

BEAM PARK

Fire Statement – Addressing Condition 70 of Planning Permission GLA/2933a/05 Relative to Phase 2A

Phase 2A Reserved Matters Application (Works within the London Borough of Havering) -
Submission to the GLA

July 2019



SUPPORTED BY
MAYOR OF LONDON

Beam Park – Phase 2A
Outline Fire Strategy Report
Revision 01

PROJECT DETAILS

Client
Title

Countryside Properties
Beam Park Phase 2A
Outline Fire Strategy Report

Current Revision

01

Revision History

Rev	Date	Description	By	Approved
00	16/07/2019	First Issue	H. McDaid	J. Harris
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1 Introduction

1.1 General

Mendick Waring have been appointed by Countryside Properties to provide fire engineering services on the proposed Beam Park Phase 02 development.

This document is confidential and for exclusive benefit of Countryside Properties (the Client). This report has been produced, based on the information available at the time of preparation. It is applicable to the above-mentioned project only in accordance with the client's instructions. It is only valid provided no other modifications are made other than those for which a formal opinion has been sought and given by Mendick Waring.

1.2 Purpose of the Report

The objective of this report is to develop a Fire Safety Strategy (FSS) which demonstrates that the 5 functional requirements of Part B of the Building Regulations 2010 has been met.

This report is intended to:

- Demonstrate how the fire safety design of the proposed development can meet the requirements of Part B of the Building Regulations 2010;
- Provide fire safety engineering advice using the guidance contained in BS 9991:2017 and other supporting documentation.
- Highlight areas of the design that deviate from the guidance documents and propose solutions to ensure that the requirements of Part B are satisfied;

This document will therefore act as the basis of discussions between the design team and Approval Authorities, in order to obtain approval for the design in respect to fire safety compliance.

This report and design approach is tailored towards the life safety of the building occupants only and does not specifically include any third party or property protection measures / requirements.

1.3 Project Background and Specifics

1.3.1 General

Phase 2A of the Beam Park development shall consist of 2 new-build residential apartment blocks, labelled I & T. A brief description of each block is given below:

- **Block I:** A residential development with two single-stair residential cores with building heights (measured from ground level to finished floor level of the top storey) assumed as following:
 - Core 1 connects 6 floor levels (G+5) with a building height of 16.6m.
 - Core 2 connects 8 floor levels (G+7) with an estimated building height of 23m.
- **Block T:** A seven-storey (G+6) residential development with a single-stair arrangement. The building height (measured from ground level to finished floor level of the top storey) is approximately 18.9m.

1.4 Sources of Information

The information contained in this report is based on the information produced by Patel Taylor Architects.

Table 1: Sources of Information

Drawing Number	Title	Rev
448-PTA-I-ZZ-DR-A-1100	Building I – GLA Phase 2A Floor Ground Floor	P03
448-PTA-I-ZZ-DR-A-1103	Building I – GLA Phase 2A RMA Floor Levels 01-07	P03
448-PTA-T-ZZ-DR-A-1101	Building T – GLA Phase 2A Floor Typical GA plans	P02

Note: Any images contained in this report is for indicative purposes only and may not fully reflect the final layout arrangement.

2 Statutory Requirements

2.1 Building Regulations Functional Requirements

This development is subject to the statutory requirements of the Building Regulations 2010. It is therefore necessary for the building to meet the functional requirements of Part B of Schedule 1 of these Regulations.

The 5 functional requirements of Part B of the Building Regulations relate to:

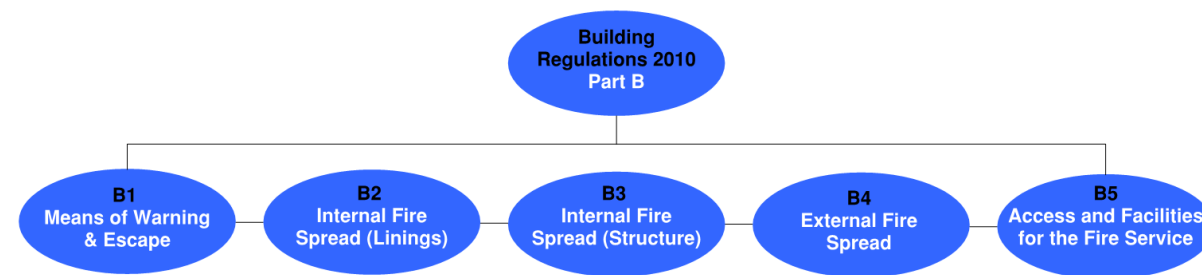


Figure 1: Building Regulations 2010 Part B

2.2 Fire Safety Guidance

Compliance with the Building Regulation requirements shall be achieved by following the guidance of BS 9991 where appropriate and supplementing this with fire engineering solutions when necessary to ensure that the key fire safety objectives for the design are achieved.

