

A tall, modern building with a glass facade and red structural elements is illuminated at night. It stands next to a tram line with a tram visible. Other city buildings are in the background under a cloudy sky.

2-4 Whitworth Street Manchester Outline Fire Safety Strategy

Revision: R02

Date: 18/11/2024

Project Number: MA24024



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Quality Management

Revision	Date	Comment	Author	QA & Technical Review	Approver
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R02	18/11/2024	Updated to accommodate minor design team comments	BK	-	-

Table of Contents

1	Introduction.....	6
1.1	Appointment	6
1.2	Applicable guidance and legislation	6
1.3	Basis of design.....	7
1.4	Reference Information.....	7
2	Project Description	8
2.1	The site.....	8
2.2	Description of the building	8
2.3	Risk Profiles	9
3	Preliminary Qualitative Design Review.....	10
3.1	General	10
3.2	Preliminary Review.....	10
4	Summary of Fire Safety Systems.....	12
4.1	Fire Detection and Alarm System.....	12
4.2	Automatic Fire Suppression System	12
4.3	Smoke Ventilations System	12
4.4	Emergency Lighting	13
4.5	Emergency Power.....	13
4.6	Evacuation Alert Systems.....	13
5	Means of Warning and Escape.....	14
5.1	Evacuation strategy	14
5.2	Horizontal Means of Escape	14
5.3	Final Exits	15
5.4	Evacuation of Mobility Impaired Persons (MIPs)	15
6	Internal Spread of Fire.....	18
6.1	Linings.....	18
6.2	Structural Fire Protection.....	18
6.3	Compartmentation and Fire Resisting Construction.....	18
6.4	Fire Doors	18
6.5	Fire and Smoke Curtains.....	18
6.6	Cavity Barriers.....	19
8	External Spread of Fire	20
8.1	External wall construction	20
8.2	Roof coverings	20
8.3	Space Separation Assessment.....	20
9	Access and Facilities for the Fire & Rescue Service	23
9.1	Internal Firefighting Facilities	23
9.2	External Firefighting Facilities.....	23
9.3	Other Firefighting Provisions.....	24
10	References.....	25
	Appendix A – Fire Statement.....	26

List of Figures

Figure 1: Site location (an extract from Google earth).....	8
Figure 2: Ground floor general arrangement	9
Figure 3: First floor general arrangement.....	9
Figure 4: Typical residential floor general arrangement (levels 23-33)	9
Figure 5: Ventilation system arrangement on the residential floors (levels 3-43).....	12
Figure 6: Ventilations system arrangement on the 2nd floor	13
Figure 7: Ventilations system arrangement on the ground floor	13
Figure 8: Open plan unenclosed kitchen layout and travel distance within flats	14
Figure 9: Recommended escape route provisions in multi stair buildings (Figure 7 – BS 9991)	14
Figure 10: Travel distance mark-up on a typical residential floor.....	16
Figure 11: Final exits and travel distance mark-up on ground floor	16
Figure 12: Travel distance mark-up on the 2nd floor.....	16
Figure 13: Space separation measurements for ground floor layout	21
Figure 14: Space separation measurements for 1st floor layout	21
Figure 15: Space separation measurements for 2nd floor layout.....	22
Figure 16: Space separation measurements for typical residential floor layout.....	22
Figure 17: FRS access roads and building access points	23

List of Tables

Table 1: Reference information	7
Table 2: Building characteristics	8
Table 3: Non-residential area risk profiles	9
Table 4: Preliminary QDR considerations.....	10
Table 5: Summary of sprinkler system recommendations	12
Table 6: Classification of linings	18
Table 7: Fire resistance of elements	19
Table 8: Roof covering designations.....	20
Table 9: External fire spread allowable unprotected area %.....	21
Table 10: Pump-type firefighting appliance access route specifications	23

1 Introduction

1.1 Appointment

OFR Consultants have been appointed by Glenbrook Property to develop the outline fire strategy for the 2-4 Whitworth Street development in Manchester. This scheme will consist of a single tower which comprises of 44 storeys (130.65 m in height to the topmost occupied storey). The building will primarily contain residential dwellings, with the inclusion of some residential amenity spaces on the first three levels (ground, first, and second floors). The site will be located in Whitworth Street between Cameron St and Bugle St.

This document is the outline fire strategy for the development at RIBA Stage 2. The intent of the document is to provide fire safety advice and to define the key fire strategy elements, that will be further developed during RIBA Stage 3.

This report specifically covers life safety issues only. Property protection issues do not fall under the scope of this document. This fire strategy will allow the design to be discussed provide information to the client, principal designer and wider design team. As the project progresses, a detailed fire strategy, including all relevant analyses, shall be developed, and integrated into the final design for submittal for approval by the Building Control body as part of the Gateway 2 submission. Ultimately the design will need to be fully translated into the completed scheme using due skill and care by competent persons to ensure the requirements of the Building Regulations are met.

During the submission of detailed planning applications, there is a statutory requirement to provide a Fire Statement for 'relevant buildings' (i.e., inclusive of residential >7no. storeys), and to engage with the Health and Safety Executive (HSE) as a Statutory Consultee as part of Planning Gateway 1 (PG1). This has been made a requirement for any submissions made on or after 1st August 2021. The fire statement for this scheme is included in Appendix A – Fire Statement.

This report is based upon the information referenced in Section 1.4. It is to be noted that any insurers' requirements should be made known to OFR to be included in the fire strategy.

1.2 Applicable guidance and legislation

1.2.1 The Building Regulations 2010 (as amended)

Fire safety of building works is legislated by the Building Regulations 2010 (including amendments up to 2024) [1]. The Regulations have been enacted under the Building Act 1984 and are published by the Controller of HMSO. The Regulations impose requirements on people carrying out building work. The requirements are functional rather than prescriptive in nature which means that the designer is given the freedom to choose the method they use to satisfy the legislation.

This strategy has been developed to address the requirements of Part B of the Regulations that governs fire safety of building design. These requirements are segregated into distinct aspects of building design as follows:

- B1 – Means of warning and escape;
- B2 – Internal fire spread (linings);
- B3 – Internal fire spread (structure);
- B4 – External fire spread; and
- B5 – Access and facilities for the fire and rescue service.

All aspects of the fire safety design remain subject to be reviewed and approved during the relevant gateway stages.

The fire strategy, in its finalised form is to comprise part of the information pack handed over to the building operators under Regulation 38 to assist the responsible person to operate and maintain the building with reasonable safety in accordance with the Regulatory Reform (Fire Safety) Order 2005 "FSO" [2].

1.2.2 The Building Safety Act 2022

The Building Safety Act achieved royal assent on the 28 April 2022. This Act has resulted in the following secondary legislation being created which makes amendments to the Building Act 1984 and the Building Regulations:

- Building Regulations etc. (Amendment) (England) Regulations 2023 [3].
- Building (Higher-Risk Buildings Procedures) (England) Regulations 2023 [4].
- Building (Approved Inspectors etc. and Review of Decisions) (England) Regulations 2023 [5].

This building contains seven or more storeys and is therefore defined as a Higher Risk Building. This project would therefore be subject to both Gateway 2 and Gateway 3. The Client will need to appoint Duty holders (Principal Designer and Principal Contractor) as defined under the Building Regulations etc. (Amendment) (England) Regulations 2023. The roles have been modelled on those in the CDM.

1.2.3 The Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform [Fire Safety] Order 2005 (FSO) came into effect in October 2006 [2]. The Order applies to all non-domestic premises in England and Wales, including the common parts of blocks of flats or houses in multiple occupation. It has subsequently been amended by the Fire Safety Act 2021 [6], in explicitly bringing structure, external walls (inclusive of specified attachments) and apartment entrance doors under the remit of the Order. Secondary legislation setting out regulations for these changes are formalised in the Fire Safety (England) Regulations 2022 [7]. Furthermore, the Building Safety Act 2022 has further strengthened the Order – particularly with respect to the duties of the 'Responsible Person' (RP).

The RP under the FSO has a duty to make the premises safe and must undertake regular fire risk assessments. It is the responsible person who will be held accountable under the new legislation for any breaches in fire safety.

In workplaces, the Responsible Person is likely the employer. In other cases, it is likely the owner or anyone who has any extent of control over the premises who would be considered as the Responsible Person. Under the Order, the Responsible Person must carry out a fire safety risk assessment and implement and maintain a fire management plan. The fire risk assessment should be kept under regular review and reassessed if the use of the building has been varied or a material alteration has been made. The significant findings must then be recorded, along with the measures taken to address the risks identified. A competent person should carry out the fire risk assessment.

1.2.4 The Construction (Design and Management) Regulations 2015

The strategy has been developed in cognisance of the Construction (Design and Management) Regulations 2015 [8] (CDM 2015), which sets out what designers are required to consider in order to protect anyone involved in the construction or ongoing use of a project. The strategy does not address site fire safety during the building works. The Health and Safety Executive (HSE) issues guidance notes on identifying and managing fire precautions during the works and they should be consulted by the appropriate party.

1.3 Basis of design

The guidance of BS 9991:2015 [9] has been used as the principal basis for this fire strategy, supplemented by the further documents referenced therein. Ultimate responsibility for the implementation of the strategy by the building management team rests with the responsible person for the building, as defined in the RRO. The guidance of BS 9999:2017 [10] has been used in the design where appropriate (i.e. for the non-residential areas in the lower floors)

The guidance of Approved Document B (AD B) Volume 1: Dwellings, 2019 edition [11], incorporating up to 2026 amendments [1], has been used to supplement the guidance in BS 9991 as this has recently been updated to include the advice relating to the new Regulation 7(2) with regards to the limitations and restrictions on material in external wall construction and to the provisions related to evacuation lifts/ shafts.

Alternative fire engineering methods are employed to support solutions where strict adherence to the codes would conflict with the wider aspirations for the scheme, or where the prescriptive expectations would be applied beyond their remit/scope. Departures from the prescriptive codes are identified and alternative proposals (and associated analysis) are documented. As the height of the building is over 50 m, a Qualitative Design Review (QDR) will be carried out for this scheme and a preliminary QDR which outlines the main discussion points is included in in Section 3.

In accordance with the fire safety engineering principles detailed in PD 7974 [12], all fire precautions are designed based on there being a single seat of fire.

1.4 Reference Information

This report has been prepared based on the drawings listed in Table 1.

Table 1: Reference information

Drawing No.	Title	Revision	Date
7196-SRA-ZZ-00-DR-A-02100	General Arrangement Ground Floor Plan	P01	18/11/24
7196-SRA-ZZ-01-DR-A-02101	General Arrangement First Floor Plan	P01	18/11/24
7196-SRA-ZZ-02-DR-A-02102	General Arrangement Second Floor Plan	P01	18/11/24
7196-SRA-XX-ZZ-DR-A-02051	General Arrangement - Typical Floor Levels 3-22	P01	18/11/24
7196-SRA-XX-ZZ-DR-A-02052	General Arrangement - Typical Floor Levels 23-33	P01	18/11/24
7196-SRA-XX-ZZ-DR-A-02053	General Arrangement - Typical Floor Levels 34-40	P01	18/11/24
7196-SRA-XX-ZZ-DR-A-02054	General Arrangement - Typical Floor Levels 41-43	P01	18/11/24
7196-SRA-XX-XX-DR-A-02011	Site Plan Proposed	P01	18/11/24

2 Project Description

2.1 The site

The proposed development site is situated to the south of Manchester’s Civic Quarter, specifically along Whitworth Street West, between Cameron Street and Bugle Street next to the South Deansgate junction, and in proximity to Deansgate train station. This site spans approximately 0.17 hectares.

Presently, the site is divided into two parcels, namely No. 2 and No. 4 Whitworth Street West, with Rowendale Street, running through the middle. To the north, the site is bordered by Whitworth Street West, while to the south, it adjoins the Grade II Listed Manchester South Junction and Altrincham Railway Viaduct. Bugle Street and Cameron Street flank the site on both sides. The two building parcels will be combined together for the newly proposed scheme, with the acquirement of the Rowendale Street.

The proposed site location with the surrounding landmarks is shown in Figure 1.

2.2 Description of the building

This scheme includes the design and construction of a new high-rise residential building on a site currently comprising two former warehouse buildings at 2 and 4 Whitworth Street West in Manchester. This residential building is a single tower which will comprise of 44 storeys where the top of the roof parapet wall reaches an height of 136.5 m from the ground floor.

The ground floor, level 01 and 02 will include non-residential and ancillary areas such as bike store, lounges, a gym, plant rooms etc. On the 2nd floor, there are balconies extended outwards towards the feature columns at the side elevations. The upper floors will comprise of residential dwellings in a mixture of 1-bedroom, 2-bedroom and 3-bedroom apartments. Several floor plans are shown in Figure 2, Figure 3 and Figure 4.

The maximum floor area in the proposed building layout is found in the residential floors where it is measured c. 761 m².

Key characteristics of the building are outlined in Table 2.

