

room2 Hometel Manchester

Stage 2 Fire Strategy

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Original author

Leslie Liu

Updated By

Hannah Cain

date

12.07.2024

approved

Stuart Martin

signature

date

12.07.2024

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1 Executive Summary

Buro Happold Fire Engineering has been appointed to develop a fire strategy for Homotel Manchester, Piccadilly. This report has been produced to support the architectural design for RIBA Stage 2 and outlines the fire strategy approach for the building to meet the functional requirements of Part B of the Building Regulations 2010.

The fire strategy is primarily based on the recommendations contained within BS 9999. Where the design of the building does not meet the recommendations given in BS 9999, fire engineered approaches have been identified and will be developed in accordance with BS 7974.

The Homotel project is a new hotel building incorporating an existing listed building at the lower levels, which is adjacent to Piccadilly Station in Manchester. It will be a 34-storey building, with ground floor public ancillary spaces, hotel accommodation, an rooftop bar and restaurant space.

In line with BS 9999, the risk profile (a combination of the occupancy characteristic and the fire growth rate) for this building is predominantly Ciii1, representing a sleeping occupancy profile and a medium fire growth rate with sprinklers.

This report outlines the fire safety strategy for the building and comprises of the following proposals.

Means of Escape

- Escape provisions are based on a simultaneous evacuation strategy.
- The building will be provided with 2no. protected escape stairs. 1no. of which will serve as a firefighting shaft.
- Disabled means of escape will comprise the use of an evacuation lift and refuges provided in protected lobbies on every level. A fire protected two-way emergency voice communications system will also be provided at these locations.

Fire Detection and Alarm

- An L1 automatic fire detection and alarm system will be provided throughout the building which will interface with several fire safety systems throughout.

Fire Protection

- The building will be provided with 120 minutes fire resistance to elements of structure. Dispensation is proposed to the existing listed building structure which extends only to the lower levels and does not support the new structure.
- Various fire hazard rooms, ancillary accommodation and storage spaces will be enclosed in fire resisting construction and bedroom corridors will be protected corridors.
- Fire suppression will be provided throughout in accordance with BS EN 12845. Where necessary exceptions are required alternative fire suppression may be considered.

External Fire Spread

- An initial external fire spread analysis has been carried out which will be further detailed as the design progresses and the elevations and plans become fixed. As a basis for design the new build element has a legal agreement to cantilever over an existing building and as such this elevation should be constructed as a party wall.

- A single firefighting shaft will be provided. The firefighting shaft will comprise of a firefighting stair, a firefighting lift and wet fire mains located in the firefighting lobby. Smoke ventilation will be also required in the lobbies and the staircase.

Access and Facilities for the Fire Service

2 Introduction

2.1 Aim

Buro Happold have been engaged at RIBA Stage 2 of the Homotel Manchester design process. This report has been produced to inform the architectural design for the building and is based upon the RIBA Stage 2 information received.

This report is intended to inform the design team of the proposed fire safety design approach, as well as highlighting areas where fire engineered approaches or further design development will be required. The primary focus for the Stage 2 fire strategy is to provide the outline fire safety approach to be developed to ensure the building will meet with the functional life safety requirements of Part B of the Building Regulations 2010 (as amended) (HM Government, 2010).

2.2 Design Approach

The building will be subject to the Building Regulations 2010 (as amended). The requirements for fire safety in this case are set out in Part B of the Regulations. The fire strategy is developing in line with the relevant recommendations within BS 9999 (BSI, 2017) in order to demonstrate compliance with the requirements of Part B of the Building Regulations. However, there is no obligation to adopt the recommendations given in BS 9999 if the functional requirements of the Regulations are demonstrated to be met in some other way (e.g. by the use of additional fire engineering assessments). Non-standard elements of the design are highlighted throughout with engineered approaches to be developed as the design progresses. These need to be discussed with all relevant parties.

2.2.1 BS 9999

BS 9999 considers the occupant characteristics, fire load, building properties (i.e. size and height) and management, as well as the positive impact of the passive and active fire safety measures provided (e.g. sprinklers and automatic fire detection). This creates a degree of flexibility in the choice of fire safety measures, which form the overall design solution. This allows a pragmatic design to be developed whilst providing a level of safety consistent with the functional requirements of the Building Regulations.