This legislation is primarily concerned with life safety and property protection is not specifically considered although the fire protection provisions to be provided for the building will offer some degree of property protection.

On the basis that the recommendations made within the guidance documents are followed, it is considered that the Requirements of the Building Regulations 2010 will be fulfilled; and that an adequate level of fire safety will be provided throughout the premises.

Any third-party (e.g. insurance, cultural heritage or environmental) requirements have not been specifically included.

2.3 Fire Safety Engineering

Any specific areas of the design where alternative solutions are proposed shall be supported by a fire engineering approach in order to meet the Functional Requirements to the Building Regulations 2010.

The use of a fire safety engineering approach is recognised and endorsed within BS 9991 as an acceptable means of complying with the Functional Requirements and in some cases, may be the only practicable way to achieve a satisfactory standard of fire safety.

The methodology for designing a fire safety engineered approach for the designs proposed follows the analytical framework outlined in BS 7974 'The application of fire safety engineering principles to the design of buildings'.

It should be noted that any alternative design solutions proposed within this report are subject to formal approval by the relevant Approval Authorities.

2.4 Statutory Consultation

During the Building Regulations application process, the Building Control Body (BCB) or Approved Inspector (AI) appointed on the scheme is required to formally consult with the local fire authority having jurisdiction.

The purpose of this consultation is to give the Fire Authority an opportunity to review the proposals and make observations with respect to the Building Regulations and to provide an opportunity to make to applicant aware of action that may have to be taken to meet the requirements of the Fire Safety Order.

Responsibility for declaring if the functional requirements of the Building Regulations have been satisfied rests with the BCB or AI appointed on the scheme.

2.5 Regulatory Reform (Fire Safety) Order 2005

Once the building is completed and occupied, the Regulatory Reform Fire Safety Order 2005 (RR(FS)O) becomes the controlling fire safety legislation.

It is necessary, among other things, under this order for the owner/occupier/operator of the building to manage the safety of the areas under their control. Under this legislation a 'Responsible Person or Persons' is required to be appointed in order that the necessary level of safety can be implemented, with an inherent necessity for competence in the area of fire safety.

The fire authority having jurisdiction has the power to inspect the premises to check that the Responsible Person(s) comply with the duties under the Order and will look for evidence that the Responsible Person(s) has carried out a suitable fire risk assessment and acted upon the significant findings of that assessment.

It is important therefore that the Responsible Person takes on board the information provided in this fire strategy when preparing the fire risk assessment reports accordingly to reflect any changes that may need to be made to current fire safety policies and procedures.

3 Means of Escape

3.1 Evacuation Philosophy

The evacuation philosophy for the residential areas shall be defend in place whereby only the occupants in the fire affected flats shall be required to escape. All other occupants shall not receive a signal to evacuate.

The plant and other areas of ancillary accommodation will also operate a completely independent evacuation philosophy from the rest of the building. These areas shall operate a simultaneous evacuation approach whereby upon activation of the detection and alarm system, all areas of these ancillary areas shall receive a signal to evacuate.

3.1.1 Apartments / Flats

As a minimum, all flats should be provided with a Category D LD2 detection and alarm system designed and installed in accordance with BS 5839-1.

Flats provided with a protected entrance hall (30 minutes) from which all habitable rooms are directly accessed have a maximum travel distance within this entrance hall of 9m.

If a sprinkler system and an LD1 detection and alarm system is provided, where the travel distance within the entire flat (from the most remote point to the flat entrance door) is 20m or less, the protection to the entrance hall can be omitted. This is in accordance with BS 9991.