Table 2: Building characteristics

Key Characteristics		Description
Building height (to the rooftop parapet wall top)		+136.5 m
Area of a typical residential floor		761 m ²
Building areas	Ground floor	Lounges, Reception, Bin store, Substation, LV switchroom, Post room, Management office, Bike store, Comms intake
	First floor	Lounges, Kitchenettes, Management room, Wet water riser, Generator, Life safety switch, Domestic water storage, Sprinkler – Resi, Condenser Compound
	Second floor	Lounges, Kitchenettes, Gym, Studios
	Floors 03 - 43	Residential flats



Figure 1: Site location (an extract from Google earth)

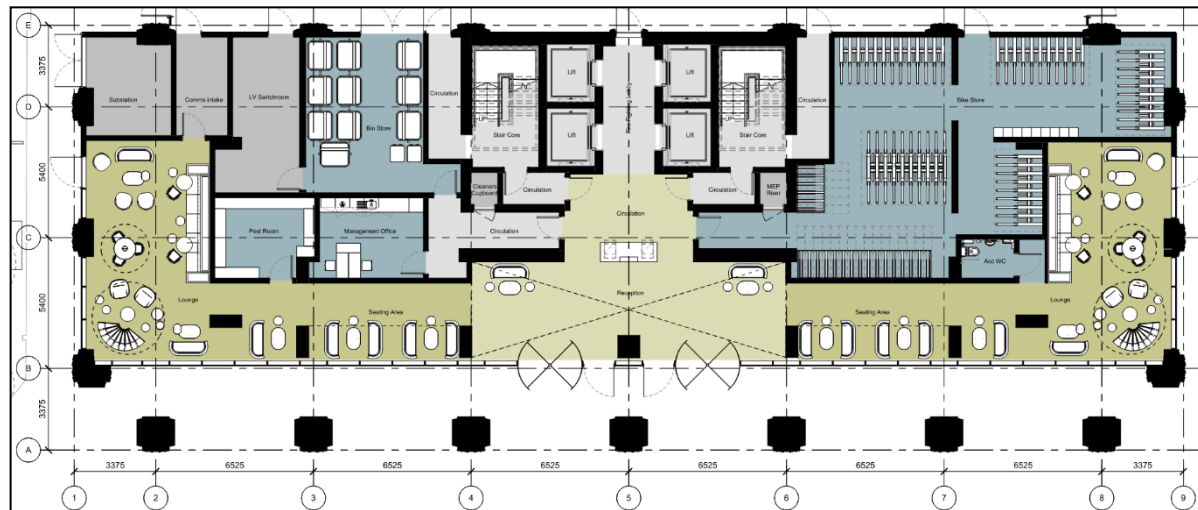


Figure 2: Ground floor general arrangement

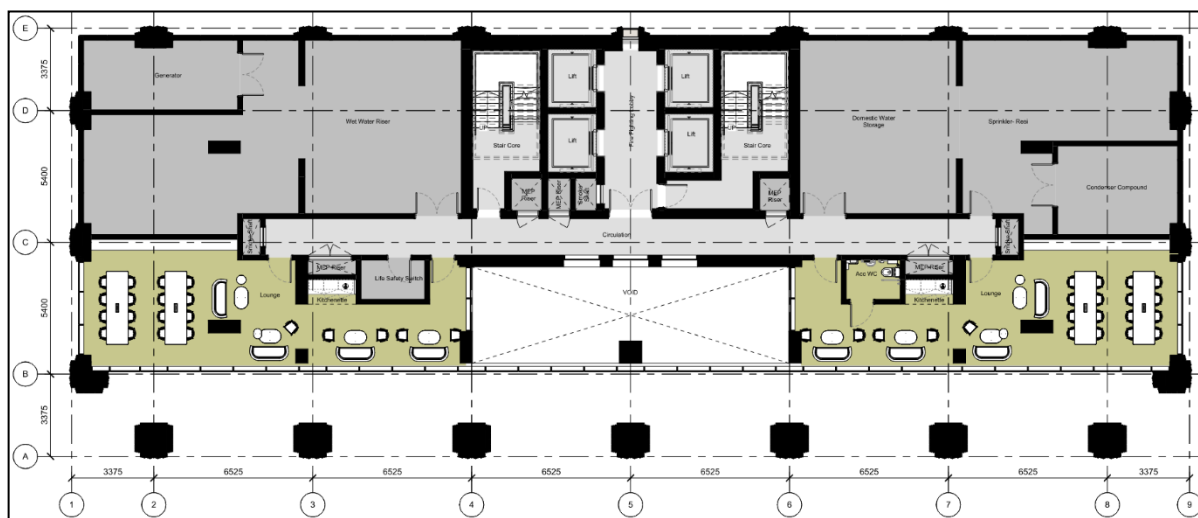


Figure 3: First floor general arrangement

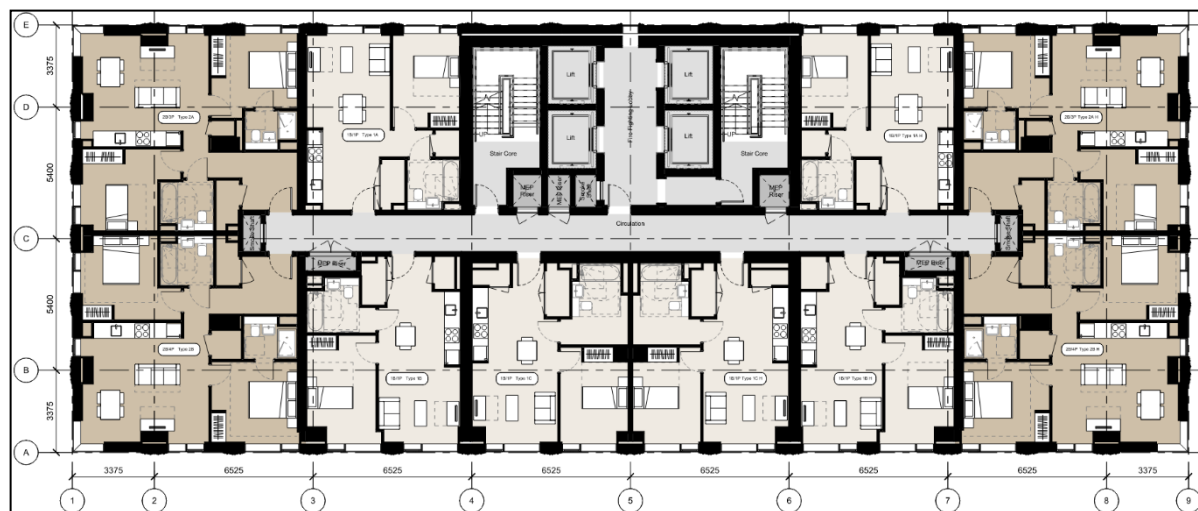


Figure 4: Typical residential floor general arrangement (levels 23-33)

2.3 Risk Profiles

The non-residential levels of the building (Ground floor, 1st floor, and 2nd floor) are to be designed in accordance with the recommendations in BS 9999. As such, it is deemed appropriate to assign a risk profile to the different areas at these levels. The risk profile is a combination of the familiarity of occupants within the premises and the potential fire hazard (growth rate) in said areas.

The relevant occupancy characteristics for the non-residential levels of the building are shown in Table 3.

The relevant occupancy characteristics to these areas of building are:

- A: Occupants who are awake and familiar with the building.

Fire growth rates are given a numerical risk rating between 1 and 4 to describe the characteristic growth rate, with the relevant growth rates being:

- 1: Slow.
- 2: Medium.
- 3: Fast.

As it is discussed in Section 4.2, the building will be provided with a BS 9251:2021 [13] residential sprinkler system throughout. BS 9999 permits a reduction in the fire growth rate where appropriate suppression is installed for an area. Hence, OFR consider it appropriate to reduce the risk profiles of areas protected with the enhanced BS 9251 system. Appropriateness of an enhanced BS 9251 Category 4 system to a BS EN 12845:2015+A1:2019 [14] will be assessed by OFR under a probabilistic fire severity analysis. Indicative risk profiles are shown in Table 3.

Table 3: Non-residential area risk profiles

Floor	Area	Risk profile ⁽¹⁾
Ground floor	Lounges/ Reception/ Comms Intake, Management room	A1
	Bin store, Generator, Substation, LV switchroom	A2
	Post room ⁽²⁾	A2
	Bike store ⁽³⁾	A2
1 st floor	Lounge, Kitchenettes,	A1
	Wet water riser, Domestic water storage, Sprinkler – Resi, Condenser compound	A1
	Life safety switch, Generator	A2
2 nd floor	Lounges, Kitchenettes, Gym, Studios	A1
Notes:		
⁽¹⁾ Fire growth rates reduced due to the provision of an enhanced BS 9251 sprinkler system.		
⁽²⁾ Risk profile is determined by the inclusion of post in this area.		
⁽³⁾ Risk profile adopted due to the potential provision of electric bikes.		

3 Preliminary Qualitative Design Review

3.1 General

A Qualitative Design review (QDR) is conducted generally when fire engineering services are provided for a 'complex' building. "Complex" residential buildings, in the opinion of OFR, are those which are not common building situations that fall within standard guidance documents such as the recommendations within BS 9991: 2015 and BS 9999: 2017 [10].

This proposed development is considered as a 'complex' building for the following reason:

- The proposed design includes building construction greater than 50 m in height – BS 9991:2015 Section 0.7 states that "the increased design demands on structural integrity, services, fire safety systems, means of firefighting and evacuation generated by buildings excess of 50 m high warrants the specific evaluation of the adopted fire safety provisions".

This Preliminary QDR provides information to support the initial conversations with project stakeholders including the approval authorities (where possible) to outline the proposed approach to support that the functional requirements of Building Regulations 2010 (as amended) are being demonstrated as being met in design.

3.2 Preliminary Review

This preliminary review mainly focuses on the impact of the building height to the structural fire performance of the building and to the protection to the vertical escape routes from the building.

3.2.1 General

A summary of the general items which impacts the building fire strategy are reviewed as a part of this preliminary QDR in Table 4, which covers a brief summary of the B1 – B5 requirements of Part B of the Regulations that governs fire safety of building design.

Table 4: Preliminary QDR considerations

Requirement	Description
B1: Means of warning and escape	The horizontal means of escape are dependent on the number of exits, exit widths and the travel distances. As these are not significantly impacted by the height of the building, the standard guidance approaches are likely to remain appropriate. The vertical escape is affected by the height of the building. Therefore, to improve the safety of the means of vertical evacuation, two protected stairs are provided, with an enhanced ventilation system including the push-pull system in the corridor and the smoke shaft in the evacuation lobby. This is an uplift compared to the limited ventilation recommendations set out for a standard two stair building in AD B. Additionally, the building is equipped with two evacuation lifts accessed through the ventilated evacuation lobby to facilitate the evacuation of mobility impaired persons.
B2 – Internal fire spread (linings)	Standard guidance recommendations for lining performance are not significantly affected by height. Therefore, the standard guidance approaches are likely to remain appropriate.
B3 – Internal fire spread (structure);	The building includes a significant amount of compartmentation and furthermore is fitted with sprinklers as the building height is over 11m. Therefore, the increase in height is not considered to lead to a detriment in the structure. Further discussion on the structural fire resistance is provided below in Section 3.2.2.
B4 – External fire spread	Due to the height and nature of the building, it is considered as a relevant building where Regulation 7 (specifically Regulation 7(2)) of the Building Regulations is applicable. Regulation 7 states that in relevant buildings the materials which become part of an external wall, or specified attachment must be of European Classification A2-s1, d0 or Class A1. Therefore, impact of the height of the building on the external fire spread is minimum.
B5 – Access and facilities for the fire and rescue service	The guidance demands only one firefighting shaft as all floors above have less than 900 m ² floor area. In this scheme, the secondary stair which is primarily used as an escape stair is enhanced to be used as a firefighting stair with the installation of wet riser outlets at each level. This is further discussed in Section 3.2.3 below.

3.2.2 Structural fire resistance

Where a building exceeds 30 m in height (measured to the topmost storey), BS 9991 and Approved Document B do not explicitly define an upper limit when recommending levels of fire resistance, with any building greater than 30 m requiring as a minimum 120-minute fire resistance period, regardless of use, size and complexity.

As building height increases, the consequence of a fire increases as the building height affects the number of persons at risk, the ease at which persons can escape, firefighting operations, and the potential increase of damage to neighbouring buildings and structure due to a potential collapse.

Due to the height of the building, this scheme would be considered under Consequence Class 3 (CC3) in accordance with Approved Document A [15] and therefore a systematic risk assessment of the building (which should also include the impact of fire on the structure) is recommended to satisfy Requirement A3 relating to disproportionate collapse. This assessment is expected to be conducted at a later stage by OFR.

To address the impact of fire on the building, the following are suggested to be undertaken:

- Estimate the minimum acceptable safety target for the building;
- Measurement of the input data for the relevant fire compartments, including geometry and ventilation openings;
- Development of a range of credible and structurally significant fire scenarios based on statistical variation in parameters informing fire development;
- Assessment of these fires to establish their impact on the temperatures achieved by the structural elements;
- Define an appropriate target fire resistance period for the structure.

All findings should be considered adequate by the approval body.

3.2.3 Stairs and lifts for evacuation and firefighting

Each of the levels within the residential areas will be accessible via two fully separated stairs. Both stairs are accessed through ventilated lobbies/ corridors at all levels. Since the floor areas of the upper floors are less than 900 m², a single firefighting shaft is required to be compliant with the guidance recommendations. One of the stairs is designed as a firefighting stair which is sited within a firefighting shaft which includes two firefighting lifts and two evacuation lifts. Access to the lifts will be always through a ventilated evacuation/ firefighting lobby at all levels in order to ensure they remain suitable for firefighting operations.

The other escape stair but it is proposed to be enhanced to a firefighting stair to allow fire service interventions as it is fitted with wet riser outlets at each level. Wet riser outlets are therefore proposed to be provided at each landing within both stairs enclosures and it is ensured that the distance to the furthestmost flat will remain under 60 m even by considering wet riser access from the floor below.

On the ground floor, each stair discharges directly to outside via protected corridors which give direct access to the fire service to enter the building and the protected stairs.

4 Summary of Fire Safety Systems

4.1 Fire Detection and Alarm System

An automatic fire detection and alarm system will be provided throughout the building as per the list below. The system should be designed and installed in accordance with the recommendations of the relevant parts of BS 5839-6:2019+A1:2020 [16] for residential areas and BS 5839-1:2017 [17] for non-residential areas.

- Flats: Category LD1 Grade D1;
- Common corridors and stairs: Category L5 (akin to L4 coverage);
- Ancillary and amenity spaces: Category L2

Additionally, it is recommended to provide visual and audible alarms on open amenity spaces such as roof and the balcony areas on the 2nd floor.

4.2 Automatic Fire Suppression System

The building is to be fitted with a sprinkler system complying to BS 9251:2021 [13], which includes non-residential spaces that do not exceed 100 m². The non-residential area of the building which have greater floor areas than 100 m², would usually be protected by a BS EN 12845:2015+A1:2019 [14] sprinkler system . The only non-residential space in the building which has a floor area greater than 100 m² is the entrance lobby. Table 3 and 4 of BS 9251 states that the foyer/reception areas are not subject to this 100 m² limits and hence, it is OFR opinion that these spaces can be served by a sprinkler system complying to BS 9251:2021 regardless of the area. However, as the building height is greater than 50 m, a probabilistic fire severity assessment will be carried out which will be utilized to demonstrate the adequacy of the approach. This will need to be reviewed and approved by all relevant stakeholders.