BS 9999 adopts a risk profile to characterise the building from which the fire safety measures are defined. The risk profile is a combination of the occupancy characteristics and the fire growth rate. This is further defined in section 3.2.

2.2.2 Regulatory Reform (Fire Safety) Order

Once the buildings become occupied, the governing legislation will be the Regulatory Reform (Fire Safety) Order (HM Government, 2005). Responsibility for complying with the Order rests with the responsible person, which is usually the building owner/occupier or any other person who may be responsible for the building or any part of the building.

2.3 Quality Design Review

The height of the building (>50m) and the use of CLT (see section 6.3) falls outside of the scope of the guidance documents, and therefore an initial review of the building characteristics has been carried out to ensure the guidance proposed remains relevant to the buildings use and design features. A more detailed Qualitative Design Review (QDR) will be set out at the start of the next stage, in accordance with BS 7974. This will include assessment with regards the proposed CLT structures.

2.4 Building Description

The room2 Homotel project is a proposed hotel building adjacent to Piccadilly Station in Manchester. The hotel will comprise a new build tower built adjacent to, and interfacing with the refurbishment of, the Barclays Bank, a listed building, originally built in 1911.

It will be a 34-storey building, with ground floor public ancillary spaces, hotel accommodation, an a rooftop bar and restaurant space. (see Figure 2-1).

There will be a vertical planting zone within the elevation of the hotel, starting on the 1st floor, passing through the hotel accommodation floors and ending on the 27th floor.

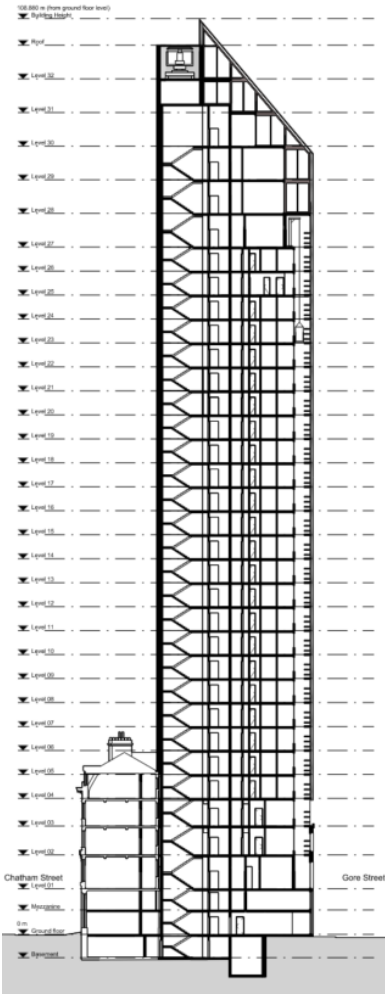


Figure 2-1 Building Section



Figure 2-2 Existing Grade II Listed Building, Former Union Bank (Google street view)

2.5 Referenced Drawings

The following drawings have been used to inform the fire strategy at this stage in the design.

Table 2—1 Referenced Information

Document Reference	Title	Revision	Date
HMP-BA-20-B01-DP-A-0	Basement floor plan	P01	09/07/24
HMP-BA-20-L00-DP-A-0	Ground floor plan	P04	09/07/24
HMP-BA-20-M01-DP-A-0	Mezzanine floor plan	P03	09/07/24
HMP-BA-20-L01-DP-A-0	Level 1 floor plan	P01	09/07/24
HMP-BA-20-L02-DP-A-0	Level 2 floor plan	P03	09/07/24
HMP-BA-20-L03-DP-A-0	Level 3 floor plan	P05	09/07/24
HMP-BA-20-L04-DP-A-0	Level 4 floor plan	P04	09/07/24
HMP-BA-20-L05-DP-A-0	Level 5 floor plan	P02	09/07/24
HMP-BA-20-L06-DP-A-0	Level 6-20 floor plans	P02	09/07/24
HMP-BA-20-L21-DP-A-0	Level 21-24 floor plans	P02	09/07/24
HMP-BA-20-L25-DP-A-0	Level 25-26 floor plans	P02	09/07/24
HMP-BA-20-L27-DP-A-0	Level 27 floor plan	P02	09/07/24
HMP-BA-20-L28-DP-A-0	Level 28 floor plan	P01	09/07/24
HMP-BA-20-L29-DP-A-0	Level 29 floor plan	P01	09/07/24
HMP-BA-20-L30-DP-A-0	Level 30 floor plan	P01	09/07/24
HMP-BA-20-L31-DP-A-0	Level 31 floor plan	P02	09/07/24
HMP-BA-20-L32-DP-A-0	Level 32 floor plan	P02	09/07/24
HMP-BA-20-R00-DP-A-0	Planning Roof	P01	09/07/24
HMP-BA-21-EE-DP-A-0	Planning East Elevation	P05	09/07/24
HMP-BA-21-EN-DP-A-0	Planning North Elevation	P06	09/07/24

