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| | <ul style="list-style-type: none">• Switch room/battery room for emergency lighting.• Windowless accommodation within live-work units |
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4. B2 - Internal Fire Spread (Linings)

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B2, Internal Fire Spread (Linings):

- (1) To inhibit the spread of fire within the building the internal linings shall-*
- (a) Adequately resist the spread of flame over their surfaces; and*
 - (b) Have, if ignited, a rate of heat release which is reasonable in the circumstances.*
- (2) In this paragraph 'internal linings' means the materials lining any partition, wall, ceiling or other internal structure.*

Internal linings will be required to meet the following criteria as laid out in BS 9991:

- Circulation spaces within dwellings – Class C-s3, d2 in accordance with BS EN 13501-1.
- Other circulation spaces (including the common parts) – Class B-s3, d2 in accordance with BS EN 13501-1.
- Other circulation spaces (including small rooms of area not more than 4m² in residential buildings and 30m² in a non-residential building) – Class D-s3, d2 in accordance with BS EN 13501-1.

It is presumed that the apartments and communal areas will be provided with a plaster/plasterboard finish, which is deemed satisfactory.

Note: Wallcoverings which conform to BS EN 15302, achieving at least class C-s3, d2 and bonded to a class A2-s3, d2 substrate will be acceptable.

Surface spread of flame requirements within firefighting stairs (where applicable) should be A2-s2, d2 or better.

5. B3 - Internal Fire Spread (Structure)

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B3, Internal Fire Spread (Structure):

- (1) The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period.*
- (2) A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those two buildings.*
- (3) To inhibit the spread of fire within the building, it shall be sub-divided with fire resisting construction to an extent appropriate to the size and intended use of the building.*
- (4) The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.*

5.1 Loadbearing Elements of Structure

Fire resistance periods for elements of structure should provide a minimum of 60 minutes.

Elements of structure are deemed to be any part of a structural frame, loadbearing wall or floor and a compartment wall.

5.2 Compartmentation

To facilitate the stay-put strategy, all flats are required to form their own compartments rated to a minimum of 60 minutes fire resistance.

Due to the sleeping risk, 60-minute compartment floors are required, achieving the same fire resistance as per the elements of structure.

All floors in the building will be required to form compartment floors and therefore all penetrations (including stairs, lift and service risers) are required to be arranged as protected shafts and any penetrations through appropriately fire stopped, with the lift, stair and service riser doors having half the rating of the wall.

Where stairs discharge through a lobby on the ground floor, this is defined as part of the shaft and therefore is to achieve the same level of fire resistance (60 minute).

60 minute compartmentation is to be maintained between the community centre and the residential areas of the building.

5.3 Ancillary Accommodation

Ancillary accommodation should be enclosed with fire resisting construction as recommended in Table 15 of BS 9991 provides the following fire resistance criteria.

Table 5: Ancillary accommodation structural fire resistance

Ancillary Accommodation	Structural fire protection
1) Transformer, switchgear and battery rooms for low voltage equipment.	Robust Construction having a minimum standard of fire resistance of 30-minutes.
2) Refuse and cycle storage areas.	Robust construction having a minimum standard of fire resistance of 60-minutes.
3) Engineering services installation rooms	
4) Boiler rooms and fuel storage	
5) Transformer and switchgear rooms for equipment above low voltage	

Note: *Any openings in the required construction should be protected by doors having a similar standard of fire resistance and be capable of resisting the passage of smoke at ambient temperatures, for example where doors open onto the common corridor, this presents a risk.

5.4 Fire Doors

It is a requirement that the manufacturers are to have their fire doors assessed by subjecting them to a test procedure as specified in BS476 Part 22:1987 or BS EN 1634 Part 1:2014. Tests are made on complete door assemblies: i.e. the fire door and doorframe with all the requisite hardware (e.g. locks, latches, hinges, etc). The assembly, or door set, as it is also known, is fixed in a wall representing its use in practice.

It is acceptable to provide doors on electromagnetic door hold open devices which release on the operation of the fire alarm and detection system and power failure.

Due to the anticipated occupancy numbers exceeding 60 people due to terrace occupancy, lobby doors opening into the stair shaft and the final exits should have door opening in the direction of escape.

All doors necessary for escape which are provided with access controls will be provided with a suitable override facility that is acceptable to the approving authorities. Any electronic locks or hold open devices on escape doors will be failsafe, have break glass and manual release button and be linked to the fire alarm to BS 7273-4:2015. Fire doors will be provided in the building as follows:

Table 6: Door rating.

Door location	Fire wall resistance	Door rating (minutes)
Protected stair shaft (with self-closing device)	60 minutes	FD30S
Lift shaft	60 minutes	FD30
Service shafts	60 minutes	FD30
Flat entrance doors (with self-closing device)	60 minutes	FD30S
Balcony flat entrance doors (with self-closing device)	60 minutes	FD30
Protected hall within a flat	n/a	n/a
Plant rooms (with self-closing device)	60 minutes	FD60S

Note: *Any openings in the required construction should be protected by doors having a similar standard of fire resistance and be capable of resisting the passage of smoke at ambient temperatures, for example where doors open onto the common corridor, this presents a risk.

Doors forming part of the means of escape from or within the building should:

- Be fitted only with simple fastenings that can be operated from the escape side of the door without the use of a key.
- Be hung clear of any change of floor level.
- Be hung so that they do not reduce the effective width of any escape route across a landing.
- If opening into a corridor, be recessed to the full width of the door.
- Where hung to swing both ways (double swing), or subdividing corridors, be provided with a minimum of a vision panel.
- Open to an angle not less than 90°.