A fire and smoke curtain is proposed at the entrance to the evacuation/ firefighting lobby on the ground floor to have uninterrupted flow of occupants from the reception area into the lifts during building operation. The location of the fire and smoke curtain is shown in Figure 7. This fire and smoke curtain is to be designed and installed in accordance with BS 8524-1:2013 [18], BS 8524-2:2013 [19], and BS EN 16034:2014 [20].

A summary of the expected sprinkler systems can be seen in Table 5.

Table 5: Summary of sprinkler system recommendations

Area of the building	Provision of sprinkler system
Residential	Yes – Category 4 system complying to BS 9251:2021
Residential ancillary and commercial spaces (floor areas < 100 m ²)	Yes – Category 4 system complying to BS 9251:2021 ⁽¹⁾
Notes: (1) It is OFR's understanding that the corridors would be kept sterile during building operation. Therefore, following BS 9991 (section 11.1) recommendations, no sprinklers are provided in corridors.	

4.3 Smoke Ventilations System

The smoke ventilation systems employed in this scheme are described in following subsections.

4.3.1 Stairs

The stairs will be provided with an automatic opening vent (AOV) at its head and also at the ground floor level opening to the stairs with a minimum free geometric area of 1.0 m², to align with recommendations in BS 9991. This AOV will be actuated upon detection of smoke within the lobby or the corridor.

4.3.2 Evacuation/ Firefighting lobby

The 2026 Amendments to AD B recommends the provision of an evacuation lift lobby where evacuation lifts are proposed and said lobby should be afforded the same level of protection as the stair. Stairs are protected by a vent in the corridor serving the stair and the stair has an AOV (Automatic Openable Vent) at the top to provide inlet. Therefore, to ensure equivalent protection to the lobby, a smoke shaft is provided in the lobby to replicate the AOV at the head of the stair (the corridor leading to the lift lobby is ventilated to prevent smoke ingress into the lobby as it would impact the stair).

It is to be determined at the next stage whether this will be a mechanical shaft or a natural shaft.

4.3.3 Common corridors (Level 1 to 43)

In the residential floors (levels 3-43), a mechanical ventilation system will be provided within the common corridors which will consist of a push-pull system. This will consist of the two smoke shafts, one at each of the corridor as shown in Figure 5. A geometric free area of 1.2 m² for the shaft and 1 m² for the vent in the shaft are to be allowed. A computational fluid dynamics (CFD) analysis will need to be undertaken at the next design stage to validate the proposed design and determine the required extract rates for the system.

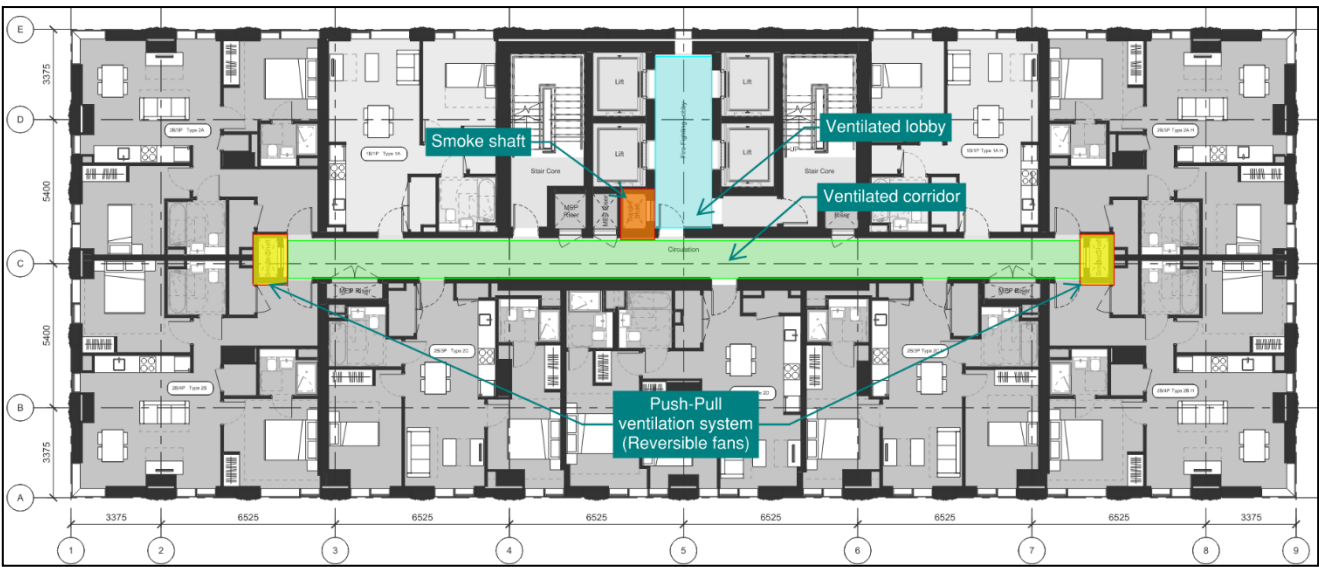


Figure 5: Ventilation system arrangement on the residential floors (levels 3-43)

The 1st and 2nd floors of the building which consist of ancillary and residential amenity areas, are equipped with two smoke shafts located either side of the stair core which are recommended to have reversible fans. At each location, the shafts are connected across the floors. Floors 01 and 02 will be provided a push-pull ventilation system as shown in Figure 6.

4.3.4 Ground Floor

The smoke shafts from the floors above ground are to be extended to ground floor to facilitate ventilation for the stair lobbies. The ventilation systems and lobbies are highlighted in Figure 7. It is also recommended that an AOV should be provided to the lift lobby at ground floor (also shown in Figure 7). It is noted that both stairs have protected lobbies that are accessed from the reception.

Guidance recommends having a minimum of 0.2 m² permanent ventilation to a protected lobby connected to the bin store or suitable mechanical alternative. It is to be noted that if the bin store door into the circulation space can be removed and it only has direct discharge to outside, several additional space and ventilation requirements regarding the bin store can be avoided.

4.4 Emergency Lighting

Escape routes within the building should be provided with effective lighting to allow persons to safely use these routes in the event of a fire occurring or in the event of failure of the normal lighting power supply. Emergency lighting should be installed in accordance with BS 5266-1:2016 [21].

4.5 Emergency Power

Emergency power supplies are necessary for all active fire safety systems, including the following:

- Fire detection and alarm system;
- Emergency lighting and exit signage;
- Smoke control systems (fans, control equipment and vents);
- Firefighting provisions;
- Automatic fire suppression system;
- Evacuation Lifts.
- Wet riser mains
- Fire and smoke curtains

If the primary power source fails, then the power supply should be automatically switched over to a secondary power source. Failure of or damage to one of the power sources should not cause the failure of the other power source or the failure of the supply of power to the system. All power and control cabling should comply with the relevant recommendations of BS 8519:2020 [22] and Section 15 of BS 9991. The current proposal for emergency power supply is for a generator, which is located on the ground floor.

4.6 Evacuation Alert Systems

As the building has a top storey over 18 m above ground level, an evacuation alert system should be provided in accordance with BS 8629:2019 [23].

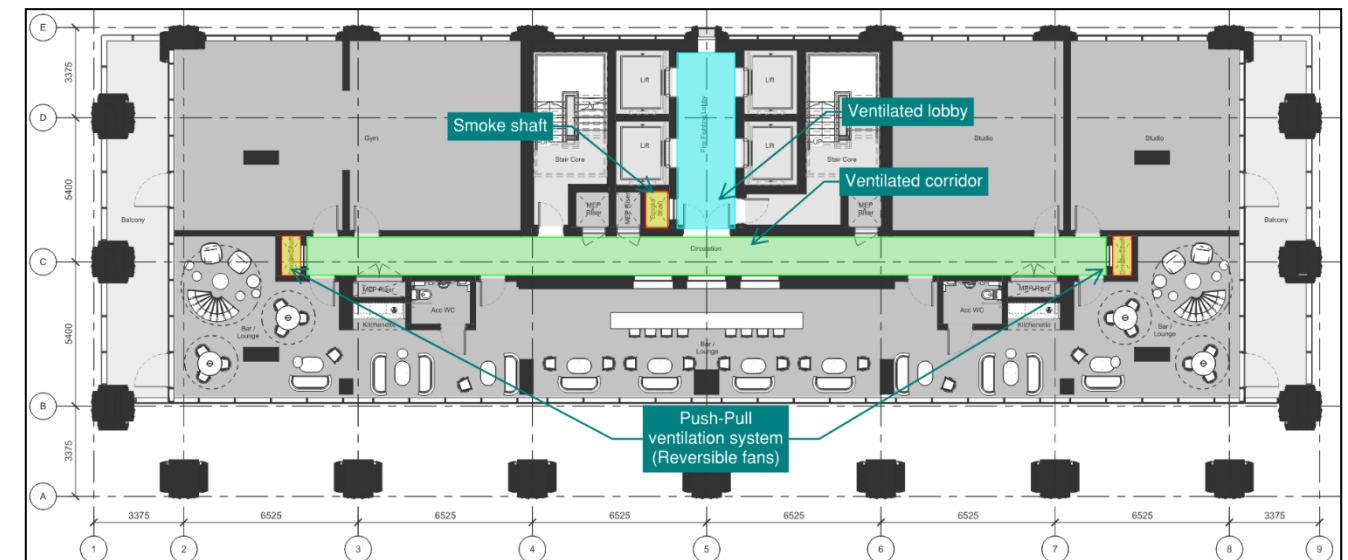


Figure 6: Ventilation system arrangement on the 2nd floor

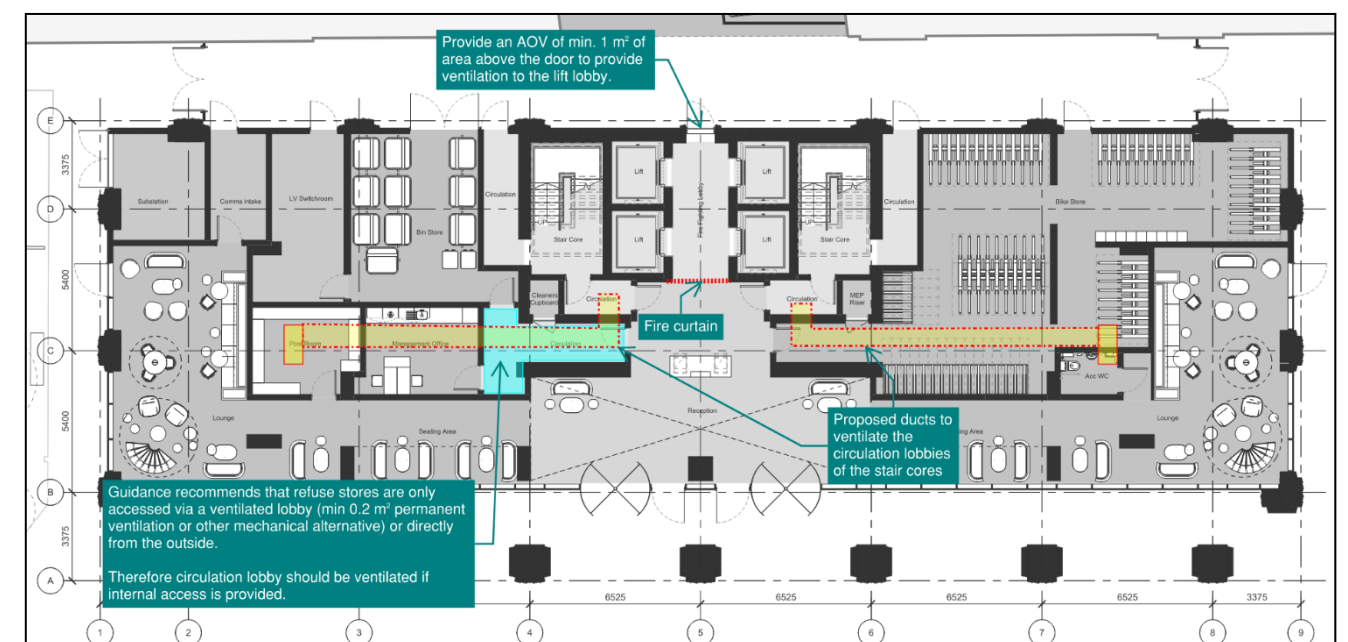


Figure 7: Ventilation system arrangement on the ground floor

5 Means of Warning and Escape

The following section outlines the key principles with regards to means of escape.

5.1 Evacuation strategy

The residential units in the buildings will operate what is referred to as a “safe to stay, safe to leave” evacuation strategy. There is no specific difference between this strategy and a “stay put” strategy as the approach set out in BS 9991 is sometimes referred to. However, the term “stay put” can be confusing as it implies all occupants other than those in the residential unit of fire origin remaining in place. The actual strategy envisaged in the standard guidance is that:

- Only the occupants from the flat of fire origin should need to evacuate initially;
- All other occupants should be safe to remain safely in place;
- If further occupants decide to leave or need to leave because they become affected by heat or smoke, they can;
- If the fire and rescue service consider wider evacuation is required, then this can be accommodated.

5.2 Horizontal Means of Escape

5.2.1 Flats

The total travel distance from any point within the flat to the entrance door of the flat should be limited to 20 m as the residential areas of buildings will be provided with an automatic water fire suppression system (AWFSS) and an LD1 fire detection and fire alarm system in accordance with BS 5839-6:2019+A1:2020. As shown in Figure 8, the travel distances within the flats are less than 20 m limit, in compliance with the guidance recommendations.

5.2.1.1 Open Plan Unenclosed Kitchens

BS 9991 recommends that the kitchen should be enclosed where the size of the apartment exceeds 8 m by 4 m. Applying this recommendation to the layouts of these apartments is expected to be impracticable and OFR would consider that provided the cooker is sufficiently away from the escape route, the risk will be tolerable. Further assessment and analysis can be provided at the next stage of the design if required by the approval authorities.

