This document is based on the drawings and supporting information issued to CHPK Fire Engineering by the client.

CHPK Fire Engineering Ltd has not reviewed any other issues within the project other than those identified in our report. We offer no comment on the adequacy or otherwise of any other aspects of the development (whether related to fire safety or any other issue) and an absence of comment on such issues should not be regarded as any form of approval. The advice should not be used for buildings other than that named in the title.