All fire doors should be marked with one of the following fire safety signs, complying with BS5499-5 as appropriate:

- To be Kept closed when not in use – mark 'Fire door keep shut';
- To be kept locked shut when not in use – mark 'Fire door keep locked shut';
- Held open by an automatic release mechanism or free swing device – mark 'Automatic fire door keep clear'.

All fire door-sets should be marked on both sides, except fire door-sets to cupboards and service ducts, which should be marked on the outside.

5.5 Sprinkler Protection

Residential blocks with a top storey greater than 11m should be fitted with a sprinkler system throughout the building. The M&E specialist should consider the following system:

Due to non-fire sterile communal parts a Category 3 system should be considered.

Where a higher fire safety risk applies to a sprinkler system specification, the minimum design discharge density is to be increased to 4mm/min for single head operation, or 2.8mm/minute through each sprinkler operating simultaneously up to four sprinklers in a single area of operation, for a duration of 30-minutes. Where communal corridors are managed areas and considered to be sterile, the number of design sprinklers can be limited to two in these areas only.

Bin stores, plant rooms and bike storage, require a minimum density of 5 mm/minute that should be applied, utilising BS EN 12259-1 sprinkler heads, with quick response heads conforming to BS EN 12259-1.

This criterion is not exhausted and a competent person would be responsible for the design and commissioning of the sprinkler system.

Extent of sprinkler protection:

Sprinkler protection should be provided in all parts of the premises; however, sprinklers may be omitted to the following areas:

- a) Bathrooms and showers with a floor area less than 5m², with linings conforming to Class A1, A2-s3, d2 and B-s3, d2, which are not prepared for the use of white-goods (i.e. washing machines, dryers, electric showers or water heaters).
- b) Enclosed staircases containing only materials of Class B-s3 or better for construction materials, and B(fl) or better for flooring.
- c) Ceiling voids.
- d) Enclosed vertical shafts (e.g. lifts or service shafts) containing only materials conforming to B-s3 or better for construction materials, and B(fl) or better for flooring.
- e) Cupboards and pantries with a floor area less than 2m² or where the least dimension does not exceed 1m and the room is not prepared for consumer units or electrical equipment (excluding a single light).
- f) Uninhabited loft/roof void.
- g) Water closet (WC) with a floor area less than 5m², with lining conforming to Class A1, A2-s3, d2 and B-s3, d2 and are not prepared for white goods as describe in (a) above.
- h) Attached buildings, such as garages and plant rooms without direct access from within the protected building.
- i) Crawl spaces.
- j) External balconies permanently open to the outside.

The community centre and Library will require sprinkler protection in accordance with BS EN 12845, achieving OH1 classification.

5.6 Protection of Openings and Firestopping

Any ductwork passing through compartment/fire resistant walls will maintain integrity of those elements by either:

- Be contained within fire resisting construction.
- Containment by using fire resistant ductwork.
- Protection by installing fire dampers.

Ventilation ducts supplying or extracting air directly to or from a protected stairway should not serve any other areas. Ductwork serving other areas and passing through a stair enclosure should be protected by fire and smoke rated dampers linked to the fire alarm or separated by a fire-resistant enclosure.

Ductwork serving both escape routes and accommodation will be provided with fire and smoke dampers (ES Rated) that are activated automatically on the activation of the building fire alarm and detection system. Dampers to be fully in accordance with BS 9999: 2017.

Ductwork passing through fire rated walls separating fire compartments could be provided with fusible link fire dampers in accordance with BS 9991 Section 21.2 and BS 9999 Section 32.5.

All dampers are to be mechanically fixed to elements of structure, so they are self-supporting and positioned in the fire line in accordance with the manufacturer's installation guidelines.

Any openings for pipes with a restricted diameter (as given in Table 7) breaching compartment walls are required to be fire stopped (unless protected along its entire length with fire resisting material), keeping the opening as small as possible, in accordance with BS 9991. All other pipes (of any diameter) should be provided with a proprietary seal, tested in accordance with BS EN 1366-3:2015.

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

Situation	Maximum nominal internal diameter (mm)		
	a) High melting point metal ⁽¹⁾	b) Lead, aluminium, aluminium alloy, uPVC ⁽²⁾ , fibre-cement.	c) Any other material
1. <i>Structure (but not a wall separating buildings) enclosing a protected shaft which is not a stairway</i>	160	110	40
2. <i>Compartment wall or compartment floor between flats</i>	160	160 (stack pipe) ⁽³⁾ 110 (branch pipe) ⁽³⁾	40
3. <i>Any other situation</i>	160	40	40

NOTES:

1. Any metal (such as cast iron, copper or steel) which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.
2. uPVC pipes that comply with either BS 4514 or BS 5255.
3. These diameters are only in relation to pipes that form part of an above-ground drainage system and are enclosed as shown in BS 9991 Figure 29. In other cases, the maximum diameters given for situation 3 apply.

5.7 Provisions for Cavities

The cavity barriers will provide a 30-minute fire rating (i.e. 30 minutes integrity and 15 minutes insulation). Any penetrations through the cavity barriers will be either:

- Fitted with a proprietary sealing system.
- Pipes of limited diameters that are sealed with fire-stopping or sealed with sleeving of non-combustible pipe material.
- Dampers are required to ductwork.

In addition to the above locations, cavity barriers are also proposed in any ceiling voids and under floor service voids where the cavity exceeds 20m (i.e. at 20m centres).

Figure 24 from BS 9991 is reproduced below for ease of reference.