As the kitchen areas in these flats will not be enclosed as per BS 9991 recommendations, is OFR’s recommendation that all flat cooking hobs should be positioned such that occupants are not required to escape within 1.5m of the hob (at a distance measured from the cooking appliance) and also maintain the escape route width of 0.8 m. This is currently understood to be met for all proposed flats in the scheme as seen in Figure 8. An analysis can be provided at the next design stage to validate this distance as adequate to keep the means of escape as tenable.

5.2.2 Common Corridors

BS 9991 recommends that the escape routes should be designed in accordance with the recommendations shown in Figure 9 (Figure 7 in BS 9991).

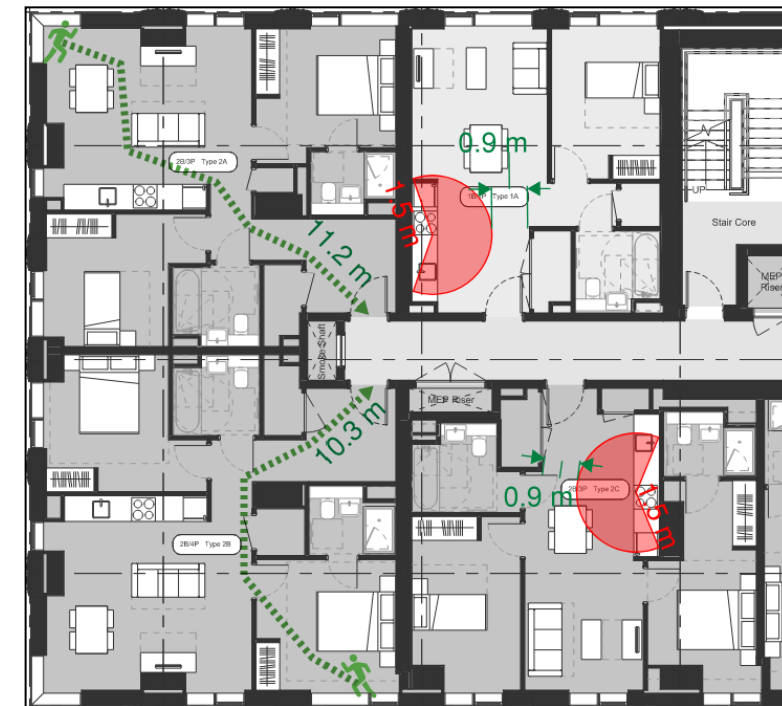


Figure 8: Open plan unenclosed kitchen layout and travel distance within flats

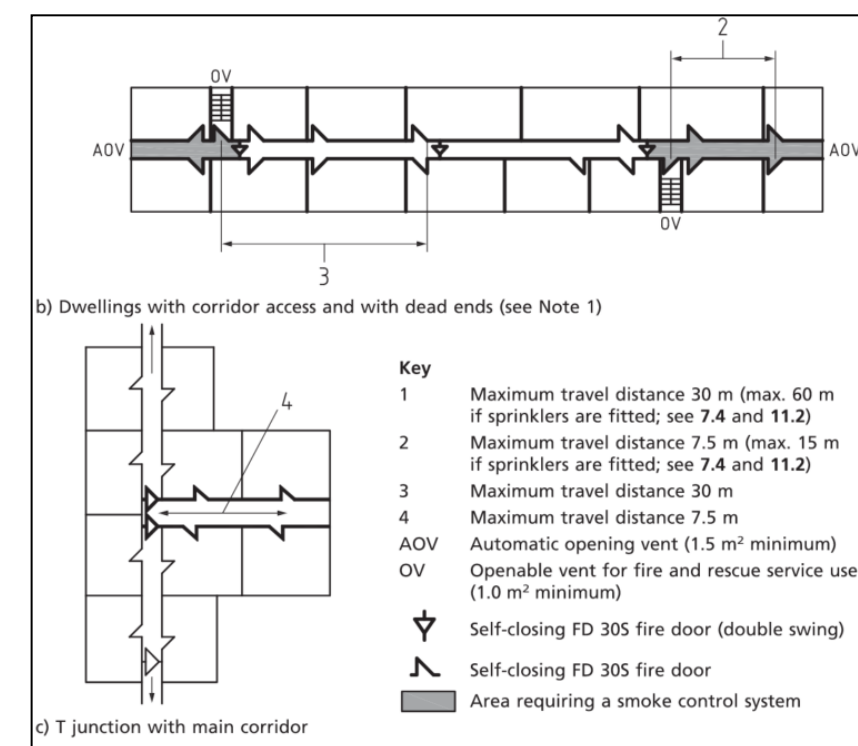


Figure 9: Recommended escape route provisions in multi stair buildings (Figure 7 – BS 9991)

The design of the residential floors of the building meets with the recommendations of BS 9991 as it ensures that the distances between any of the apartment's access door to the evacuation stair will be less than 15 m (see Figure 14). Whilst BS 9991:2015 recommends that dead-end corridors are separated with a self-closing FD30S fire doorset, the layout is considered acceptable as a push-pull mechanical smoke ventilation system is provided through the entire corridor length. The push-pull ventilation system with reversible fans at each shaft at corridor ends will keep the common corridor tenable during the escape phase.

5.2.3 Residential Amenity Spaces

In the current design, while most of the travel distances are complying to the limits outlined in BS 9999, there are a few amenity areas on the first three levels of the buildings, from where the direct travel distances to the stair enclosures are exceeding the recommended limits.

As all these spaces are considered to be residential amenity spaces where people are awake and familiar with the layout and equipped with sprinkler protection, a risk profile of A1 is considered suitable for these areas. Based on an A1 risk profile, BS 9999 recommends one-way travel distances of 26 m (actual travel distance) and 17 m (direct travel distance) when the internal layout is known and unknown, respectively. Since the furniture and internal layouts are not provided at this stage, 17 m one-way travel distance limit is considered for most cases. Where travel distances exceed 17 m of direct travel, it should be ensured that the final internal layout should be within 26 m to an exit.

Figure 10 to Figure 14 highlight indicative travel distances on each floor and demonstrate the meet the recommendations in BS 9999. Where the room layout is currently unknown, it should be ensured that these travel distance limits are met during the next design stage.

The potential increments to the travel distance limits due to the introduction of an enhanced detection and alarm system can be addressed in the next stages.

There is a central void next to the front elevation of the building which runs across the first two floors (Ground floor and 1st floor). It is recommended that this void should be enclosed with 120 minutes including the glazing proposed around the void. Alternative solutions to reduce the fire resistance can be developed at the next stage.

5.3 Final Exits

Protected stairways should discharge either:

- Directly to a final exit; or
- Into a protected corridor leading to a final exit which is itself lobbied from any accommodation.

The protected corridors leading to the final exit should have the same standard of fire-resistance and lobby protection as the stairway it serves.

In the proposed layout for the ground floor, there are final exits planned for two stair enclosures via a protected corridor and a direct exit from the lift lobby for people evacuating via the evacuation lifts. All these discharge routes are lobby protected. The final exits are highlighted in green arrows in Figure 11.

5.4 Evacuation of Mobility Impaired Persons (MIPs)

The accessible means of escape needs to form an integral part of the design and be incorporated into the fire safety strategy. No reliance will be made on the fire service to assist in the evacuation of mobility impaired

occupants; Therefore, two of the proposed lifts which are accessed via the evacuation/firefighting lobby are to be designed as lifts to be suitable for use during an evacuation (shown in Figure 15). The 2026 amendments to AD B v1 outline new recommendations regarding evacuation lift lobbies which states that it should provide a refuge area for those waiting for the evacuation lift, have direct access to a protected stairway and not be directly accessible from any flat, maisonette, storage room or electrical equipment room.

It should be ensured that the lifts will remain operational during an event of fire unless the access corridors and the lobby are compromised with smoke, forming untenable conditions. The lifts should not be designed to immediately ground after the activation of smoke detectors as the conditions inside the corridor can still be tenable for occupants to evacuate as they are equipped with mechanical ventilation systems to extract smoke.

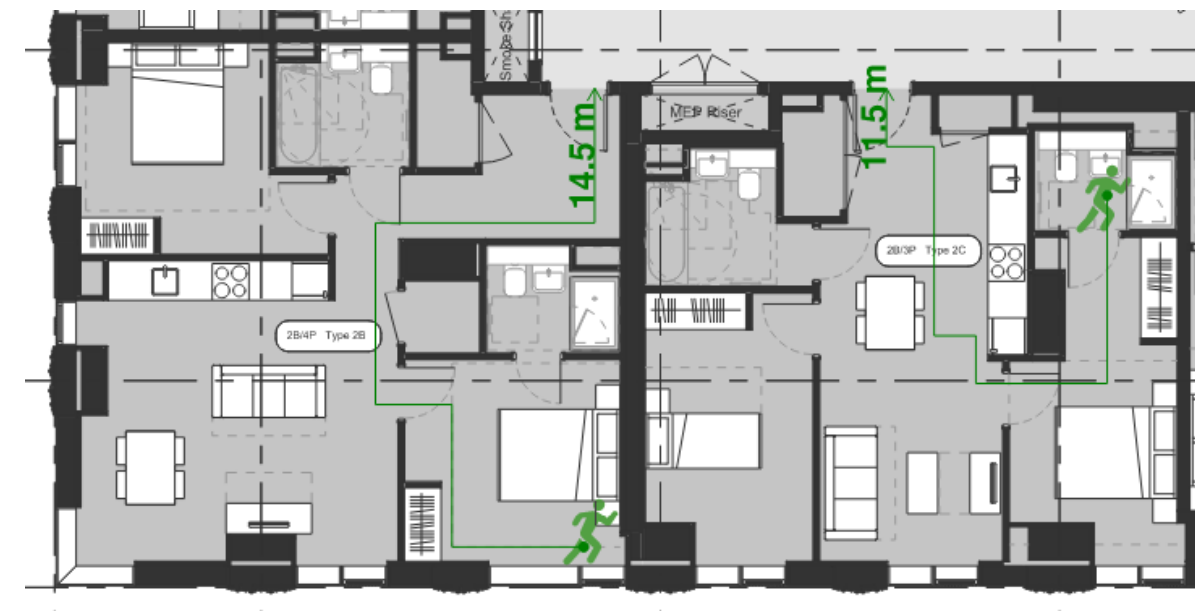


Figure 10: Typical flats arrangement and travel distances within the flat

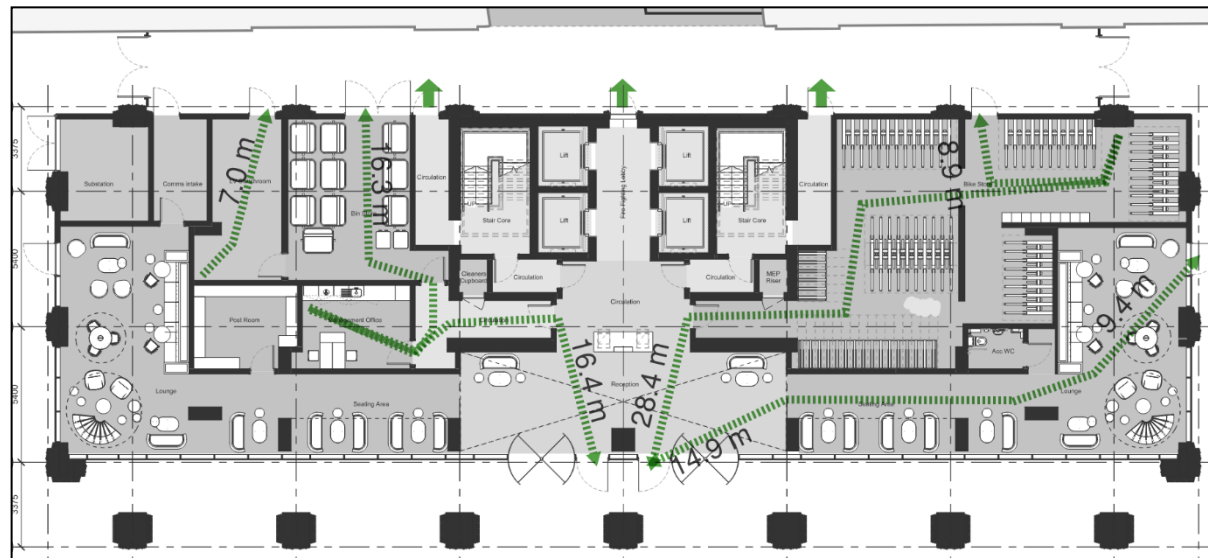


Figure 11: Final exits and indicative alternative travel distance mark-ups on the ground floor