Where an open-plan flat (i.e. the bedrooms shall be inner rooms) arrangement is provided, as per BS 9991 guidance, the following shall be employed:

- A fire alarm and detection system Grade D LD1 should be provided in accordance with BS 5839-6;
- A sprinkler system Category 1 in accordance with BS 9251 or OH1 hazard classification in accordance with BS EN 12845 shall be provided;
- The size of the flats shall not exceed 16 m x 12 m;
- The flats should be located on a single level only;
- Ceiling within the flat should have a minimum height of 2.25 m;
- The kitchen should be enclosed in flats with an area greater than 8m x 4m. Cooking areas in flats smaller than 8m x 4m should not be adjacent to the entrance of the flat.

3.1.2 Communal Corridors and Lobbies

The maximum permitted travel distance within the common corridors is 7.5m, measured from the furthest flat entrance door to the door enclosing the escape stair.

The provision of a sprinkler system in accordance with BS 9251 or BS EN 12845 would permit the maximum travel distance to be extended from 7.5m to 15 m in the ventilated sections of the corridor.

Where the travel distance will be in excess of 7.5m (without sprinklers), or 15m where sprinklers are provided, a mechanical smoke ventilation system (MSVS) will need to be provided as justification. A CFD analysis shall be required to demonstrate acceptable conditions within the corridor.

Sprinklers shall also be required to ensure that the conditions within the corridor remain tenable.

The travel distances and the ventilation provisions of each block is summarised in the fire safety mark-up drawings in section 0 of this report.

3.2 Risk profile

Following the guidance of BS 9999, a risk profile is required to be established to ascertain the appropriate fire safety measures that shall be required for the non-residential areas of the development. The risk profile is a combination of the occupancy characteristic and the fire growth rate of the specific areas.

Based on the above, the appropriate risk profile for the different parts of the development are considered to be:

- Assembly and recreation areas (e.g. leisure centres etc): B2;
- Car park areas: A2;
- Ancillary accommodation area (e.g. energy centre, plant rooms): A3.

3.3 Vertical Means of Escape

Where the block height is greater than 18m, the stairs are required to be designed as fire-fighting stairs and shall therefore have a clear width at least 1,100mm wide. This is in accordance with the recommendations contained in BS 9991. Upon review, all stairs have a minimum width of at least 1100mm.

The stair width should be kept clear for a vertical distance of 2 m.

Service risers or any other facilities are not permitted to be located within or accessed directly from the stairs.

Where the stair is required to be designed as a fire-fighting stair and is not accessed directly from outside, the passageway giving access to the stair is required to have the same fire-resistant enclosure and ventilated lobby protection as the stair it serves in accordance with the figure below:

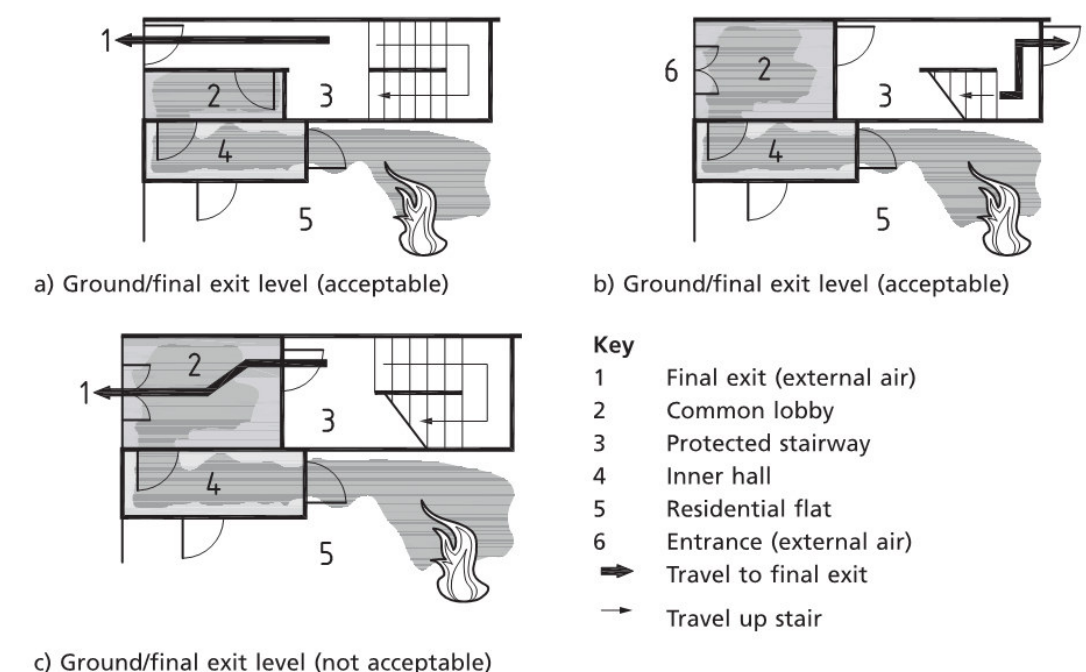


Figure 2: Protection to Final Exit from Stairway

3.3.1 Escape beyond final exits

Travel beyond the building final exits must be away from the building, towards a place of safety, and not be jeopardised by unprotected openings of the building. In general, the building is provided with escape routes, upon exiting the building that are either directly away from the building or alternate paths along the building façade, therefore, fire resisting construction is not be required to maintain means of escape.

4 Active Fire Safety Systems

4.1 Detection and Alarm

The following identifies the location and type of detection and alarm systems required within the development:

Area / Location	Minimum Requirement
Flats with protected entrance halls	Grade D LD2 detection and alarm system designed and installed in accordance with BS 5839-6. See note 1.
Open-plan flats	Grade D LD1 detection and alarm system designed and installed in accordance with BS 5839-6.
Residential common corridors	The residential corridors are required to be provided with an L5 detection and alarm system. This system will operate the ventilation systems in the corridors only. They shall not raise an alarm in the event of a fire. It is recommended that the detector head spacing follows the guidance for an L4 type system as per the recommendations of BS 5839-1.
Areas with a B2 or A2 risk profile	A minimum Category M in accordance with BS 5839-1 is required to be provided. However, a category L3 detection and alarm system in accordance with BS 5839-1 is recommended. The assembly and recreation areaS and car park area shall operate independently from the rest of the buildings.

Note:

- 1) Where travel distance in the protected entrance halls exceeds 9m, an LD1 detection and alarm system may be required as a compensatory measure, depending on the additional travel distance discussions / approval from the relevant BCB or AI appointed on the scheme.

4.2 Smoke Ventilation Systems

4.2.1 Residential Areas

In accordance with BS 9991, the portions of the corridors/lobbies serving the stairs only are required to be provided with a smoke ventilation system. As per BS 9991, the primary purpose of this system is to protect the staircase enclosure. This can be via either one of the following arrangements:

- 1.5m² AOV in an external wall;
- A natural shaft system; or
- A mechanical system.

It should be noted that for buildings over 30m in height only natural smoke shafts and mechanical smoke ventilation systems are suitable.

4.2.2 Natural Smoke Shafts

The natural smoke shaft design shall adhere to the following provisions:

- The smoke shaft should be fully open to the external air at the top and closed at the base;
- The opening at the top of the smoke shaft should be located at least 0.5m above any surrounding structures that fall within a 2m radius on a horizontal plane so that it is not subject to adverse wind effects (i.e. it should always have negative wind pressure coefficients);
- The cross-sectional area (free area) of the smoke shaft should be at least 1.5m², with a minimum dimension of 0.85m in any direction;
- The AOVs opening into the smoke shaft from the corridors will have a free area of at least 1.0 m²;
- The opening at the head of the shaft and all internal locations (such as safety grilles) within the shaft will have a free area of at least 1.0 m²;
- The top of the lobby or corridor vent should be located as close to the ceiling of the lobby or corridor as is practicable and should be at least as high as the top of the door connecting the lobby or corridor to the stairwell;
- The corridor vents opening into the smoke shaft should, in the closed position, have a minimum fire and smoke resistance performance of 30 min and integrity (leakage) no greater than 360 m³/h/m² when tested in accordance with BS EN 1366-2;
- The smoke shaft should be constructed either of non-combustible materials conforming to BS 476-4 or of any material which, when tested in accordance with BS 476-11, does not flame or cause any rise in the temperature on either the centre of the specimen or the furnace thermocouples. The smoke shaft should run vertically from top to bottom with no more than 4m of the shaft at an inclined angle (max 30°);
- No services other than those relating to the smoke shaft should be contained within the smoke shaft;
- In accordance with BS 9991, the shaft should extend a minimum length of 2.5 m above the ceiling of the highest storey which is served by the shaft. However, as an alternative, the AOV opening into the smoke shaft on the top floor level and the AOV located at the head of the smoke shaft shall have a free area of not less than 1.5m² (an increase from the recommended 1.0m²). Please see the indicative Figure 3 below:

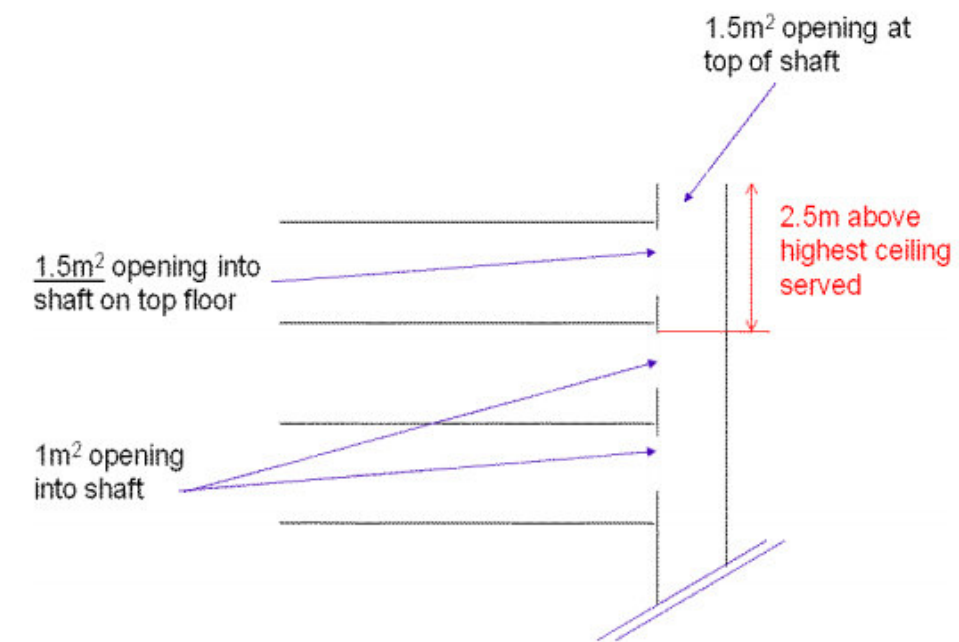


Figure 3 – Top of smoke shaft detail

This approach reflects the acceptable alternative arrangements as highlighted within the Building Control Alliance (BCA) guidance note 8 – Smoke Shaft termination at roof level.

4.2.3 Mechanical Smoke Ventilation Systems

Where provided, mechanical smoke shafts are subject to bespoke design development and shall require CFD modelling to demonstrate the system is suitable for application.

In general, mechanical smoke ventilation systems serving communal corridors should adhere to the following recommendations:

- The top of the lobby or corridor vent should be located as close to the ceiling of the lobby or corridor as is practicable and should be at least as high as the top of the door connecting the lobby or corridor to the stairwell;
- The corridor vents opening into the smoke shaft should, in the closed position, have a minimum fire and smoke resistance performance of 30 min and integrity (leakage) no greater than 360 m³/h/m² when tested in accordance with BS EN 1366-2;
- No services other than those relating to the smoke shaft should be contained within the smoke shaft;
- The smoke shafts will be located at the remote end of the corridor away from the staircase;
- The MSVS design should ensure the pressure differentials are such that the door opening forces are not in exceedance of 100 N when the system is in operation;
- Fan sets should usually be provided with a standby fan that operates automatically upon failure of the duty fan;
- The required extract rate for the MSVS will need to be determined through an assessment of any specific risks within the building and shall need to be verified through a CFD analysis. Guidance in relation to tenability criteria and recommended fire sizes is given in the Smoke Control Association (SCA) document “Guidance on smoke control to common escape routes in apartment buildings (flats and maisonettes)”.

4.2.4 Car Park

All car parks are required to have a smoke ventilation system. It is recommended the car park is provided with a natural ventilation system equivalent to 5% of the floor area of the car park. 2.5% is required to be split equally (1.25%) on opposing walls. This is sufficient for meeting Part B and Part F requirements.

Alternatively, the car park can be provided with a natural ventilation system equivalent to 2.5% of the floor area of the car park. 12.5% is required to be split equally (0.625%) on opposing walls. This is sufficient for meeting Part B requirements only.

If the natural ventilation parameters above cannot be achieved, a mechanical ventilation system shall be required. The system should be designed and installed in accordance with BS 7346-7. CFD modelling will be required to demonstrate the performance of the proposed system.

4.2.5 Other Ventilation Requirements

Storage and other ancillary areas approached from common escape routes shall need to be provided with a ventilated lobby having not less than 0.4m² of permanent ventilation.