Figure 24 Provisions for cavity barriers

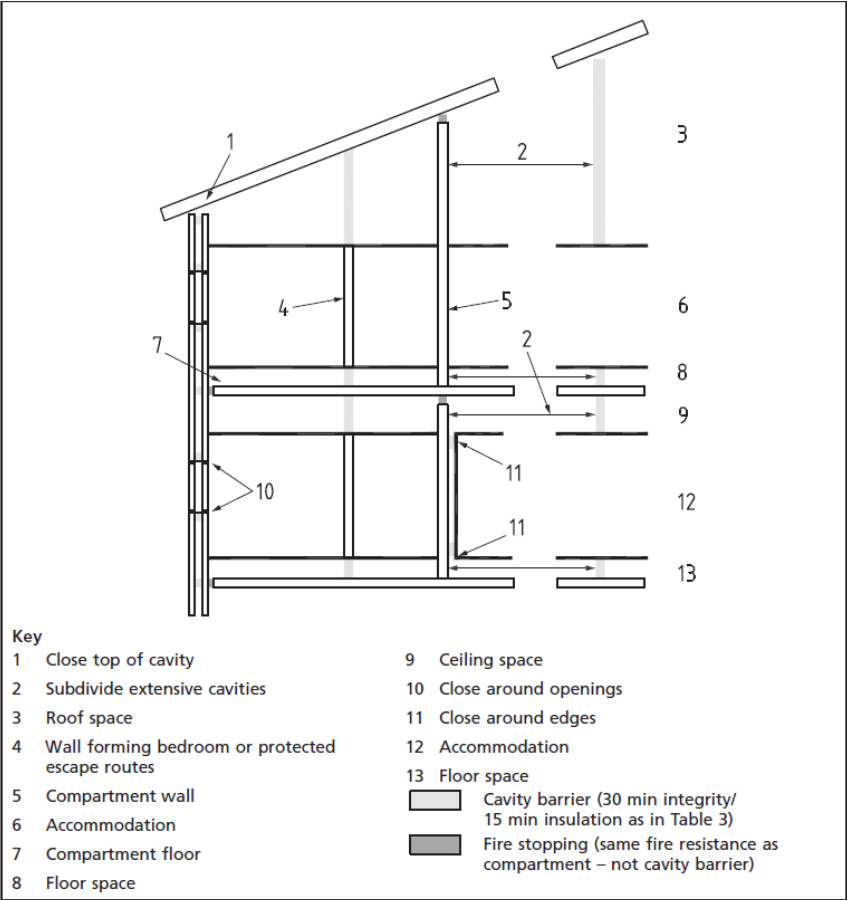


Figure 10: Cavity Barrier Provisions

5.8 Provision of external wall cavity barriers.

A cavity in an external wall can behave as a chimney, accelerating fire spread up a façade. This can be a threat to occupants or firefighters if the cavity is open to the exterior. Sealed cavities are generally not a problem.

Where wall construction provides two leaves of brick or concrete, each with a thickness of least 75mm, the provision to provide cavity barriers at compartment walls and floors can be omitted, we have reproduced Diagram 8.2 from Approved Document B as this diagram best illustrates the provision:

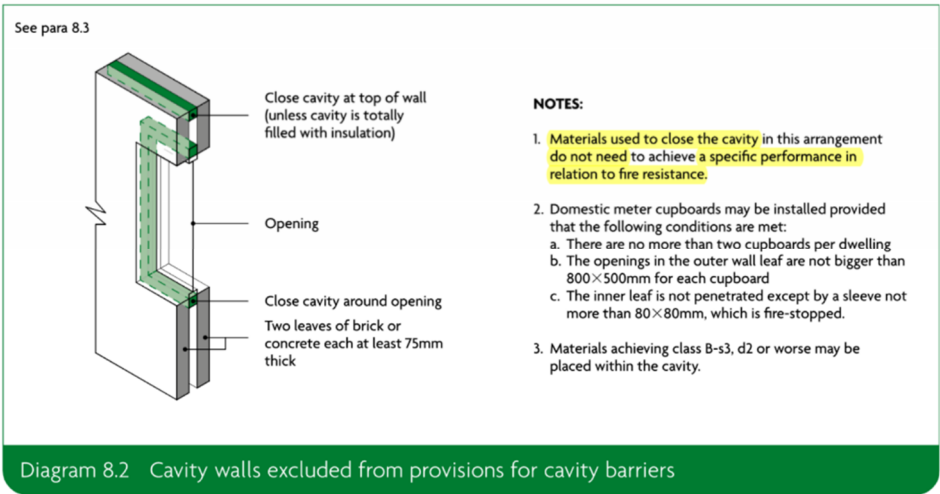


Diagram 8.2 Cavity walls excluded from provisions for cavity barriers

Figure 11: Cavity wall construction excluded from cavity barrier provision.

6. B4 - External Fire Spread

Schedule 1 of the Building Regulations 2010 (as amended) provides the following functional requirement in relation to B4, External Fire Spread:

- (1) The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of building.
- (2) The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.

6.1 Overview

New buildings are required to be assessed for external fire spread. This is assessed in three ways; to ensure there is adequate separation to relevant boundaries to prevent fire spread, to also ensure that the external surfaces do not present a means for rapid fire spread and to ensure that the contents of the external walls do not provide a medium for rapid fire spread.

6.2 Space Separation

External fire spread calculations have been undertaken using the enclosing rectangle approach as detailed in BR 187 External fire spread – Building separation and boundary distances. Due to the provision of compartment walls and floors we are able to assess individual compartments in relation to known boundaries, this will assist with reducing the perceived radiance from a given elevation.

The external wall construction will achieve 60 minutes fire resistance, therefore only the unprotected openings would be limited to windows and doors in the external walls.

The relevant boundary should usually be taken as the site boundary. Where a wall faces onto a space that is unlikely to be developed, such as a road, train lines, canal or river, then the boundary may be assumed to be an imaginary line halfway across this feature. Where different blocks face each other, a notional boundary is taken as the midpoint between both buildings.