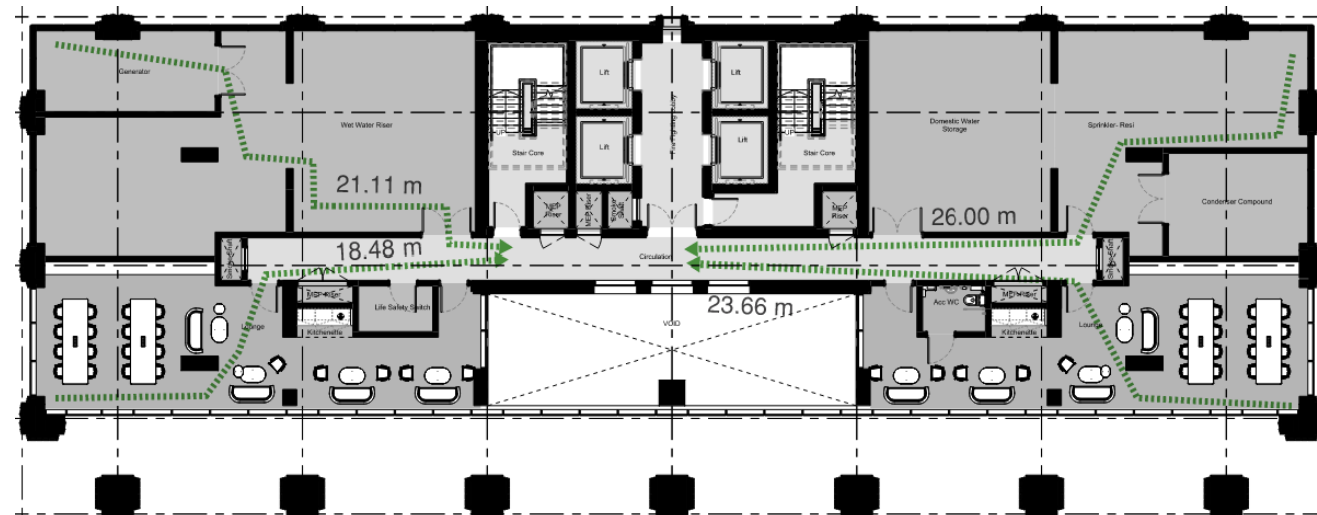


Figure 12: Travel distance mark-up on the 1st floor

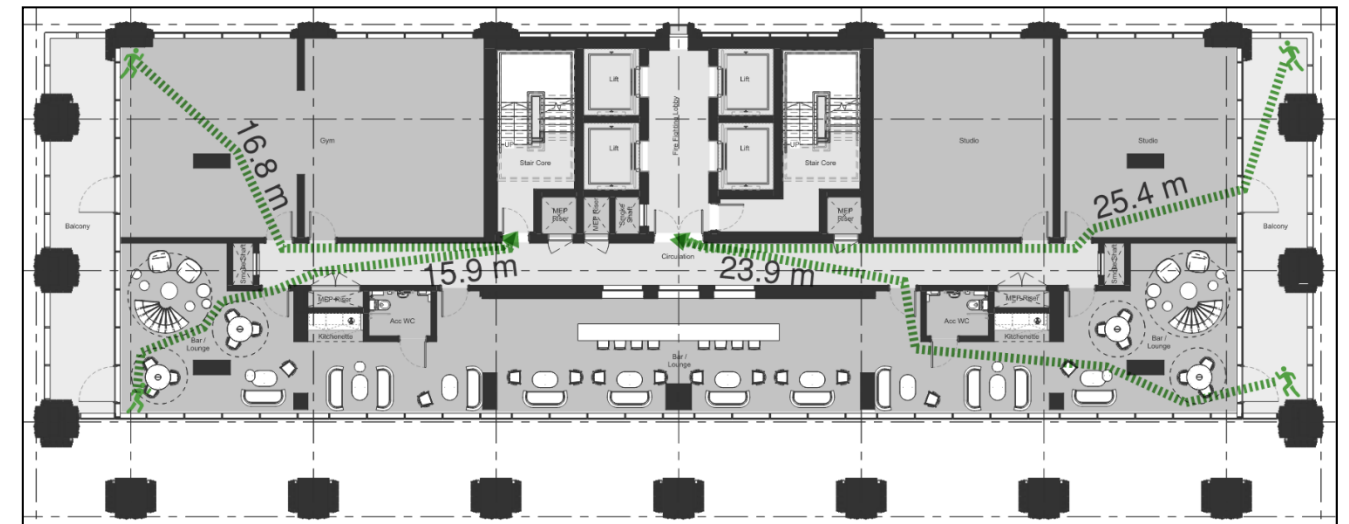


Figure 13: Travel distance mark-up on the 2nd floor



Figure 14: Travel distance mark-up on a typical residential floor

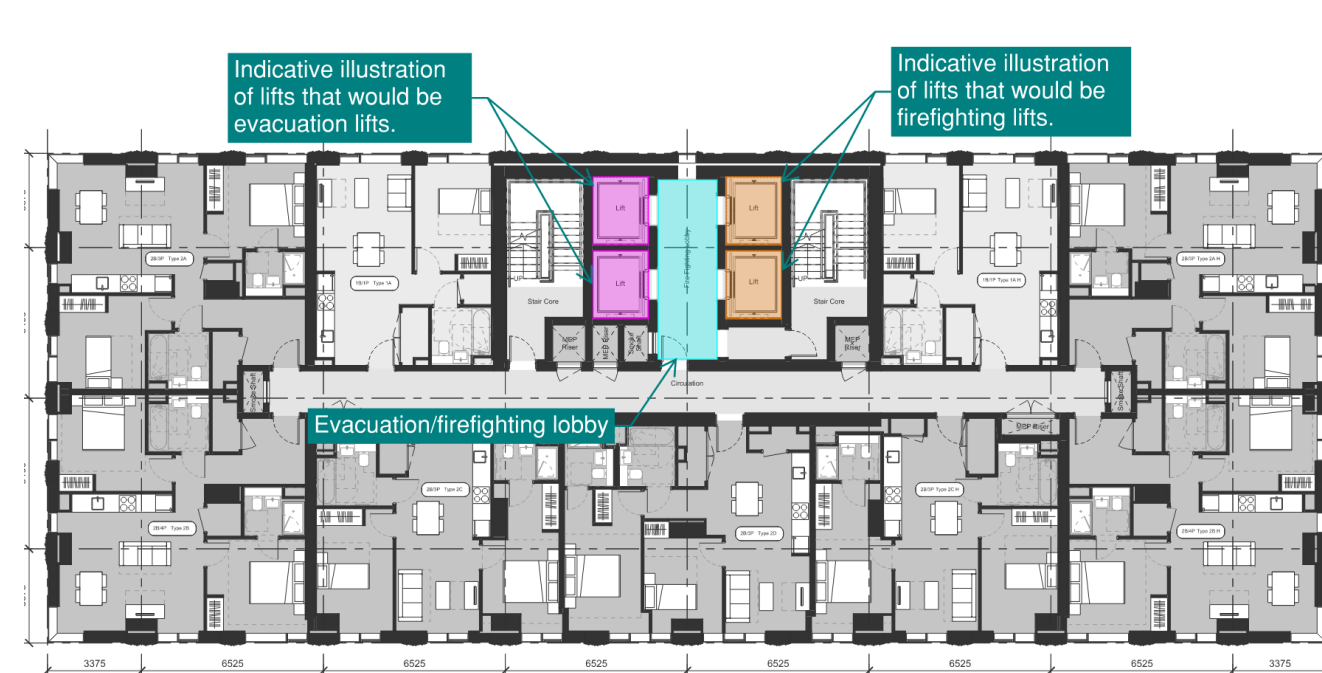


Figure 15: Illustration of locations of evacuation and firefighting lifts accessed from the firefighting lobby

6 Internal Spread of Fire

6.1 Linings

All wall and ceiling linings in the building is to meet the recommendations of BS 9991:2015 in residential areas and BS 9999:2017 in non-residential/amenity areas. The recommendations of both are summarised in Table 6.

Table 6: Classification of linings

Location	European Class ⁽¹⁾
Small rooms of area not more than: 4 m² in residential accommodation 30 m² in non-residential accommodation	D-s3, d2
Other rooms ⁽²⁾	C-s3, d2
Circulation spaces within dwellings	
Other circulation spaces (including the common areas of the building)	B-s3, d2
Notes: (1) When classified in accordance with BS EN 13501-1:2018 [24]. (2) Parts of walls in rooms may be of European Class D-s3, d2 provided that the total area of those parts in any one room does not exceed one half of the floor area of the room, subject to a maximum of 20 m² in residential accommodation, and 60 m² in non-residential accommodation.	

6.2 Structural Fire Protection

As the height of this building to the top occupied storey is over 30 m, as per guidance the building should have as a minimum 120-minute structural fire resistance.

With the building height being in excess of 50m, the characteristics of this building are beyond the remit of the direct applications of BS 9991:2015. In addition, as the height of the building is more than 15 storeys, it is designated as a Consequence Class 3 (CC3) building as per Approved Document A. For CC3 buildings, the adequate performance of the structure should be demonstrated by a systematic risk assessment which is to be developed at the next design stage, considering the impact of fire on the structure of the building. The structural fire engineering assessment should also consider the different residential and non-residential areas and the associated likelihood of fires occurring and their potential to impact the structure.

The fire resistance periods of the main building elements are provided in Table 7. Common to all the provisions of Part B of the Building Regulations is the property of fire resistance. Fire resistance is a measure of one or more of the following:

- Loadbearing capacity (R) – resistance to collapse, which applies to loadbearing elements only;
- Integrity (E) – resistance to fire penetration; and
- Insulation (I) – resistance to the transfer of excessive heat.

6.3 Compartmentation and Fire Resisting Construction

Table 7 details all of the compartmentation requirements for this proposed scheme. This information is based on the compartmentation guidance provided in BS 9991:2015 and BS 9999: 2017. Based on the height, area and occupancy characteristics of the buildings; every floor should be designed as a compartment floor.

It is to be noted that the compartmentation is breached due to the presence of an open void in the first three floors (from ground floor to 2nd floor). Therefore, it is recommended to enclose the void with 120 min fire resistance including the proposed glazing around the void. Alternative solutions to reduce the extent of fire resistance can be developed at the next stage.

Compartment walls will be provided as follows and should match the fire resistance period of the structure which is 120 mins for this building (except where stated):

- Every wall separating flat from the remainder of the building;
- Walls separating the communal and ancillary spaces from the remainder of the building;
- Walls enclosing protected shafts, including firefighting/ evacuation stairs, lifts, and service risers;
- Walls enclosing refuse storage rooms; and
- Walls enclosing plant rooms.

All compartment walls will form a complete barrier between the compartments they separate and run the full storey height. At the junction of a compartment wall and internal non-fire resisting cavity wall, a cavity barrier will be provided to maintain the integrity of the junction. This cavity barrier will achieve not less than 30 minutes fire resistance (integrity) and 15 minutes (insulation).

The compartment walls will be designed to resist the deflection of the floor above; either by having a suitable head detail between the wall and floor; or can resist the additional vertical loads from the floor as it deflects. Where a compartment wall meets the underside of the roof, the wall will be taken to the underside of the deck or roof covering and suitably fire stopped.

6.4 Fire Doors

Fire doors are to be provided as per Table 7. Fire doors penetrating a fire rated partition should be provided in accordance with BS 476-22:1987 [25] and provided with smoke seals (where specified) in accordance with BS 476-31.1:1983 [26]. All fire doors will be fitted with self-closers except for fire doors to cupboards and service risers, which are to be kept locked shut.

Where a self-closing device is considered of hindrance to the normal use of the building, automatic hold-open devices linked to the fire detection and alarm system in accordance with BS 7273-4 [27] may be provided.

6.5 Fire and Smoke Curtains

Where fire and smoke curtains are used on the scheme (Section 4.2), they should be designed and installed in accordance with BS 8524-1:2013 [18], BS 8524-2:2013 [19], and BS EN 16034:2014 [20]. The curtains will be fitted with smoke seals installed in accordance with BS EN 1634-3:2004 [28].

The recommended performance of the fire and smoke curtain provided at the ground floor is a '120 ES' specification. The following definitions apply:

- E - Integrity performance
- EW - Radiation (heat flux)
- S - Smoke containment

Table 7: Fire resistance of elements

Element	Minimum Fire Resistance rating (minutes) ⁽¹⁾	Minimum Fire Resistance Fire Doorset
Loadbearing Elements	120 R	N/A
Compartment Walls	120 REI	FD 120S
Compartment Floors	120 REI	N/A
External Wall (space separation)	Refer to Table 9	
Firefighting shaft	120 REI	FD 60S
Lift shafts	60 REI	FD 30
Escape stair with wet riser outlets	120 REI	FD 60S
Flat Enclosures	60 REI	FD 30S
Protected Lobbies	30 REI	FD 30S
Generator/ Substation	120 REI ⁽²⁾	FD 60
LV switchroom	30 REI	FD 30
Bike store	30 REI	FD 30
Post room	30 REI	FD 30
Bin store	120 REI	FD 120S
Sprinkler tank rooms	120 REI	FD 60S
Wet riser tank/ pump rooms	120 REI	FD 60S
Storage areas greater than 1 m ²	30 REI	FD 30
Plant rooms	60 REI ⁽³⁾	FD 30S
Cavity Barrier	30 E & 15 I	FD 30
Note: (1) The 'R' rating only applies to elements that are loadbearing. (2) The substation may require 240 min fire resistance depending on its content. Confirmation from the electricity provider is pending. (3) Fire resistance of the plant rooms might be subjected to change upon the confirmation of its contents.		

6.6 Cavity Barriers

Cavity barriers should be provided to close cavities, as per section 19.1 of BS 9991.

8 External Spread of Fire

8.1 External wall construction

Regulation 7 (specifically Regulation 7(2)) of the Building Regulations specifies that for **relevant buildings**, meaning ‘any building with a storey at least 18m above ground level which contains one or more dwellings, and institution, or a room for residential purposes’, the materials which become part of an external wall, or specified attachment must be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1:2018 [24].

Regulation 7(3) sets out some exceptions from the requirements in Requirement 7(2).

Whilst regulation 7(3) states that the requirements do not apply to membranes, the revised statutory guidance (AD B) recommends that membranes used as part of the external wall construction should achieve a minimum classification of European Class B-s3, d0. Roofing membranes do not need to achieve a minimum of Class A2-s1, d0 when used as part of a roof connecting to an external wall.

Thermal breaks should not span two compartments and should be limited in size to the minimum required to restrict the thermal bridging (the principal insulation layer is not regarded as a thermal break).

As best practice, it is recommended by the ASFP Advisory Note 7 [29], that horizontal linear gap seals used in association with curtain walls are only tested to BS EN 1364-4 [30] and that test evidence obtained using BS EN 1366-4 should not be used to support that end-use application.

Additionally, it is recommended that all practical endeavours should be applied to seek the best performing materials (subject to other performances being satisfactory).

8.2 Roof coverings

Roof coverings should be designated in accordance with Table 8. The relevant boundary for roof coverings is the same as that for space separation.

Performance of the resistance of roofs to external fire exposure is measured in terms of penetration through the roof construction and the spread of flame over its surface. Roof covering designations are derived in accordance with the means detailed in BS EN 13501-5 [31].