The car park is to be separated from the residential cores with a double-lobby arrangement. The lobby nearest the car park is required to have an 0.4m² permanently open vent.

4.3 Automatic Suppression Systems

In accordance with BS 9991, buildings that have a floor located 30m above ground level are required to be provided with a sprinkler system throughout the building. The sprinkler system shall conform to the recommendations in BS 9251 for the residential areas and BS EN 12845 for any commercial areas that connect to the building.

Notwithstanding the information above, all blocks with a floor height more than 18m above ground level shall be provided with a sprinkler system designed and installed in accordance with BS 9251 within the flats only as per Countryside's standard practice.

4.4 Emergency Lighting & Exit Signage

Emergency Lighting is to be provided in accordance with BS 5266-1 and should be provided in the following areas as a minimum:

- All stairwells;
- All underground or windowless accommodations;
- Open plan areas with a floor area exceeding 60m²;
- All accommodation in public areas;
- All sanitary accommodation with a floor area greater than 8.0m²;
- Electricity and generator rooms;
- Switch room/battery room for emergency lighting system;

All escape routes are to be distinctively and conspicuously marked by emergency exit signs following the recommendations of BS ISO 3864 Part 1: 2011 and BS 5499 Part 4: 2013. Escape route signage should be provided to include directions outside the building to the nominated assembly point.

4.5 Secondary Power Supplies

A secondary power supply shall be provided for essential equipment for firefighting and emergency escape systems (i.e. emergency lighting / fire alarm and Smoke ventilation systems).

5 Passive Fire Safety Measures

The required fire resistance for the buildings and walls separating buildings depends upon the height of the building. The tables below identify the requirements for the passive fire protection ratings for buildings based on their height:

Table 2: Periods of Fire Resistance – Buildings with a top floor less than 18m above ground

	Minimum Periods of Fire Resistance (minutes)
Structural Fire Resistance	60
Compartment Floors	60
Compartment walls (separating flats from all other areas)	60
Compartment walls (separating all other areas)	60
Compartment walls (enclosing ancillary areas)	Areas of ancillary accommodation are required to achieve the recommended fire resistance given in Table 29 of BS 9999 as referenced in BS 9991
Enclosing Fire-fighting shaft	Not Applicable
Enclosing Service Risers	60
Enclosing a flat / apartment entrance hall	30

Table 3: Periods of Fire Resistance – Buildings with a top floor less than 30m above ground

	Minimum Periods of Fire Resistance (minutes)
Structural Fire Resistance	90
Compartment Floors	90
Compartment walls (separating flats from all other areas)	60
Compartment walls (separating all other areas)	90
Compartment walls (enclosing ancillary areas)	Areas of ancillary accommodation are required to achieve the recommended fire resistance given in Table 29 of BS 9999 as referenced in BS 9991
Enclosing Fire-fighting shaft	120
Enclosing Service Risers	90
Enclosing a flat / apartment entrance hall	30

All floors are required to be designed as compartment floors.

A dry-rising main is required to be provided within the escape stair. These are to be designed and installed in accordance with BS 9990. The maximum horizontal run permitted for a dry rising main is 18m in accordance with BS 9990.

Cavity barriers are required to be provided in accordance with the recommendations in BS 9991. Cavity barriers are required to have a minimum of 30 minutes integrity and 15 minutes insulation.

Where services penetrate compartmentation in the following fire strategy drawings these shall be appropriately fire stopped or fitted with fire and/or smoke dampers.

5.1 Ancillary Accommodation

Ancillary accommodation within the buildings is to be enclosed within fire-resisting construction in accordance with Table 15 of BS 9991. The degree of separation required depends on the contents of the room / enclosure, as summarized in the table below:

Table 4 – Summary of ancillary areas minimum fire protection requirements

Ancillary Accommodation	Minimum Fire Resistance
Storage areas not greater than 450m ²	30 Minutes
Kitchens	
Transformer, switchgear and batter rooms for LV equipment	
Dressing or changing rooms	
Storage areas greater than 450m ² in area.	60 Minutes
Service installation rooms	
Places classified as high fire risk areas	
Repair and maintenance workshops where flammable liquids are used / stored	
Covered car parks within or adjoining the building and not greater than 450m ² in area	
Transformer and switchgear rooms for equipment above low voltage	60 minutes (building height ≤ 18m) 90 minutes (building height ≤ 30m)
Refuse storage areas	
Boiler rooms	
Fuel storage spaces	
Rooms housing fixed internal combustion engine(s)	
Covered car parks within or adjoining the building and greater than 450m ² in area	
Any area that contains plant associated with life safety systems and fire protection systems	120 Minutes

6 External Fire Spread

6.1 External Wall Construction

External walls should be constructed such that they will not support fire spread at a speed that is likely to threaten people in or around the building.