Document Reference	Title	Revision	Date
HMP-BA-21-ES-DP-A-0	Planning South Elevation	P05	09/07/24
HMP-BA-21-EW-DP-A-0	Planning West Elevation	P05	09/07/24
HMP-BA-20-SN1-DP-A-0	Planning North Section	P03	09/07/24
HMP-BA-20-SW1-DP-A-0	Planning West Section	P04	09/07/24
HMP-BA-10-L00-DP-A-0	Planning Site Plan	P04	09/07/24

3 Means of Escape

3.1 Evacuation Strategy

The building will operate on a simultaneous evacuation strategy, whereby upon activation of the fire alarm system, all occupants in the building will evacuate at the same time.

3.2 Risk Profile

BS 9999 adopts a risk profile to characterise the building from which the fire safety measures are defined. The risk profile is a combination of the occupancy characteristics and the fire growth rate.

The occupancy characteristic is primarily determined by the occupants’ level of familiarity with the building and their state of awareness in terms of them being awake or asleep:

- In the sleeping accommodation, the occupants are most likely to be asleep, and are considered a Type **Ciii** (short term) profile.
- In the museum and restaurant areas (i.e. the public spaces), the occupants are most likely to be awake and unfamiliar with their surroundings, and are considered a Type **B** profile.
- In the back of house (BoH) areas (i.e. the staff spaces), the occupants are most likely to awake and familiar with their surroundings, and are considered a Type **A** profile.

The fire growth rate is primarily determined by the contents in the building and the fire risk they present to the building.

- In all of the building, the fire growth rate is expected to be medium, reducing to a **slow** fire growth rate with the provision of sprinklers, and are considered level **1** overall.

The risk profiles within the building are summarized in Table 3—1:

Table 3—1 Risk Profile

Area	Risk Profile (sprinklered)
Sleeping Accommodation	Ciii1
Reception/Museum/Restaurant	B1
BoH areas	A1

3.3 Design Occupancy

For the purposes of means of escape provisions, the building occupancy is based on a number of factors.

The building occupancy and reasoning is shown in Table 3—2.

Table 3—2 Design Occupancy

Level	Use	Expected Occupancy	Reasoning
00	Reception & Office	113	Floor Space Factor (1 m²/person)
00	Café	32	Number of seats
0M	Gym	16	Floor Space Factor (3 m²/person)
0M	Meeting rooms	58	Floor Space Factor (1 m²/person)
01	Net Zero Museum	19	Floor Space Factor (5 m²/person)
01	Auditorium / Meeting rooms	159	Floor Space Factor (1 m²/person)
02 – 04	Hotel Accommodation	102 (34/floor)	2 people per bedroom

Level	Use	Expected Occupancy	Reasoning
05 – 24	Hotel Accommodation	400 (20/floor)	2 people per bedroom
25-26	Hotel Accommodation	32 (16/floor)	2 people per bedroom
27*	Kitchen	7	Floor Space Factor (7 m²/person)
28*	Restaurant	140	Number of seats
29*	Bar	184	Number of seats
30*	Roof Terrace	40	Number of seats
31	Amenity Space	72	Floor Space Factor (1m²/person)
32	Maintenance access only	0	
Total		1374	

Note: The 2no. stairs are in close proximity to each other, where a single fire at the bar/restaurant levels may compromise both storey exits. A corridor/partition is to be included in the layouts to ensure separation of the storey exits from the floor plate.