Figure 12: Building Façade in relation to known & notional boundaries.

The West elevation is shown below, to illustrate how we assess the largest compartment with the most unprotected openings to justify suitable separation between buildings.

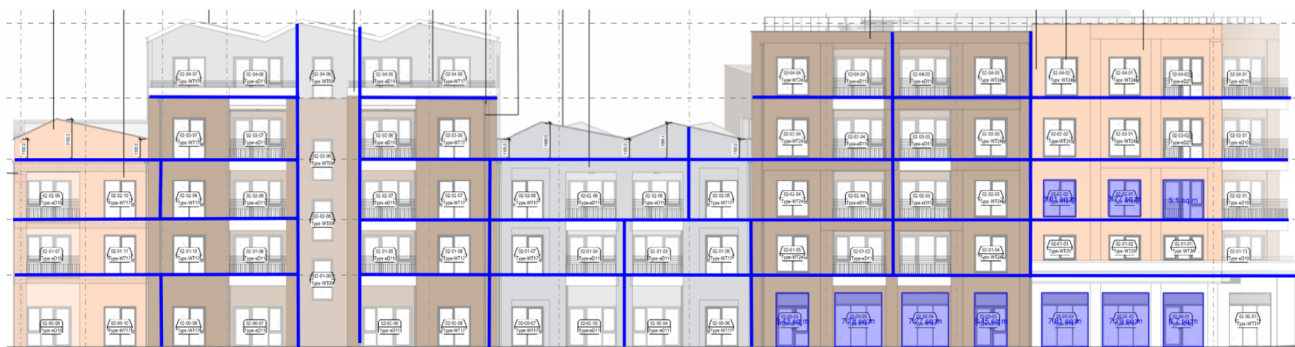


Figure 13: West elevation, compartment walls and floors illustrated.

The largest compartment with the most unprotected openings is used to check the worst-case scenario in relation to the nearest boundary:

Table 8: External Fire Spread Calculations

<i>Block A</i>	<i>Size of Compartment (W x H)</i>	<i>BRE Enclosing Rectangle (W x H)</i>	<i>Unprotected Area (windows and doors)</i>	<i>Boundary Distance Provided</i>	<i>Distance to boundary required</i>	<i>Satisfactory (Yes / No)</i>
<i>North elevation</i>	4.4 m x 2.3 m	6 m x 3 m (18 m ²)	8.20 m ²	18.50 m	1.5 m (45 %)	Yes
<i>East elevation</i>	4.9 m x 2.2 m	6 m x 3 m (18 m ²)	7.76 m ²	4.32 m	1.5 m (43 %)	Yes
<i>South elevation</i>	19.4 m x 3.2 m	21 m x 6m (126 m ²)	44.30 m ²	5.61 m	3.5 m (35 %)	Yes
<i>West elevation (commercial)</i>	24.0 m x 3.0 m	24 m x 3m (72 m ²)	48.80 m ²	3.32 m	3.0 m (68 %)	Yes

*Assumed notional boundary between buildings.

Note: It is assumed only the doors and windows are non-fire rated with the brickwork façade achieving 60 minutes fire resistance.

6.3 Internal angle on an external wall between dwellings

In buildings of any height, the possibility of a fire spreading from one compartment to another externally across a gap created by an internal angle between the facades should be minimized. Where the external wall of a dwelling projects beyond, is recessed from, or forms an internal angle not exceeding 135° with the external wall to another dwelling, then the distance between any openings in these external walls should be not less than 1.0m

Internal openings are noted as being within 1.0m of each other at second and third levels in Block A; this is also evident at first, second and third floor levels in Block B. Therefore, as agreed with Building Control, all bathrooms are encapsulated with 30-minute fire resisting construction and provided with a FD30 doors.

6.4 Surface Spread of Flame Requirements

The proposed development has a storey not exceeding 18m above ground and therefore are not classed as 'Relevant building' under Regulation 7(4).

The external envelope should not contribute to undue spread of fire and as the building is under 18m in height and greater than 1m from a known relevant boundary, there are no provisions in relation to external surface of walls when assessed under BS9991: 2015. However, the latest 2022 edition of Approved Document B, requires residential buildings, with a top floor height greater than 11m and more than 1m from a relevant boundary to achieve Class A2-s1, d0 or better, as this is a newer requirement.

It is understood that the balconies will be of steel construction with stainless steel balustrades and banisters, with decking achieving Class A1 or A2-s1, d0, in accordance with BS EN 13501-1 2018.

6.5 Roofs

New roof to achieve Class B_{ROOF}(t4) covering as they are within 6m of a relevant boundary.

7. B5 - Access and Facilities for the Fire Service

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B5, Access and Facilities for the Fire Service:

- (1) The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life.
- (2) Reasonable provisions shall be made within the site of the building to enable fire appliances to gain access to the building.

7.1 Access to the Building for Firefighting.

The building will be accessed via public and onsite roadways which need to be suitable to withstand a fire tender in the event of a fire. The following parameters will be achieved.

Table 9: Pump appliance access route requirements.

Appliance Type	Min. width of road between kerbs	Min. width of gateways	Min. turning circle between kerbs	Min. turning circle between walls	Min. clearance height	Min. carrying capacity
Pump	3.7m	3.1m	16.8m	19.2m	3.7m	12.5t*
High Reach	3.7m	3.1m	26.0m	29.0m	4.0m	17.0t*

Note: * The minimum carrying capacity should be checked with the local fire brigade.

Turning facilities should be provided in any vehicular dead-end access route that is more than 20m long. This can be by a hammer-head or turning circle.

Any gates that the fire and rescue service vehicle must pass are required to be provided with a fire brigade lock only (no other padlocks or locking devices are permitted).