Due to the proximity of the building to the site boundary and the building height; it is recommended that the roof coverings for the building achieve $B_{ROOF}(t_4)$.

Table 8: Roof covering designations

Distance from the relevant boundary	Permissible roof covering designations
Less than 6 m	$B_{ROOF}(t_4)$
At least 6 m	$B_{ROOF}(t_4)$ or $C_{ROOF}(t_4)$
More than 20 m	$B_{ROOF}(t_4)$, $C_{ROOF}(t_4)$, $D_{ROOF}(t_4)$ or $E_{ROOF}(t_4)$

8.3 Space Separation Assessment

A preliminary space separation assessment carried out in accordance with BR 187 [32] has been conducted, in order to determine the requisite quantity of fire rated external wall construction to mitigate the risk of fire spread across relevant boundaries. This assessment is subject to future plan revisions and will be updated in next stages.

The following assumptions have been made for these calculations:

- Each area has been measured as an equivalent rectangle;
- The fire has been assumed to compromise the entirety of a compartment;
- The fire will be restricted to a single level due to the compartment floors;
- The relevant boundaries on all elevations have been measured to the centreline of the adjacent roadways or buildings as shown below in Table 9, and Figure 16 to Figure 19;
- Where an external wall is more than 1000mm from the relevant boundary, the extent of unprotected areas should not exceed the recommendations in Table 9. The rest of the wall should achieve 120 minutes fire resisting construction (integrity and insulation) tested from the inside of the building only.

Where the external walls are located more than 1000mm from the relevant boundary, it should be tested from both sides per the above. In this scheme, all external walls are situated more than 1000 mm from the relevant boundary under the current layouts.

Table 9: External fire spread allowable unprotected area %

Room	Elevation	Heat Flux (kW/m ²)	Relevant Boundary	Boundary Distance (m) ⁽¹⁾	Enclosing Rectangle (W x H) (m)	Allowable Unprotected Area (%) ⁽²⁾
Ground Floor						
Bicycle store	1	84	Arches ⁽³⁾	1.5	14.1 x 4.55	100.0
Bin store	2	168	Arches ⁽³⁾	1.5	4.9 x 4.55	34.4
LV Switchroom	3	168	Arches ⁽³⁾	1.5	2.8 x 4.55	50.1
Comms intake	4	168	Arches ⁽³⁾	1.5	2.3 x 4.55	58.9
Substation	5	168	Arches ⁽³⁾	1.5	3.7 x 4.55	40.8
Lounge	6	84	Half point to Cameron Street	7.0	9.2 x 4.55	100.0
Lounge/ Reception	7	84	Half point to Deansgate-Castlefield ⁽⁴⁾	18.9	44.8 x 9.1 ⁽⁵⁾	100.0
Lounge	8	84	Half point to Bugle Street	7.0	9.2 x 4.55	100.0
1st Floor						
Sprinkler-Resi	9	84	Arches ⁽³⁾	1.5	15.6 x 4.55	50.9
Wet water riser	10	84	Arches ⁽³⁾	1.5	9.0 x 4.55	54.8
Generator	11	84	Arches ⁽³⁾	1.5	6.3 x 4.55	30.6
2nd Floor						
Studio	12	84	Arches ⁽³⁾	1.5	6.3 x 4.55	61.2
Gym	13	84	Arches ⁽³⁾	1.5	12.9 x 4.55	51.7
Typical Residential Floor						
Type 2A Flat	14	84	Half point to train track ⁽⁶⁾	9.0	8.9 x 2.93	100.0

Notes:

(1) Preliminary estimated measurements at this stage of the design development.

(2) Allowable unprotected area has been doubled on account of sprinkler protection.

(3) Distance accounts for a potential tenanted use under the arches of the train station. The distance may be extended to halfway to the train tracks if these spaces will not be in use.

(4) Distance is measured as halfway distance to the arch stores under the Deansgate-Castlefield tram station. Measurements were taken using the Site Plan drawing provided.

(5) Total height up to and containing the 2nd floor level is considered as the first two levels are connected by a void. Entire section is considered as one compartment.

(6) Above 10 m height, it is considered that the relevant distance can be taken as halfway to the train tracks.

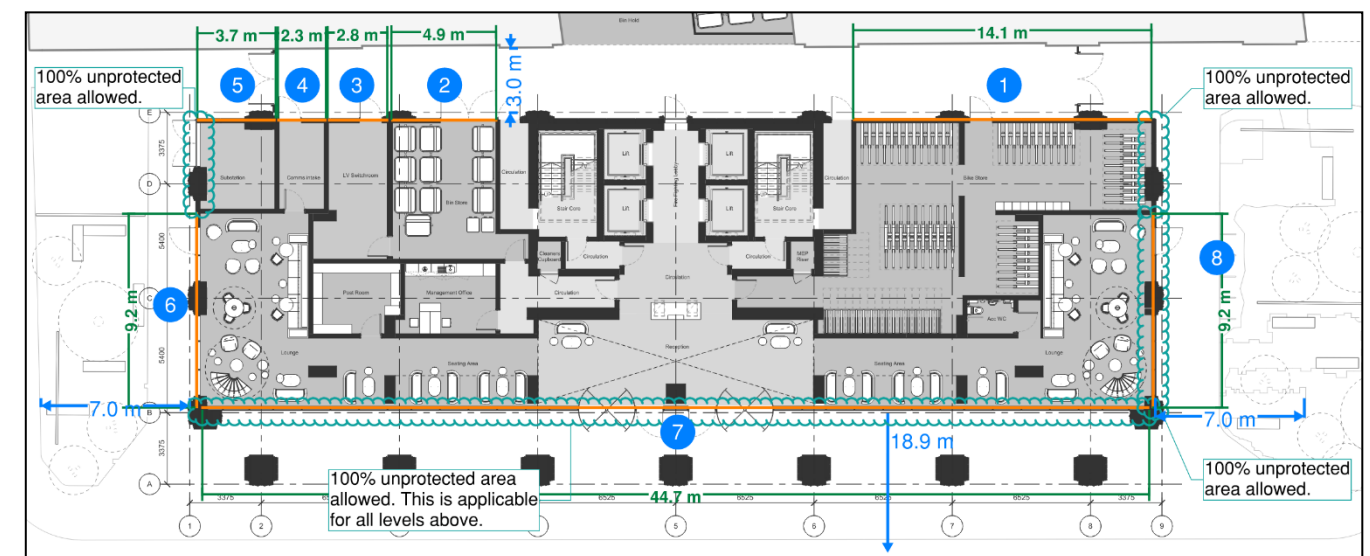


Figure 16: Space separation measurements for ground floor layout

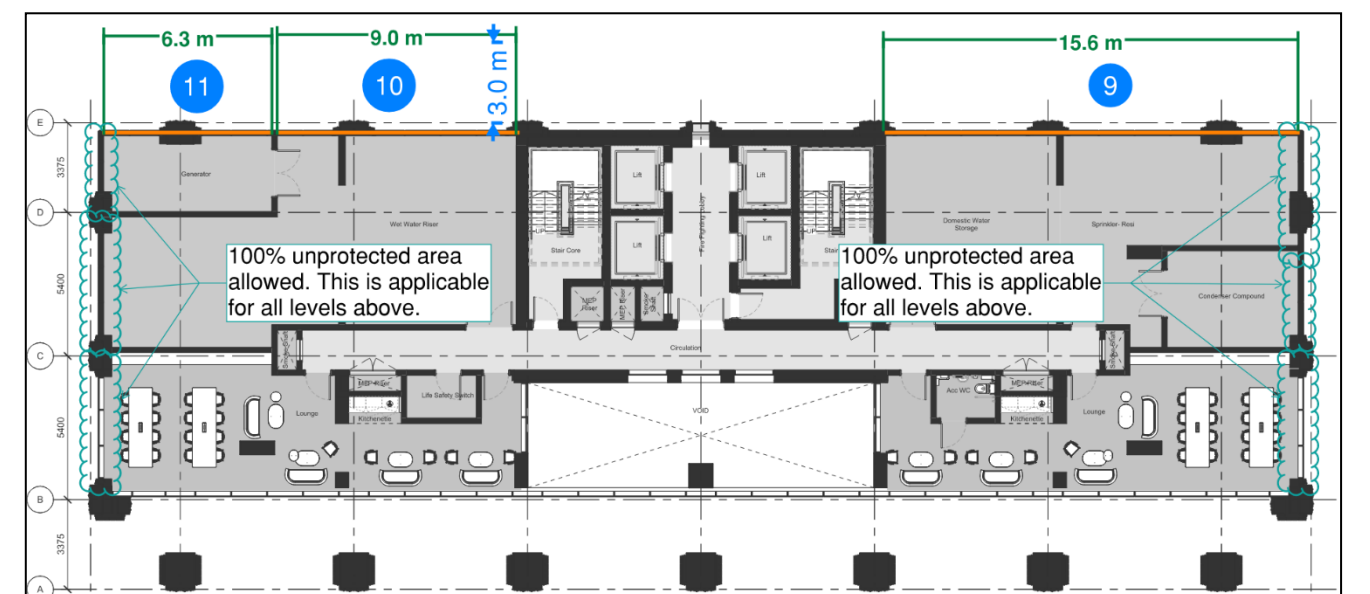


Figure 17: Space separation measurements for 1st floor layout

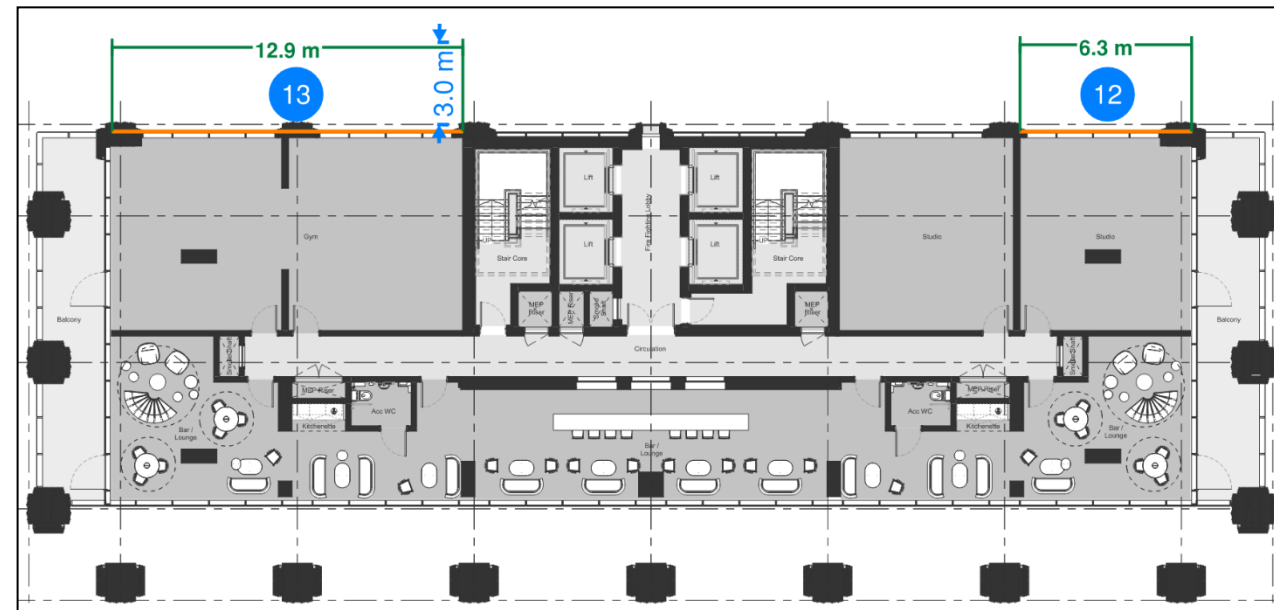


Figure 18: Space separation measurements for 2nd floor layout

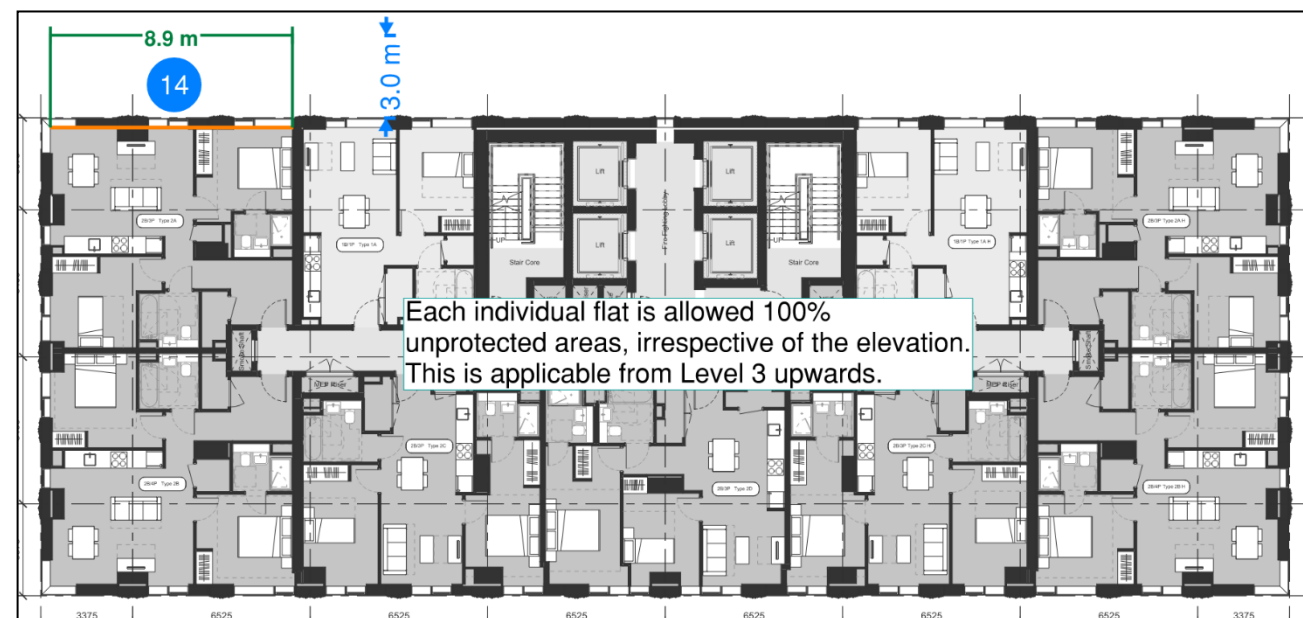


Figure 19: Space separation measurements for typical residential floor layout

9 Access and Facilities for the Fire & Rescue Service

9.1 Internal Firefighting Facilities

As the building height is more than 18 m above the fire service access level and maximum floor area of a floor plate on an upper level is less than 900 m², BS 9991 recommends the building is provided with a firefighting shaft with a firefighting lift. It also recommends the building to be fitted with wet fire mains as the building height is more than 50 m. The wet riser mains to be designed in accordance with BS 9990:2015 [33] and firefighting lifts to be installed in accordance with BS EN 81-72:2020 [34]. The firefighting stair need to have a minimum stair width of 1100 mm.