External wall surfaces near other buildings should not be readily ignitable, to avoid fire spread between buildings.

For all types of buildings, the external walls should meet all the following recommendations, unless where otherwise required under regulation 7(2) and 6.1.1 below:

- The external surfaces of walls should meet the provisions in Figure 17 of BS 9991 (the relevant part has been reproduced in the section 6.2 below);
- In a building with a storey 18 m or more above ground level, any insulation product, filler material (not including gaskets, sealants and similar), etc. used in the external wall construction should be limited combustibility. This restriction does not apply to masonry cavity wall construction.
- Cavity barriers should be provided in accordance with section 19.1 of BS 9999;

6.1.1 Regulation 7(2)

In accordance with Regulation 7 (2), all building work shall be carried out so that materials which become part of an external wall, or specified attachment, of a relevant building are of European Classification A2-s1, d0 or A1, classified in accordance with BS EN 13501-1:2007+A1:2009 entitled “Fire classification of construction products and building elements. Classification using test data from reaction to fire tests” (ISBN 978 0 580 59861 6) published by the British Standards Institution on 30th March 2007 and amended in November 2009.

The information in the paragraph above does not apply to:

- cavity trays when used between two leaves of masonry;
- any part of a roof (other than any part of a roof which falls within paragraph (iv) of regulation 2(6)) if that part is connected to an external wall;
- door frames and doors;
- electrical installations;
- insulation and water proofing materials used below ground level;
- intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1;
- membranes;
- seals, gaskets, fixings, sealants and backer rods;
- thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1; or
- window frames and glass.

Note: a relevant building is a building with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level and which—

- contains one or more dwellings;

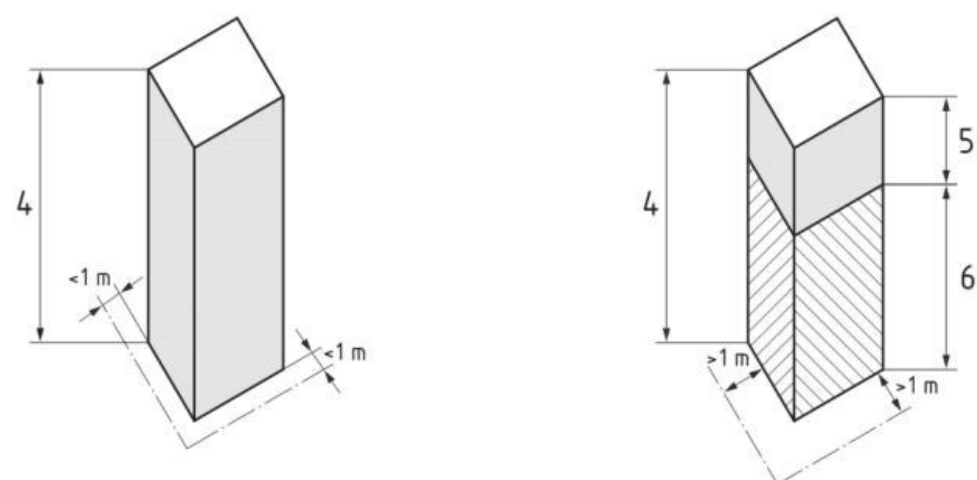
- contains an institution; or
- contains a room for residential purposes (excluding any room in a hostel, hotel or boarding house)

6.2 External Surface Spread of Flame

The external wall surface requirements depend on the height of the building and the distance to the boundary.