As illustrated below, the building has compliant fire brigade access as the tender location is within 18m of the dry riser inlets. Subject to the above road provisions being achieve, fire brigade access provisions appear satisfactory.

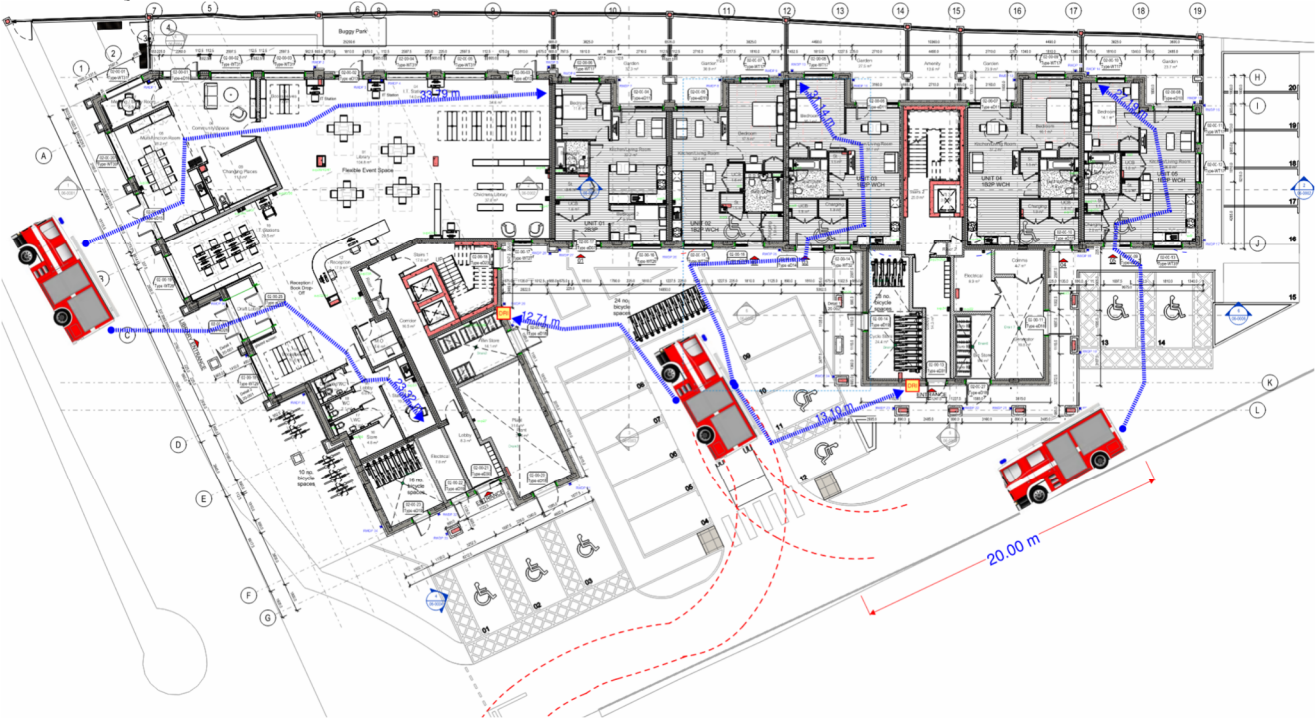


Figure 14: Fire tender access

7.1.1 Building fitted with fire mains (Dry risers)

The dry riser inlet positions should be visible from the parked fire tender location, with dry riser outlet positioned at each landing designed and installed in accordance with BS 9990.

Fire mains (dry riser) are provided to each stair core with outlets located at each level within the stair shaft, the hose should reach the furthest corner in each flat within 45m of the dry riser outlet as measured along the firefighting route.

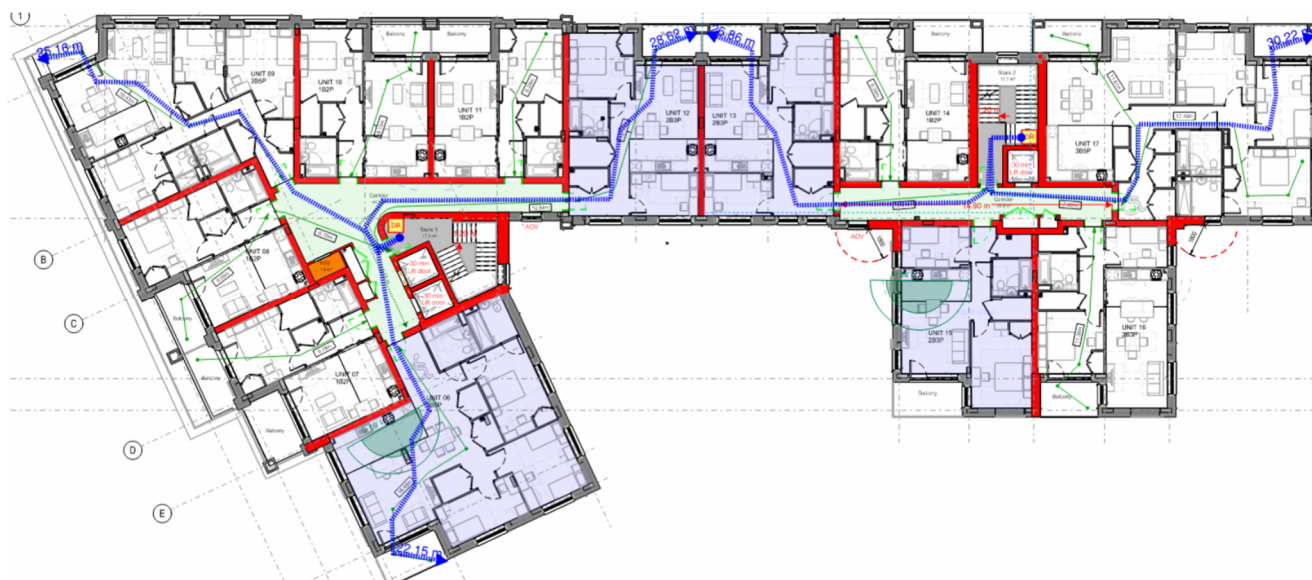


Figure 15: First floor compliant 45m hose coverage.