3.4 Horizontal Escape

3.4.1 Travel Distances

Maximum travel distances are dependent on the assigned risk profile. Due to the provision of an L1 automatic fire detection and alarm system and sprinklers, the travel distances are increased from the minimum standards.

The travel distances within the different spaces are summarized in Table 3—1:

Table 3—3 Travel Distance Limits

Area	Risk Profile	Escape in 1 direction (m)	Escape in more than 1 direction (m)
Sleeping Accommodation	Ciii1	13	27
Reception/Museum/Restaurant	B1	27.6	69
Bar*	B1	20.7	51.75
BoH areas	A1	29.9	74.75

*Note: Travel distance in bar areas are reduced due to the presence of alcohol.

3.4.2 Number of Exits

The number of exits from a storey (or within an area/room) is based on the following:

Table 3—4 Number of exits from a storey or room

Number of persons	Minimum Number of Exits
≤ 60 persons	1 exit
60 and ≤ 600 persons	2 exits
≥600 persons	3 exits

3.4.3 Final Exit Widths

Final exits from ground floor are direct to external and independent of the stairs. The minimum clear width of all final exits will be not less than 850mm.

Escape from stairs should be direct to external air or via a protected route.

Final exits from the base of the stairs will be at least as wide as the stairs it serves. The corridor and final exit from the firefighting stair will be 500mm wider than the stair width to allow fire service access.

3.5 Vertical Escape

The escape capacity of the stairs is determined by the clear width of the stairs and the number of floors the stairs serve.

The building is served by 2 protected escape stairs, both of which are 1100mm clear width.

The widths and capacities of the staircases are shown in Table 3—5.

Table 3—5 Stair Capacities

Stair	Storeys served	Clear Width (mm)	Stair sizing (mm/person)	Capacity
1	0M-30 (31)	1100	1.5	733
2 (Firefighting)	0M-30 (31)	1100	1.5	733
Total				1466

3.6 Means of Escape for Disabled People

Due to the height of the building, an evacuation lift will be provided with the associated disabled refuge and emergency voice communication (EVC) system. This is not directly associated with a stair, although accessed via a protected corridor, therefore a secondary refuge will be provided in the firefighting lobby.

4 Fire Safety Systems

4.1 Fire Detection and Alarm

An L1 automatic fire detection and alarm system will be installed throughout, designed to the relevant parts of BS 5839-1 (BSI, 2017). The type of detection will be suited to the hazard within the area.

4.2 System Interactions

The fire detection and alarm system will also be used to:

- release any held open fire doors
- release automated locks
- close off gas supplies
- shut down air handling equipment not associated with smoke ventilation
- command lifts to ground
- open smoke vents to firefighting lobbies activate smoke control within the atrium

4.3 Fire Curtains

Fire curtains are proposed at ground floor to protect the final exit from the evacuation lift and the non-firefighting shaft side of the dual-entry firefighting lift. The fire curtains should be provided with smoke seals and be designed in accordance with BS 8524-1 (BSI, 2013) & BS 8524-2 (BSI, 2013) (including all annexes).

The fire curtain should meet the following criteria:

- Must achieve 60 minutes integrity and radiation (EW) as well as a smoke rating.
- Will deploy on activation of the fire alarm.
- There should be notification mechanisms in place to warn:
 - Occupants when the curtain is descending (visually and by sound; flashing beacons + alarm)
 - Staff when the path of the fire curtain is obstructed (this can be done by installing a beam detection that detects when there is an object under the fire curtain that would block its descent).
 - The curtain needs to be fail safe in the closed position, or be provided with dual power supply.

4.4 Automatic Fire Suppression System

As the height of the top floor is greater than 30m, the building will be provided an automatic fire suppression installation (i.e. sprinklers). The sprinkler system is to be designed and installed in accordance with BS EN 12845 (BSI, 2015) within all areas.

4.5 Emergency Escape Lighting

A system of non-maintained self-contained emergency luminaires with a back-up supply of 1 hour will be provided throughout the common areas of the building. 3 hours will be provided to all other areas. Emergency lighting will be designed and installed in accordance with BS 5266-1 (BSI, 2016)

Any areas of the building covered by a licence relating to the consumption of alcohol, will require an enhanced maintained installation.