Above recommendations are met by the current design which provides a firefighting shaft that includes a firefighting stair, firefighting lifts, firefighting/ evacuation lobby and a wet fire main. Due to the building being over 50 m in height, as an enhancement, the secondary stair may be provided with a wet main to increase robustness of the firefighting provisions. Additionally, a second firefighting lift is also provided inside the firefighting shaft for this scheme. These enhancements will be assessed through the QDR process at the next design stage.

9.2 External Firefighting Facilities

The fire service access to the site is primarily via Whitworth Street. The fire service will be needing access the rear side of the building during firefighting operations to access the building and also to connect the pumping appliances to wet riser inlets and sprinkler tank refill inlets. Even though the roads adjacent on both left and right side of the building gives access to the rear side, it is recommended to use Cameron Street, which is at the left of the building, as shown in Figure 20, to be used as the primary access road for the fire service. A potential secondary access road can be provided through Bugle Street.

To avoid separate fire appliances to be sent around the building, it is advised to provide the wet riser inlet points and sprinkler refill points at the same location, close to the fire service access. The design team needs to ensure availability and accessibility of the streets for the fire service during building operational time. The fire appliance access route should, as a minimum, comply with Table 10, however fire appliances are not standardised in the UK. Therefore, the figures provided in Table 10 should be confirmed by the local Fire and Rescue Service. The external firefighting provisions are highlighted in Figure 20.

BS 9991 states that for the multi-storey buildings fitted with wet fire mains, fire appliance should have access:

- a) within 18 m of, and within sight of, a suitable entrance giving access to the wet fire main; and
- b) within sight of the inlet for the emergency replenishment of the suction tank for the wet fire main.

It is understood that the proposed locations for the wet riser and sprinkler refill inlets are most likely to be within sight of the fire appliance parking locations. Moreover, the fire service can access the stairs and lifts through the main entrance from within 18 m of the parking position on Whitworth Street. This would be considered as a slight deviation from the guidance recommendation that needs to be agreed with the fire service. However, since the current layouts do not confirm the parking locations for the fire appliances, a full final site plan will be needed to assess this.

A public external hydrant is located approximately 50m from the proposed building. This hydrant is located at the intersection of Albion Street and Whitworth Street. The location and the operational status of this hydrant

is to be confirmed by the Fire Service. If existing hydrant provisions do not align with BS 9991 recommendations, additional hydrant (s) will be provided within 90m of the fire main infill inlet to meet BS 9991 recommendations.

Table 10: Pump-type firefighting appliance access route specifications

Minimum access route specification	Dimension
Width between kerbs (m)	3.7
Width between gateways (m)	3.1
Turning circle between kerbs (m)	16.8
Turning circle between walls (m)	19.2
Clearance height (m)	3.7
Carrying capacity (tonnes)	12.5

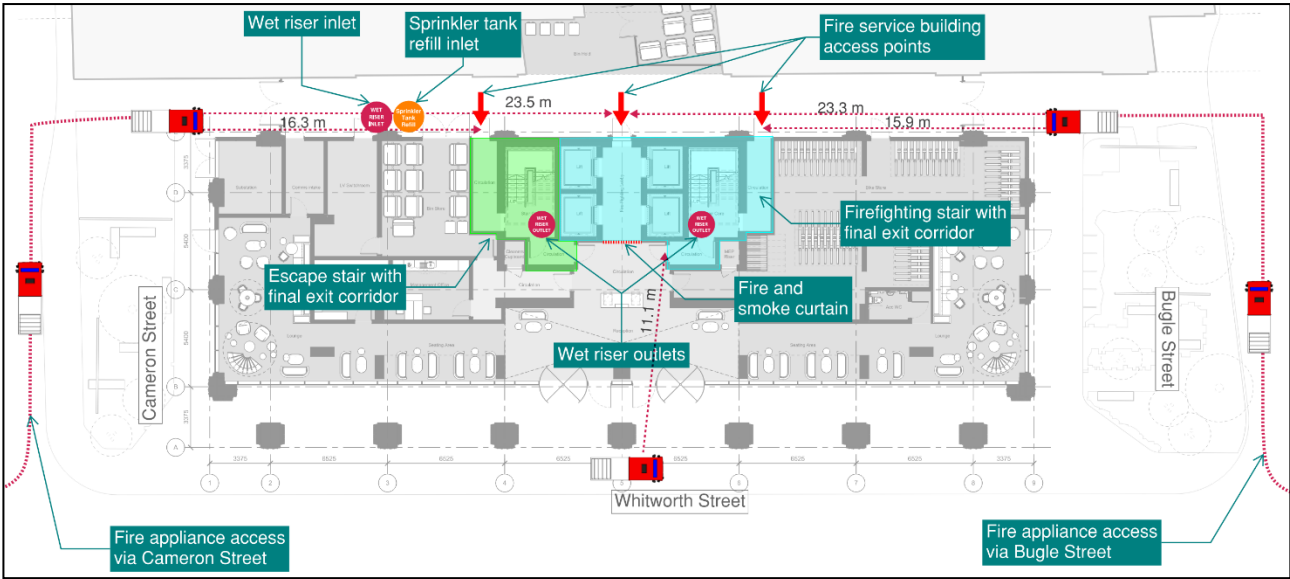


Figure 20: FRS access roads and building access points

9.3 Other Firefighting Provisions

9.3.1 Wayfinding Signage for the Fire Service

Signage identifying floors and flats will be provided for firefighters. These will meet the following conditions:

- The signs should be located on every landing of a protected stairway and every protected corridor / lobby into which a firefighting lift opens;
- The text should be in sans serif typeface with a letter height of at least 50 mm. The height of the numeral that designates the floor number should be at least 75 mm;
- 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;
- The signs should be mounted between 1.7 m and 2.0 m above floor level and, as far as practicable, all the signs should be mounted at the same height; and
- The text should be on a contrasting background, easily legible and readable in low-level lighting conditions or when illuminated with a torch.

The wording used on each floor identification sign should take the form 'Floor X', with X designating the number of the storey, with 'Floor 0' being the Ground floor. Floor signs should also be supplemented with flat indicator signs which provide information relating to flats accessed at each storey. The wording of the signs should take the form of 'Flats X – Y'; be in sans serif typeface with the letter heights at least half the height of the floor indicator signs. Arrows should be used to indicate directions of the flats when more than one direction.

9.3.2 Secure Information Boxes

A secure information box provides a secure facility to store information about a building for use by the fire and rescue service during an incident. As the building has a top storey height more than 11 m above ground level, the building should be provided with a secure information box. The box should meet all of the following conditions:

- Sized to accommodate all necessary information;
- Easily located and identified by firefighters;
- Secured to resist unauthorised access but readily accessible by firefighters;
- Protected from the weather.

Best practice guidance for the adoption of these secure information boxes is contained within Sections 2 to 4 of the 'Code of Practice for the Provision of Premises Information Boxes in Residential Buildings' published by the Fire Industry Association (FIA).

10 References

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Fire Statement – 2-4 Whitworth Street, Manchester



Project No: MA24024

Date: 18/11/2024

Revision: R02

Author: Budmika Karuna MSc BEng AIFireE

Reviewer: Jesus Gil MSc BEng AIFireE

Approver: Richard Rankin MEng (Hons) CEng MIFireE

1 INTRODUCTION

OFR Consultants have been appointed by Glenbrook Property to develop the fire strategy for the 2-4 Whitworth Street development in Manchester. This scheme will consist of a single tower which comprises of 44 storeys (136.5 m in height to the top of rooftop parapet wall). The fire statement is required under Article 9A of the Town and Country Planning (Development Management Procedure) (England) Order 2015 (*‘the 2015 Order’*) inserted by article 4 of the Town and Country Planning (Development Management Procedure and Section 62A Applications) (England) (Amendment) Order 2021.

The fire statement aims to provide an abridged version of a Fire Strategy, and follows the process as outlined within the UK Government Guidance issued on 24/06/21 that came into effect on 01/08/21 – which requests submission via a form published by the Secretary of State (or a form to similar effect) containing the particulars specified or referred to in the form, and includes information about (not exhaustive list):

- The principles, concepts and approach relating to fire safety that have been applied to the building.
- The site layout.
- Emergency vehicle access and water supplies for firefighting purposes.
- What, if any, consultation has been undertaken on issues relating to the fire safety of the development; and what account has been taken of this.
- How any policies relating to fire safety in relevant local development documents have been considered.

The following pages contain the fire statement, in the format provided by the UK government.

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Appendix A – Fire Statement

2 FIRE STATEMENT FORM

Application information	
1. Site address line 1	2-4 Whitworth Street West
Site address line 2	
Town	Manchester
County	Greater Manchester
Site postcode (optional)	M1 5WX
2. Description of proposed development including any change of use (as stated on the application form):	New-build high-rise residential building associated with use Class C3 (Residential use only). The proposed scheme consists of the construction of a 44-storey (Ground (G) + 2 Residential Amenity floors + 41 storeys of flats) residential building. Each upper level will be served by a separate firefighting stair and one firefighting shaft which consists of a firefighting stair, two firefighting lifts and two evacuation lifts. The separate firefighting stair is enhanced to allow for fire service interventions as it is fitted with wet riser outlets at each level. Residential amenity spaces are provided on G, 01, and 02 floor levels which include a bike stores, lounges, a gym, a bin store, plant etc. The remaining levels will contain apartments only.

Fire Statement – 2-4 Whitworth Street, Manchester



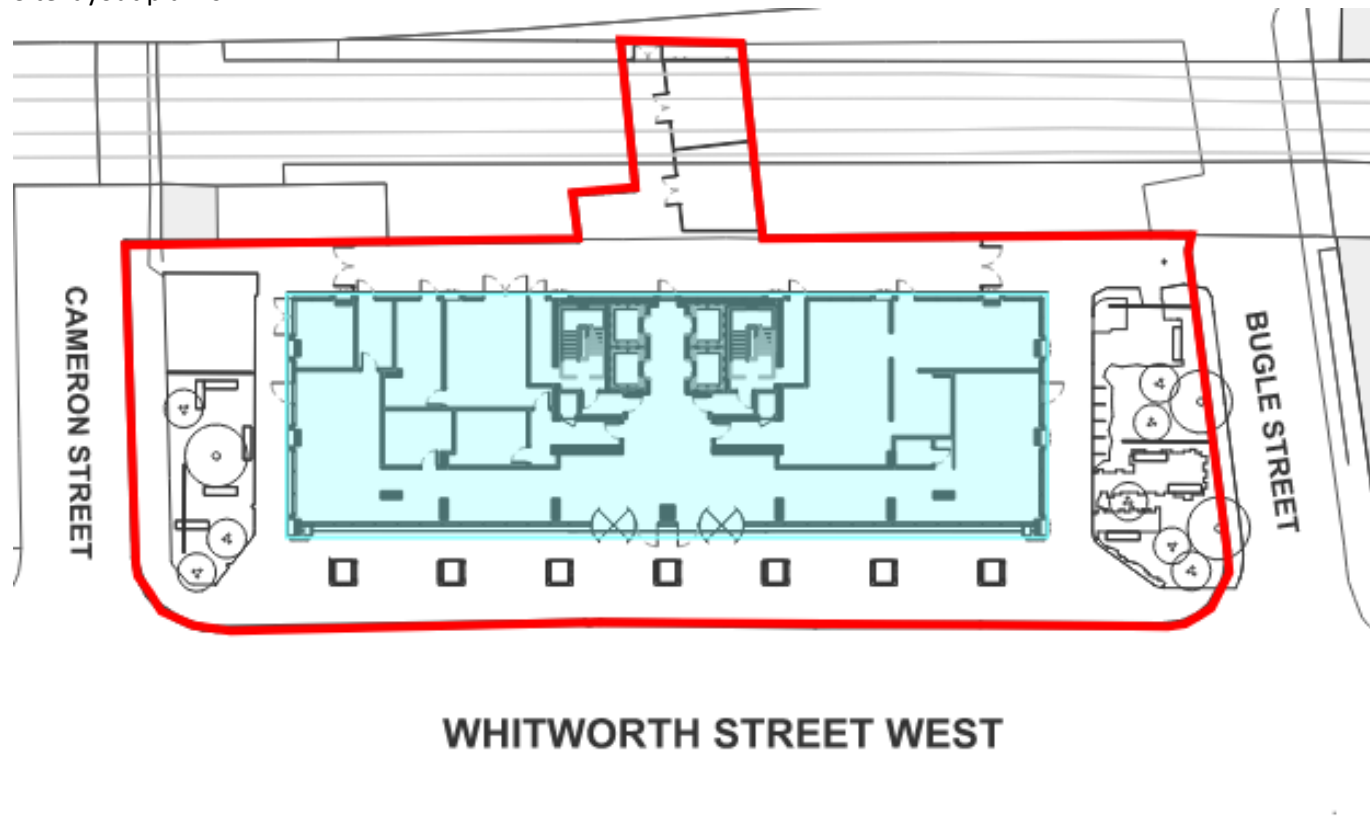
3. Name of person completing the fire statement (as section 15.), relevant qualifications and experience. Guide: no more than 200 words	The OFR-approver of this document (Richard Rankin MEng (Hons) CEng MIFireE) is a registered engineer with the Engineering Council with the post-nominals CEng (Chartered Engineer) and is registered with the Institute of Fire Engineers with the post nominals MIFireE (Member). Richard has 19 years' experience of fire engineering in both the UK and the Middle East. Richard has gained considerable experience of UK and International regulations and approval processes whilst designing fire strategies for a wide range of projects, from simple single storey projects to large and complex mixed-use schemes. Over his career, Richard has developed numerous innovative fire strategies for high-rise residential buildings
4. State what, if any, consultation has been undertaken on issues relating to the fire safety of the development; and what account has been taken of this. Guide: no more than 200 words	Consultation during this early design stage has been undertaken between the fire engineers (OFR Consultants Ltd.) and the key design team members which are Sheppard Robson (architects), Futureserv (M&E) and AKT-II (structural engineers) with regards to meeting the requirements of the Building Regulations 2010 (as amended). Recommendations from these preliminary consultations have been considered and incorporated into the outline fire strategy report developed by OFR. The document is expected to be reviewed by the Building Safety Regulator during the Gateway stages.