This development has a building height over 18 m and therefore the following provisions of external wall surfaces apply:

Note: Whilst the below external wall classifications are applicable to buildings over 18m, the information in section 6.1.1 takes precedence on the performance criteria for external walls in relevant buildings above 18m.



d) Any building

e) Any building

Key

- 4 Building with a storey height 18 m or more above ground level
- 5 Portion of building with a storey height 18 m or more above ground level
- 6 Portion of building with a storey height <18 m above ground level
- Relevant boundary
- No provision in respect of the boundaries indicated
- Class 0 (national class) or Class B-S3, d2 or better (European class). Profiled or flat steel sheet at least 0.5 mm thick with an organic coating of no more than 0.2 mm thickness is also acceptable.
- Index (I) not more than 20 (national class) or Class C-s3, d2 or better (European class). Timber cladding at least 9 mm thick is also acceptable. (The index I relates to tests specified in BS 476-6.)

Figure 4 – External Wall Surfaces – All Blocks

The external wall surfaces are subjected to the provisions detailed in section 6.1.

6.3 Space separation

A detailed external fire spread analysis in accordance with BR 187 shall be carried out at the next design stage to ascertain the permitted amount of unprotected area.

7 Fire Service Access and Facilities

7.1.1 Vehicle Access

All blocks of flats shall be provided with dry rising mains designed and installed in accordance with BS 9990.

vehicle access for the Fire Service is required to be within 18m of the dry riser inlet positions.

The maximum reversing distance for the fire service vehicles should not exceed 20m. Hammer-heads / turning circles should be provided where appropriate to ensure this maximum distance is adhered to.

When designing access roads that can be used by the Fire Service, the following dimensions should be adhered to:

Table 5: Examples of minimum measurements for a typical vehicle access route

Type of appliance	Road width (between kerbs)	Width of gates	Min. turning circle (between kerbs)	Turning circle (between walls)	Height Clearance	Carrying capacity
Pump	3.7	3.1	16.8	19.2	3.7	12.5

Note:

- 1) Fire Service access vehicles are not standardised and a check should be made with the local fire services to obtain the relevant dimensions.

7.2 Access into and through the building

Access into the buildings will be provided through the main entrance to the buildings.

Where the block height is greater than 18m, the stairs are required to be designed as fire-fighting stairs in accordance with the recommendations contained in BS 9991.

Blocks that have a floor level located 18m above ground are required to have a firefighting shaft.

The contents of a fire fighting shaft include:

- A fire-fighting stair;
- A fire-fighting lift;
- A dry rising main.

Where fire-fighting shafts are required they should be located such that the following recommendations are met:

- If the building is fitted throughout with a sprinkler system in accordance with BS 9251:2014 or BS EN 12845, then fire-fighting shafts should be provided such that that every part of every storey is no more than 60 m from a fire main outlet in a fire-fighting shaft, as measured on a route suitable for laying hose.
- If the building is not fitted with sprinklers, then every part of every storey should be no more than 45 m from a fire main outlet contained in a protected stairway and 60 m from a fire main in a fire-fighting shaft, as measured on a route suitable for laying hose.

The dry-rising main is required to be designed and installed in accordance with BS 9990. Vehicle access is required to be provided to within 18m and in sight of the dry rising main inlet position. The maximum horizontal run permitted for a dry rising main is 18m in accordance with BS 9990.

All doors giving access to the interior of the building will have a minimum width of 850 mm.

Where the fire-fighting stair are not accessed directly from outside, the passageway giving access to the stair should have the same fire-resistance enclosure and ventilated lobby protection as the stair it serves. The passageway should not exceed 18 m in length.

To facilitate fire-fighting, it would also be recommended that a premises information box is provided.

Liaison should be conducted with the FRS in order to ascertain security arrangements to facilitate access into the protected stair in the event of an emergency as part of management duties under the FSO.

7.3 Water supplies

Dry riser outlets shall be provided at each floor level within the fire-fighting stairs in accordance with BS 9999.

Hydrants will be required in the vicinity of the building to support fire-fighting operations.

If the building is more than 100 m from an existing hydrant, hydrants should be provided within 90m of an entry point to the building and not more than 90m apart.

If 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 they 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 on the continuing viability of the location and should be not less than 6m from the building or other risk.

A water supply capable of providing a minimum 1,500 litres per minute at all times is recommended. Water supplies will be designed and installed in accordance with BS 9990.

7.4 Fire-aid firefighting

First-aid firefighting provisions should be assessed and provided as part of the fire risk assessment for the building, including consideration for the day-to-day management of the provisions.

In general, fire points should be located at all storey exits, within specific areas presenting a significant fire risk and to ensure coverage of at least one fire point for every 200 m² of floor area. The type and size of extinguisher(s) at each fire point should be chosen in accordance with the guidance given in BS 5306.