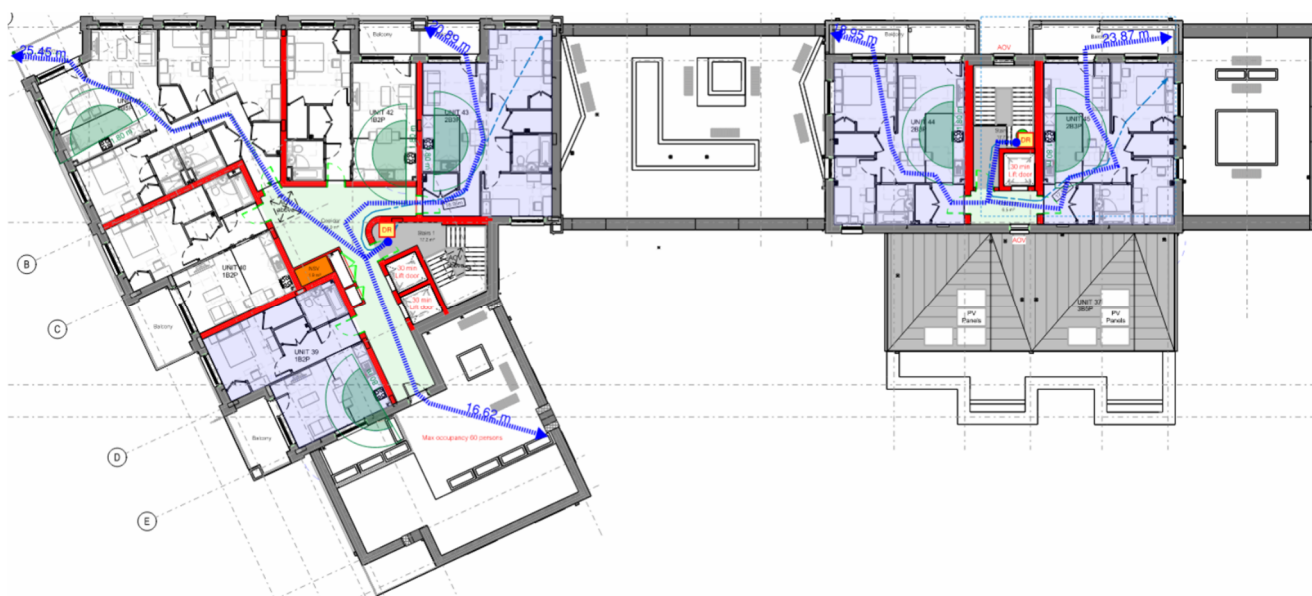


Figure 16: Four floor level (top floor) compliant 45m hose coverage.

Firefighting access is considered to satisfy the functional requirements of Part B of the Building Regulations 2010 (as amended).

7.2 Firefighting Shaft

For a building with an occupied floor level not exceeding 18m in height, there is no requirement for a firefighting shaft.

7.3 Wayfinding signage for the fire service

To assist the fire service to identify each floor in a building of apartments with a top storey more than 11m above ground level, floor identification signs and apartment indicator signs are to be provided, to assist the fire authority and general users of the building.

The floor identification signs should meet all of the following conditions.

- a. The signs should be located on every landing of a protected stairway and every protected corridor/lobby (or open access balcony) into which a firefighting lift opens.
- b. The text should be in sans serif typeface with a letter height of at least 50mm. The height of the numeral that designates the floor number should be at least 75mm.
- c. The signs should be visible from the top step of a firefighting stair and, where possible, from inside a firefighting lift when the lift car doors open.
- d. The signs should be mounted between 1.7m and 2m above floor level and, as far as practicable, all the signs should be mounted at the same height.
- e. The text should be on a contrasting background, easily legible and readable in low level lighting conditions or when illuminated with a torch.

7.4 Smoke Ventilation

7.4.1 Common areas.

The building is a five-storey structure (ground plus 4 upper levels) with a top floor height above ground level of 13.80 m. Common stairways and associated lobbies on upper floor levels, require smoke ventilation provisions to prevent smoke from entering the staircase.

The operation of smoke vents is upon activation of the Category L5 fire detection system provided at each level within communal stairs and lobbies. This will consist of automatic smoke detectors only, Installed solely for the purpose of smoke vent activation with no alarms. The following provisions should be provided:

- a) 1 m² Automatic Opening Vent (AOV) positioned at the head of each stair shaft, with override switches located at entrance level.
- b) All smoke vents should be located as close to the ceiling as is practicable and should be at least as high as the top of the door connecting the lobby to the stairwell (minimum 1.0m² smoke vent opening into shaft and 1.5m² opening smoke vent on the external façade).
- c) If smoke is detected in the lobby, the lobby vent on the fire floor and AOV located at the head of the stair should open simultaneously. AOV's located on other lobby levels should remain closed, even if smoke is subsequently detected on storeys other than where the initial fire is located.
- d) Secondary power supply should be provided to all actuators and controls.
- e) AOV's opening to the outside air should conform to BS EN 12101-2.

Note: free area of smoke ventilators should be measured by the total unobstructed cross-sectional area (geometric free area).

7.4.2 Natural smoke shafts

Smoke shafts serving storeys above ground level should meet the following recommendations.