4.6 Emergency Escape Signage

All exits and routes to exits will be clearly marked with appropriate emergency escape signs so that the occupants can easily determine their most direct route to a place of safety in the event of an emergency. The system will be designed and installed in accordance with BS 5499-1 (BSI, 2002) and BS ISO 3864-1 (BSI, 2011).

4.7 Secondary Power Supplies

A number of building systems will require a secondary / back up emergency power supply in accordance with BS 8519 (BSI, 2020).

5 Internal Fire Spread (Linings)

All internal surfaces and finishes provided throughout are to meet the minimum recommendations of The Building Regulations. For the purposes of those regulations, this is all wall and ceiling linings only and does not apply to floor coverings.

The choice of materials for wall and ceiling linings needs careful consideration as they can significantly affect the spread of fire within a building and its growth rate. To ensure that rapid growth and spread do not occur, surface spread of flame values for coverings of surfaces forming the wall and ceiling linings will satisfy the following criteria.

All references to surface spread of flame are based on the performance tests results when the material and products are tested in accordance with BS 476-6 (BSI, 1989) and BS 476-7 (BSI, 1997) and the newer euro codes.

Table 5—1 Classification of Linings

Location	National Class	European Class
Escape routes common area circulation routes.	0	B-s3,d2
Rooms more than 30m ²	1	C-s3,d2
Rooms less than 30m ²	3	D-s3,d2

Note 1: The national classifications do not automatically equate to the equivalent European classifications; therefore, products cannot typically assume a euro class unless they have been specifically tested.

Note 2: When the classification includes ‘s3-d2’ this means that there is no limit set for smoke production or flaming droplets.

The following are excluded from the performance requirements of surface spread of flame:

- doors and door frames
- window frames into which glazing is fitted
- architraves, cover moulds, picture rails and similar narrow small members
- fitted furniture, i.e. demountable sanitary “back panels”

The provisions do not apply to the upper surfaces of staircases (i.e. treads and risers) because they are not significantly involved in a fire until it is well developed.

6 Internal Fire Spread (Structure)

6.1 Structural Fire Protection

The structural fire resistance of the building is based on the height of the topmost occupied floor. A C1 risk profile above 30m in height requires 120 minutes structural fire resistance and sprinklers.

Elements of structure include the following:

- a member forming part of the structural frame of a building or any other beam or column
- a loadbearing wall or loadbearing part of a wall
- a floor
- a [loadbearing] external wall
- a compartment wall

Exclusions from the provisions for elements of structure and do not require any fire resistance include a structure that only supports a roof, unless:

- i. the roof performs the function of a floor (i.e. the external terraces which can be used for corporate and similar events, etc; or,
- ii. the structure is essential for the stability of an external wall which needs to have fire resistance; or,
- iii. the structural beam/column forms or supports part of a fire resisting wall; or,
- iv. the failure of the roof would result in disproportionate collapse or unacceptable consequences for occupants below e.g. in an arena

6.2 Existing Building

The existing building is the Barclays Bank, built in 1911, and will not meet the standards for fire resistance for this new building. The structure is likely to have been designed to a lower fire resistance period. Prescriptively, any structure retained for the final building should be upgraded to the new standards and meet 120 minutes fire resistance.

Regarding the existing building, increasing fire protection to elements of structure would be difficult whilst retaining the listed status. As it is proposed that this part of the building remains at the same height as previously, the fire strategy approach will be to retain the existing building’s fire resistance period, whilst any new elements will meet the current fire safety standards. Collapse of the existing building should not detrimentally affect the new building.

6.3 Cross Laminated Timber Structure

The use of cross laminated timber (CLT) has been proposed in the use of the structural slab, as a replacement to the use of concrete. It has been proposed to use CLT for the lower levels on the mezzanine and first floors, and the top levels on the 27th, 28th, 29th floors and roof terrace.

Design note: CLT should not be used in spaces where there is a high fire risk, such as the substation on the ground floor, and where non-combustible material cannot be used, such as the firefighting shaft.