Fire Statement – 2-4 Whitworth Street, Manchester

5. Site layout plan with block numbering as per building schedule referred to in 6.

(consistent with other plans drawings and information submitted in connection with the application)

Site layout plan is:



inserted in the form

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Fire Statement – 2-4 Whitworth Street, Manchester



The principles, concepts and approach relating to fire safety that have been applied to the development									
6. Building schedule									
Site information				Building information			Resident safety information		
a) Block no. as per site layout plan above	b) • Block height (m) • Number of storeys excluding those below ground level • Number of storeys including those below ground level	c) Proposed use (one per line)	d) Location of use within block by storey	e) Standards relating to fire safety/ approach applied	f) Balconies	g) External wall systems	h) Approach to evacuation	i) Automatic suppression	j) Accessible housing provided
Sole block on site	136.5 m 44-storeys (G + 43) - No storeys below ground level	Residential flats	03-43	BS 9991:2017	No Balconies	Class A2-s1, d0 or better	Stay-put	Yes – BS 9251:2021 residential sprinklers, full	Yes, to all residential flats, M4(1) as a minimum
		Other residential accommodation	G + 01 + 02	BS 9999:2015	Balconies on the 2 nd floor towards the Whitworth Street	Class A2-s1, d0 or better	Simultaneous	Yes – BS 9251:2021 residential sprinklers, full	None

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7. Specific technical complexities

Explain any specific technical complexities in terms of fire safety (for example green walls) and/or departures from information in building schedule above

The proposed design generally aligns with the recommendations of regulatory fire safety guidance i.e., BS 9991, BS 9999. During this stage of the design, the following items have been highlighted as they are likely to require alternative solutions to the recommendations in regulatory fire safety guidance.

- BS 9991:2015 states that the buildings excess of 50 m high warrants the specific evaluation of the adopted fire safety provisions. A preliminary QDR (qualitative design review) is included in the fire strategy which recommends additional measures to support MIP (mobility impaired persons) escape and fire service access specifically. A full evaluation of structural fire resistance requirements will be carried out at the next stage.
- Lifts suitable for evacuation will be provided to support the evacuation of mobility-impaired persons. A smoke ventilation system is proposed to maintain tenable conditions within the common corridors and the firefighting/ evacuation lobby. The adequacy of this system will be confirmed using Computational Fluid Dynamics (CFD) modelling.
- On the upper floors one of the stairs is arranged as a typical firefighting/evacuation shaft per ADB 2026. At ground floor the stairs are protected with separate lobbies with independent mechanical smoke ventilation. The lift lobby is protected by a fire curtain that will descend to protect the lifts in the event of a fire at ground floor. Both stairs discharge independently to outside and the lift lobby also discharges to outside independent of the reception area.
The glazing which is adjacent to the escape corridor and surrounds the internal void on 1st floor need to achieve 120 minutes fire resisting construction to meet guidance recommendation on compartmentation. This will also allow occupants to escape via the common corridor without getting affected by smoke or heat generation from a potential fire at the void base. Alternative solutions to reduce the extent of fire resistance will be reviewed at the next stage.
- The stairs are provided with separate lobbies at ground floor. The lobbies are independently ventilated with mechanical systems, connected to the smoke shafts running from ground to roof.
- BS 9991 recommends kitchens within open plan flats are located away escape route. Radiation calculations will be completed at the next design stage to determine the suitability of hob locations to ensure adequate escape conditions can be maintained. OFR have recommended that hobs are located at least 1.5m away from the internal escape routes (defined by analysis of the thermal radiation received as occupants escape past the hob) to reduce the risk of radiation from a potential cooking fire impacting means of escape. Internal layouts of the flats meet this recommendation.

8. Issues which might affect the fire safety of the development

Explain how any issues which might affect the fire safety of the development have been addressed.

- The building height surpasses 18 m; therefore, it falls under the remit of Regulation 7(2), which imposes restrictions on the materials that can be used within the external wall build up. All elements (which are not exempt) of the external wall build-up will achieve Class A2-s1, d0 or Class A1 to meet Regulation 7.
- The building height and the upper floor areas demand one firefighting shaft, which is provided in this design. This firefighting shaft that includes two firefighting lifts, two evacuation lifts (recommended by OFR due to building height) and one firefighting stair. Additionally, the escape stair is proposed to be designed as a firefighting stair to allow fire service interventions as it is fitted with wet riser outlets at each level. The common corridor will be provided with a push-pull smoke ventilation system. Additionally, the firefighting shaft includes a ventilated firefighting/ evacuation lobby which provides refuge for mobility impaired occupants when evacuating the building during a potential fire scenario.
- The discharge route from both stairs is directed through protected corridors which lead to outside. The corridors are 1350 mm wide and has the capacity to accommodate the total occupancy during a full building evacuation.
- Due to the height of the building, all areas will be provided with sprinkler protection. OFR have recommended the following at this stage in the design:
 - Residential Areas
 - Category 4 residential sprinkler system in accordance with BS 9251: 2021 (Fire sprinkler systems for domestic and residential occupancies)
 - Non-residential Areas
 - Category 4 residential sprinkler system for residential (ancillary) areas as per Table 3 in BS 9251: 2021. The only non-residential space in the building which has a floor area greater than 100 m² is the entrance lobby. Table 3 and 4 of BS 9251 states that the foyer/reception areas are not subject to this 100 m² limits and hence, it is OFR opinion that these spaces can be served by a sprinkler system complying to BS 9251:2021 regardless of the area. However, as the building height is greater than 50 m, a probabilistic fire severity assessment will be carried out which will be utilized to demonstrate the adequacy of the approach.
- The evacuation strategy for the studios will be a 'stay-put' policy whereas amenity and ancillary areas will operate a simultaneous evacuation strategy. The residential alarm system should not be linked to the alarm system in non-residential/ amenity areas.
 - The stair widths will be sized to allow for a full evacuation of the building.
- As the building has a top storey over 18 m above ground level, an evacuation alert system should be provided in accordance with BS 8629:2019.
- A preliminary space separation assessment has been conducted following the methodology outlined in BR 187 and it shows that the rear elevation of the building up to 3rd floor level requires external wall protection with 120 minutes fire resisting construction to the calculated percentages of the wall area as a minimum.

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9. Local development document policies relating to fire safety

Explain how any policies relating to fire safety in relevant local development documents have been taken into account.

Not applicable.

Emergency road vehicle access and water supplies for firefighting purposes

10. Fire service site plan

Explanation of fire service site plan(s) provided in 14. including what guidance documents have informed the proposed arrangements for fire service access and facilities?

The Fire Service access and facilities provisions will be based on BS 9991 and BS 9999 as shown in Section 14.

As the building height is more than 18 m above the fire service access level and maximum floor area of a floor plate on an upper level is less than 900 m², the building is provided with a firefighting shaft with a fire-fighting lift. As the building height is more than 50 m, it is fitted with wet risers in compliance with the guidance. Due to height, the second stair will be designed as a firefighting stair with wet main and a second firefighting lift will be provided in the main fire-fighting shaft for redundancy.

The site is primarily accessed via Whitworth Street. There are access routes to the east and west of the building and to comply with the guidance recommendations, they need to provide access to the building within 18m of:

- Entrances to the stairs
- Inlet for wet riser
- Inlet for sprinkler tank

Fire Statement – 2-4 Whitworth Street, Manchester



11. Emergency road vehicle access

Specify emergency road vehicle access to the site entrances indicated on the site plan

As noted in Section 10, vehicular access to the site will be via Whitworth Street and to the rear side of the building via both streets either side of the building. As the fire service is not required to drive more than 20 m into the site along Cameron Street to get within 18 m of the entrance to the primary firefighting shaft and sight of the fire main inlet connection, turning facilities are not required. However, a turning head is provided at the end of this street, in order to provide access to the entrance riser. Additionally, alternative access is provided through Bugle Street. As a redundancy, the fire service can also access the stairs through the main building entrance at Whitworth Street West. This is considered a suitable access route in the event of a fire on an upper floor. A fire at ground can be dealt with direct from outside.

Is the emergency vehicle tracking route within the site to the siting points for appliances clear and unobstructed?

yes

12. Siting of fire appliances

The firefighting strategy for the building will be internal via the firefighting shaft equipped with wet risers. Additionally, the fire service will be able to use the separate firefighting stair as it is enhanced for fire service use with fitted wet riser outlets at each level. Vehicle access for pumping appliances will be accommodated. The inlets for the wet riser and sprinkler systems will be provided within 18 m of the fire appliance parking position, as recommended in BS 9991.

13. Suitability of water supply for the scale of development proposed

A public external hydrant is located approximately 50m from the proposed building. This hydrant is located at the intersection of Albion Street and Whitworth Street. The location and the operational status of this hydrant is to be confirmed by the Fire Service. However, the provision of sprinklers reduces the reliance on the hydrant flow rates and performance. If existing hydrant provisions do not align with BS 9991 recommendations, additional hydrant (s) will be provided within 90m of the fire main infill inlet to meet BS 9991 recommendations.

Nature of water supply:

hydrant- public

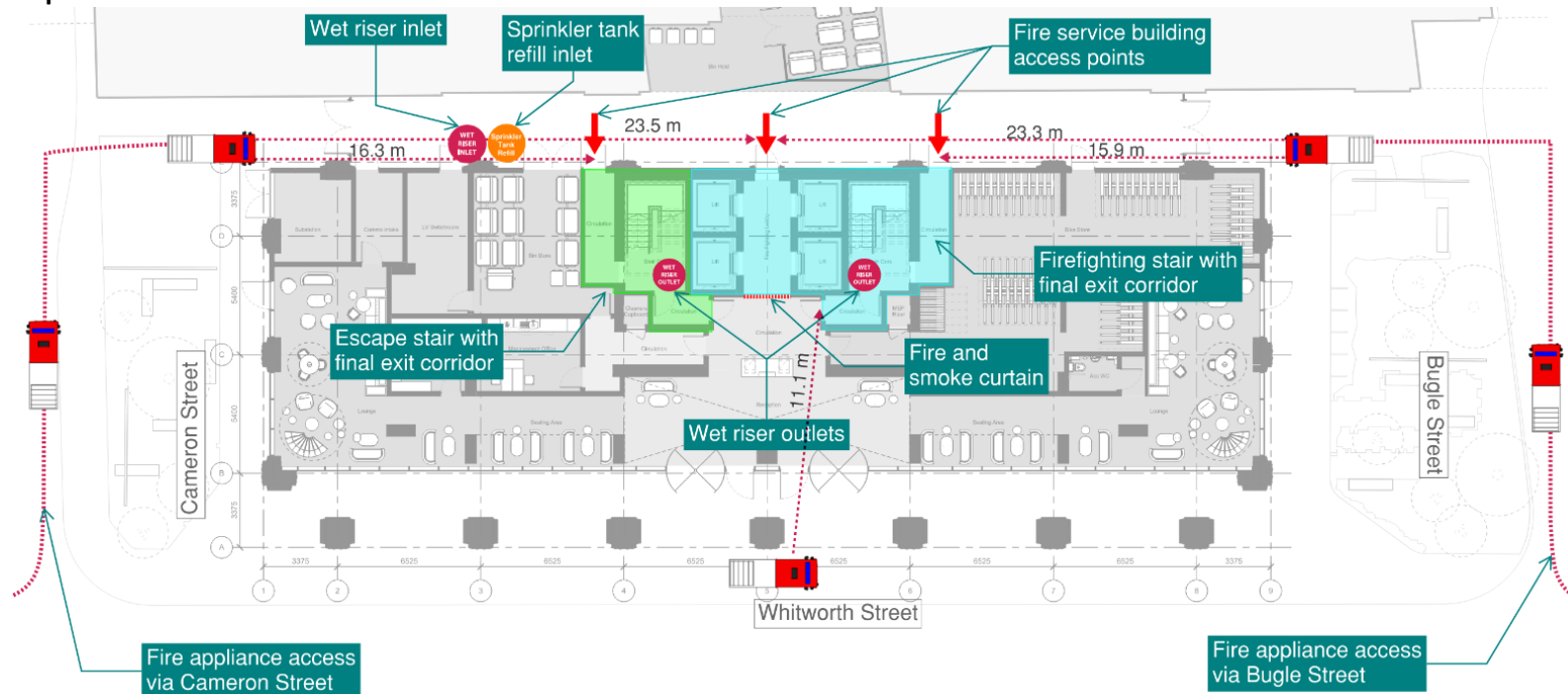
Does the proposed development rely on existing hydrants and if so are they currently usable / operable?

yes

Fire Statement – 2-4 Whitworth Street, Manchester

The suitability of the existing public fire hydrant(s) will be reviewed with the Fire Service at the next stage. Existing hydrants will be surveyed and supplemented with new/additional hydrants as necessary to ensure compliant provision in terms of pressure, flow rate and distance from wet riser inlets and fire service vehicle locations.

14. Fire service site plan



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Fire Statement – 2-4 Whitworth Street, Manchester



Fire statement completed by		
15. Signature		
16. Date	18/11/2024	