- a) The smoke shaft should be fully open to the external air at the top and closed at the base.
- b) The opening at the top of the smoke shaft should be located at least 0.5 m 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).
- c) The shaft should extend a minimum length of 2.5 m above the ceiling of the highest storey which is served by the shaft.

- d) The cross-sectional area (free area) of the smoke shaft should be at least 1.5 m², with a minimum dimension of 0.85 m in any direction.
- e) The lobby or corridor vent, the opening at the head of the shaft and all internal locations (such as safety grilles) within the shaft should have a free area of at least 1.0 m².
- f) 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.
- g) The lobby or corridor vents, in the closed position, should have a minimum fire and smoke resistance performance of 30 minutes and integrity (leakage) no greater than 360 m³/h/m² when tested in accordance with BS EN 1366-2.
- h) 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 4 m of the shaft at an inclined angle (max 30°).
- i) No services other than those relating to the smoke shaft should be contained within the smoke shaft.
- j) The smoke shaft should be located at the remote end of the corridor away from the staircase.

From review of the plans, we would point out that the lobbies serving each stair would be prone to smoke logging during the means of escape phase, which would result in untenable conditions for people aiming to use the evacuation lifts. We suggest that additional lobbies or mechanical extract are considered.



Figure 17: Smoke ventilation protection to stairs

7.4.3 Ancillary Areas

Ancillary areas do not open directly onto the stair; therefore, ventilation provisions are not required.

7.5 Provision of Fire Hydrants

All premises should be provided with a supply of water for fire-fighting. Fire-fighters have to lay out hose between the water supply and the fire appliance, so these distances should be kept to a minimum. Hydrants should be located in positions that are near to building entry points (including entry points to fire-fighting shafts containing fire mains) and fire appliance parking positions as follows.

- a) For buildings provided with dry fire mains, hydrants should be provided within 90 m of dry fire main inlets.
- b) For buildings not provided with fire mains (or where the building is fitted with a wet fire main), hydrants should be provided within 90 m of an entry point to the building and not more than 90 m apart.

Water mains and hydrants should be capable of delivering a sufficient flow of water to enable effective fire-fighting to be undertaken. If the water supply takes the form of a static tank or dam, the capacity should be related to the size of the building and the risk involved. An unlimited and guaranteed natural water source providing the right quantities is also expected to be acceptable, subject to access and hard-standing for the fire appliances being provided.

Figure 18 below, details the nearest hydrant is 100m or more away from the proposed structure. Additional water provision will need to be considered.

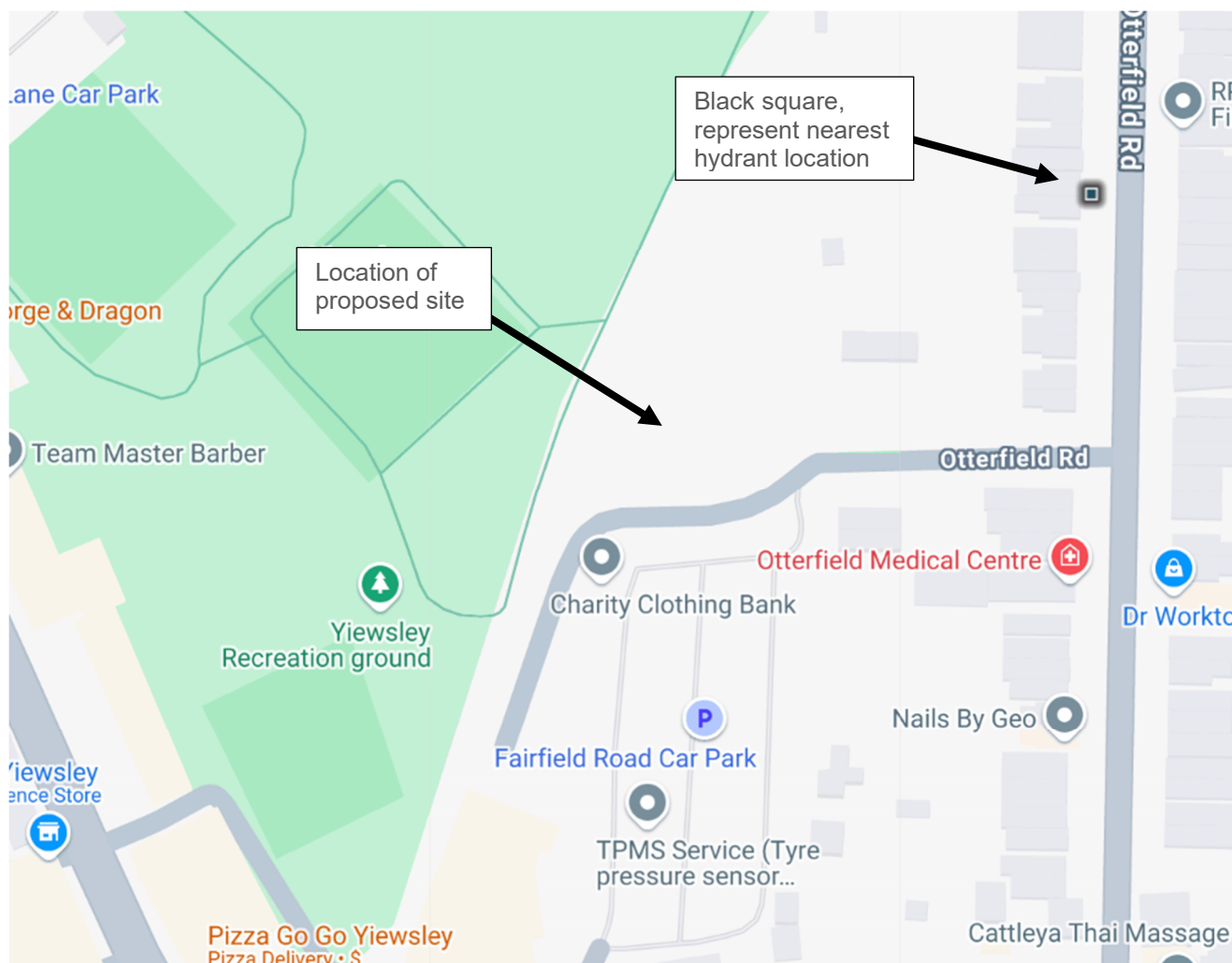


Figure 18: Fire Hydrant location.