Design note: it has been proposed that exposed CLT slabs are used. The encapsulation of the slabs should be considered. Otherwise, a burn-out assessment would need to be conducted to demonstrate that the building can survive the worst-case realistic fires

Design note: it has been proposed that the restaurant levels (27th – 30th floors) will be a 3-storey compartment with exposed CLT slabs. This is a non-standard design, as these should be compartment floors between each storey.

Additionally, the CLT slabs could lead to very long and severe fires, which would need to be considered in the fire resistance design of the non-timber structural elements.

The use of CLT will be assessed in more detail at the next design stage.

6.4 Compartmentation

The building will be provided with compartment floors throughout.

The lower levels will have voids connecting them creating a triple height space. the approach to this will be detailed as the design progresses and capitalises on the internal fire separation at these levels due to the different room uses.

Bedroom corridors will be formed as protected corridors. Due to the provision of hobs within the bedrooms it is proposed to uplift the passive fire safety provision by separating each bedroom suite by 30 minutes fire resisting construction. This is in keeping with enclosing hazard spaces and aims to prevent rapid fire spread and a fire growing excessively large for fire service intervention.

All places of special fire hazard will be enclosed in fire resisting construction relative to the risk they present.

Life safety rooms will be enclosed in 120 minutes fire resisting construction.

6.5 Vertical Planting Zone

There is a vertical planting zone within the elevation. This is relatively low fire load with the aspiration to grow plants in water with added minerals. The proposal is to treat the space as an atrium separating it by fire resisting construction and providing smoke vent with make up air.

The vertical planting zone will be designed as an atrium, as it passes through compartment floors. As such, it will be enclosed in 30 minute fire resisting construction. The ventilation system will aim to remove any heat and smoke.

Design note: this approach will be developed at the next stage and discussed with all stakeholders.

6.6 Service Risers and Service Penetrations

All service risers will either be designed as protected shafts or fire stopped at floor level.

If they are constructed as protected shafts, where a service penetrates the enclosing walls of those shafts they will be adequately fire stopped with a proprietary sealing product achieving the required fire resistance.

In addition to protected shafts, any services which pass through any fire resisting construction it will be protected from promoting fire spread by the provision of a proprietary sealing system which has been shown by test to maintain the fire resisting construction it penetrates, or, where the pipe is non-combustible fire stopping around the pipe, keeping the opening as small as possible.

Note: services must not pass through a firefighting shaft and service risers must not open into a fire fighting shaft at any level.

7 External Fire Spread

Fire spread from building to building by radiation is dependent on the:

- distance between, and orientation of, the building of origin and the neighbouring structure;
- extent of the building surface capable of transmitting heat i.e. the area of non-fire resisting façade; and,
- intensity of the source of radiation i.e. the building usage.

The boundary at which the radiation intensity is assessed is known as the relevant boundary. The relevant boundary is usually be taken as the site boundary or halfway across adjacent roads. When two buildings are on the same site a notional boundary may be assumed to exist between the two buildings.

Compartment floors and sprinklers are provided throughout the building. These measures limit the external fire spread and consequently limit the requirements for any protected areas of façade which will be determined at the next design stage when the detailed assessments are carried out.

The new building has legal permission to cantilever over an existing building, therefore the red line boundary effectively sits within the new tower and this elevation must be fire resisting (as if it were a party wall).

7.1 External Elevation Cladding

7.1.1 Surface Spread of Flame

Any residential building with a top storey over 18m should achieve **A2-s1, d0**.

7.1.2 Construction of External Walls and Specified Attachments

In a building containing residential elements with a storey 18m or more above ground level, any materials that form part of the external wall and any specified attachments (e.g. balconies or a solar panel attached to an external wall), must be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1:2007+A1:2009 (BS EN 13501-1: Fire classification of construction products and building elements. Classification using data from reaction to fire tests, 2018). This 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 that is pitched at an angle of more than 70 degrees to the horizontal and 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.

7.1.3 Roof Coverings

Roof coverings may be designated in accordance with Table 7-1 below.