7.6 Emergency Power Supplies.

In the event of failure of the mains power supply a secondary backup power supply will be provided to feed all life safety systems that require electricity to function as intended. The secondary supply will be appropriate for the life safety system concerned. The following life safety systems will include a backup power supply:

- Emergency lighting
- Automatic fire alarm and detection systems
- All fire alarm-interlinked fire/smoke dampers (where present)
- AOVs
- Mechanical smoke extract system

Power and control cables should be installed in accordance with BS 8519:2020, with power and control cables as Category 3.

Where practicable, power supplies should be provided via two separate intakes into the building from the same external substation. Where neither of these options is technically viable, a single intake from the external

substation may be provided as the only alternative option remaining, provided that the following recommendations are met:

- a) The life safety system should be connected to an independent distribution board used exclusively for that system.
- b) The life safety distribution board should be clearly marked at the point of isolation with a warning explaining that isolation would switch off the life safety system.
- c) The life safety distribution board should be in a separate fire-resisting enclosure (with a minimum of 60 minutes fire-resisting construction) to the primary main electrical distribution board and should not be accessible directly from the communal areas of the building or from a part of the building where dual supply is required (such as a shaft serving an evacuation lift).
- d) The enclosure surrounding the primary main electrical distribution board should be provided with a minimum of 60 minutes fire-resisting construction.
- e) The substation or transformer room should be either located outside the building or separated by 120 minutes fire-resisting construction and directly accessible from the outside.

The diverse (primary and secondary) power cables should only come together in the fire compartment housing the control panel by means of an automatic change-over switch, unless the cable route is via a fire compartment which does not open onto areas requiring protection via the relevant life safety system.

7.7 Photo Voltaic Panels.

The fire brigade should be made aware there will be photovoltaic panels installed on the roof as it may present a firefighting risk, particularly where a green roof covering could present a possible fire spread situation.

An isolation switch (isolating the DC supply from the inverter) at fire brigade access level (ground level) is required in isolating the entire roof PV array in the event of a fire.

The roof materials should provide $B_{ROOF}(t_4)$ limiting ignition and further fire spread, and the roof is open to atmosphere so no buildup of heat like in an enclosed space. PVs may self-extinguish due to the lack of fire load and the location of the parked fire tender allows for external firefighting.

Consideration should be given to 'RC62: Recommendations for fire safety with PV panel installations' - The Joint Code of Practice for fire safety with photovoltaic panel installations, with focus on commercial rooftop mounted systems and specific design considerations from the M&E designer and PV design to assist with reducing fire.

8. Fire Safety Management

The primary focus of this strategy is on two groups, the persons present in the building (and the provisions associated with ensuring safe egress), and on fire-fighter protection.

Regulation 38 of the Building Regulations requires that the Fire Strategy be brought to the attention of building management and incorporated into the risk assessment that will have to be carried out post occupation under the Regulatory Reform (Fire Safety) Order together with staff training, systems maintenance etc. and documented.

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

At completion of the project the following information is recommended to be passed onto the responsible person where applicable:

- This Fire Strategy.
- All design assumptions relating to the management of the building (where not included in the Fire Strategy).
- Escape routes, escape strategy and muster points.
- Details of all passive fire safety measures including compartmentation, cavity barriers, fire doors, self-closing fire doors and other doors equipped with relevant hardware (e.g. access controls), duct dampers and fire shutters.
- Fire detector heads, smoke detector heads, alarm call-points, detection/alarm control panels, alarm sounders, emergency communication systems, CCTV, fire safety signage, emergency lighting, fire extinguishers, wet risers and other firefighting equipment, other interior facilities for the fire service, emergency control rooms, location of hydrants outside the building, other exterior facilities for the fire service.
- Details of all active fire safety measures including:
 - Smoke control system(s) (or HVAC system with a smoke control function) design, including mode of operation and control systems.
 - Any high-risk areas (e.g. heating machinery) and particular hazards
 - As built plans of the building showing the locations of the above items.
 - Specifications of any fire safety equipment provided, including operational details, operator's manuals, software, system zoning and routine inspection, testing and maintenance schedules. Records of any acceptance or commissioning test.
 - Any provision incorporated into the building to facilitate the evacuation of disabled people.
- Any other details appropriate for the specific building.

This information is mainly provided in the form of as built plans, but supplemented in this case by the Fire Strategy, i.e. this document. Using this information, the "responsible person" should ensure a fire risk assessment is carried out for the building. It is recommended that this is recorded, kept with the other information indicated in this document and updated on a regular basis or when any significant change is made to the fire risk or facilities in these areas.

9. References

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- xv. BS 9251: 2021. *Fire sprinkler for domestic and residential occupancies*. BSI.
- xvi. BS EN 12101-2: 2017. *Smoke and heat control systems, Part 2: Natural smoke and heat exhaust ventilators*. British Standards Institution.
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- xviii. BS EN 12845, 2015 +A1, 2019. *Fixed firefighting systems – Automatic sprinkler systems – Design, installation and maintenance*. BSI Standards Limited.