Table 7-1 - Roof covering requirements

Distance from relevant boundary	Minimum designation of roof covering (National class BS 476-3 (BS 476-3: Fire tests on building - Classification and method of test for external fire exposure to roofs, 2004))	Minimum designation of roof covering (European class BS EN 13501-5 (BS EN 13501-5: Fire classification of construction products and building elements. Classification using data from external fire exposure to roof tests, 2016))
Less than 6m	AA, AB or AC	B _{ROOF} (t4)
At least 6m	BA, BB or BC	C _{ROOF} (t4)

Roof coverings of AA, AB or AC are required on a deck of material of limited combustibility to both sides above compartment walls for a distance of 1.5m either side of the wall.

8 Fire Service Access

8.1 Introduction

The building must be designed and constructed in a manner that will fulfil the following criteria in terms of fire service access and facilities:

- To provide sufficient means of external access to enable fire appliances to approach the building for effective use.
- To provide sufficient means of access into and within the building for firefighting personnel to effect rescue and fight fire.
- To provide sufficient internal fire mains, as appropriate, to assist fire-fighters in their tasks.

The topmost occupied floor is in excess of 50m above fire service access level which is taken as the lowest adjacent ground level.

8.2 Vehicle Access

The external roadways leading to the building and those provided around the building where pump appliances can drive and/or park will be designed to meet the criteria given in Table 8—1.

Table 8—1 Typical Fire Vehicle Access Route Minimum Dimensions

Appliance Type	Minimum Width of Road between Kerbs (m)	Minimum Width of Gateways (m)	Minimum Turning Circle between Kerbs (m)	Minimum Turning Circle between Walls (m)	Minimum Clearance Height (m)	Minimum Carrying Capacity (tonnes)
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High Reach	3.7	3.1	26	29	4	17

8.3 Firefighting Shafts

Any building with a height exceeding 18m should be provided with a minimum of one firefighting shaft. Since the building is sprinkler protected all parts of the floor plate should be within 60m of fire main outlet measured on a route suitable for laying hose.

The firefighting shaft should include:

- a smoke ventilated firefighting stair (achieved via a 1.0m² AOV at the head)
- smoke ventilated firefighting lobbies
- a firefighters’ lift

The fire-fighting shafts will be enclosed in 120 minutes fire resisting construction (REI). The fire-fighting lobbies will contain the wet rising main outlet.

Where a protected corridor for fire-fighting access also forms part of the means of escape from the accommodation, it will be 500mm wider than that required for means of escape purposes to allow room for fire and rescue service personnel to move towards the fire-fighting shaft.

Only services associated with the firefighting shaft should pass through or be contained within the firefighting shaft. A firefighting shaft should not contain any cupboards or provide access to service shafts serving the remainder of the building.

8.3.1 Firefighting Lobbies

Firefighting lobbies will be provided to each shaft at every level. The firefighting lobbies are not less than 5m² and not greater than 20m² in areas and will be provided with mechanical smoke ventilation system.

8.3.2 Firefighters’ Lift

The firefighters’ lifts will be designed in accordance with BS EN 81-72 (BSI, 2020) and incorporate a communication system. There should be sufficient provision to minimise water ingress into the fire-fighting lift shaft. The firefighters’ lifts should not be used for transporting goods at any time. The entrance to the lift will be through the ventilated and protected fire-fighting lobby.

Design note: the firefighters’ lift will be designed as a dual-entry lift. This is a non-standard design, as it is the only firefighting lift within the building. The lift lobby on the non-firefighting shaft side should be enclosed by fire resistant construction. This is the case on the upper floors, however fire curtains are currently proposed on the ground floor, which may not allow the robustness required. This is to be developed at the next stage.

8.4 Fire Mains

For buildings where the highest floor exceeds 50m from the firefighters’ access level, wet fire mains are required to be installed.

A wet rising fire main will be provided in the firefighting shaft. Fire mains will be designed and installed in accordance with BS 9990 (BSI, 2015). Wet rising main outlets will be provided on all levels.

8.5 Hose Coverage

The building will be sprinkler protected and all parts of the internal floor plates should be within 60m of a fire main outlet in a firefighting lobby, as measured on a route suitable for laying a hose.

9 References

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Leslie Liu
Buro Happold Limited
2nd Floor, Eastgate
2 Castle Street, Castlefield
Manchester
M3 4LZ
UK

T: +44 (0)161 233 5000
Email: leslie.liu@burohappold.com