



Report

Project	One Park Place, Manchester
Report Title	Fire Engineering Review
Our Ref	HM2442/R1 Issue 1

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Checked	JR					
Approved	SA					

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1.0 INTRODUCTION

1.1 Description of Building

One Park Place is a proposed residential development in Manchester. The building will have 25 storeys above ground with 154 apartments.

The ground floor will consist of ancillary uses such as a reception, plant room, cycle store and two commercial units. There will also be a mezzanine level above ground with an additional commercial unit, two amenity spaces and plant rooms.

Apartments throughout the building will be open plan apartments and the building will have a top storey height of approximately 71m. A typical upper floor layout is shown in Figure 1.



Figure 1- Upper Floor Layout

1.2 Aim of Report

This report summarises a review of the proposals and highlights key fire strategy issues. The review is intended to aid the design team in the development of the design.

This report, although may aid initial Building Control discussion, is not intended for submission to Building Control or the Fire Brigade. A more detailed report will be prepared that is suitable for submission as the design develops and once the fire strategy principles have been agreed amongst the design team.

This report considers life safety only, not property protection.

2.0 QUALITATIVE DESIGN REVIEW (QDR)

As the building has a top storey of over 50m a qualitative design review (QDR) is needed with the relevant stakeholders including Building Control and the local Fire and Rescue authority to establish the functional objectives for the fire strategy and identify whether due to the proposed layout and building height additional fire strategy provisions beyond BS 9991 recommendations are required to achieve this.

We have included some recommended enhancements based on previous experience.

3.0 ACTIVE FIRE SAFETY SYSTEMS

3.1 Sprinklers

The building will have a top storey height of more than 11m above ground. Therefore, the building will need to be fitted with a sprinkler system throughout.

In line with current BS 9251: 2021 guidance, the residential levels of the building will require a category 4 sprinkler system since the occupied top storey height is greater than 18m.

The commercial units are each less than 100m² allowing the residential sprinkler system to be extended to these spaces as opposed to a commercial system. If the ground floor layout is reconfigured and the area of the commercial units exceed 100m² a commercial standard sprinkler system will be required.

3.2 Automatic Fire Detection and Alarm

Flats should be provided with an LD1 automatic fire alarm and detection system to support the open layouts.

The ancillary areas of the building e.g. plant, stores, amenity spaces etc, should be provided with at least an L3 automatic fire alarm and detection system.

3.3 Evacuation Alert System (EAS)

An evacuation alert system is a system that gives the Fire and Rescue Service the ability to initiate an alert signal in all flats of the building without having to physically walk door to door. As of 2022 it is now a Building Regulations guidance recommendation to provide an EAS system in all residential buildings with a top storey height over 18m. An evacuation alert system should be provided in accordance with BS 8629.

3.4 Smoke Venting

Smoke venting should be provided in residential corridors, refuse stores/refuse store lobbies and the reception. This is discussed in more detail in the relevant sections of the report.

3.5 Back-up Power

The building should be provided with back-up power. This could be via diverse routes, complying with the guidance in Section 15, BS 9991: 2015.

4.0 EVACUATION STRATEGY

4.1 Apartments

The apartments should operate with a 'defend in place' strategy in which only the fire affected apartment will evacuate in the first instance.

4.2 Ancillary Areas

Upon fire detection in any amenity/ancillary areas, all amenity and ancillary areas throughout the building should evacuate simultaneously.

4.3 Commercial Units

Each commercial unit should evacuate independently to the rest of the building. The unit should evacuate for a fire detected within the unit only.

5.0 APARTMENT LAYOUTS

5.1 General

All apartments have open plan layouts. This is acceptable on the basis that sprinklers and an LD1 automatic fire detection and alarm system are provided.

The ceiling height in all flats should be at least 2.25m above floor level.

5.2 Open Plan Flats

Guidance recommends that kitchens should be enclosed in flats larger than 8m x 4m. This would apply to a number of the proposed flats. On similar residential buildings we have developed a case for the kitchens being unenclosed in larger flats than recommended by the guidance and we could do the same here. In this case, cooking appliances should be located remote from the flat entrance and flat internal escape route. There is no specific distance recommended currently, but at least 2m is typically accepted.

A typical flat layout is shown in Figure 2.



Figure 2- Open Plan Flat Layouts

6.0 MEANS OF ESCAPE- RESIDENTIAL

6.1 Number of Stairs

The building will be served by two stairs. The stair arrangement is shown in Figure 3. Stair 2 should be designed as a firefighting stair and should be at least 1.1m wide. Both stairs should be provided with a 1m² AOV at the head.

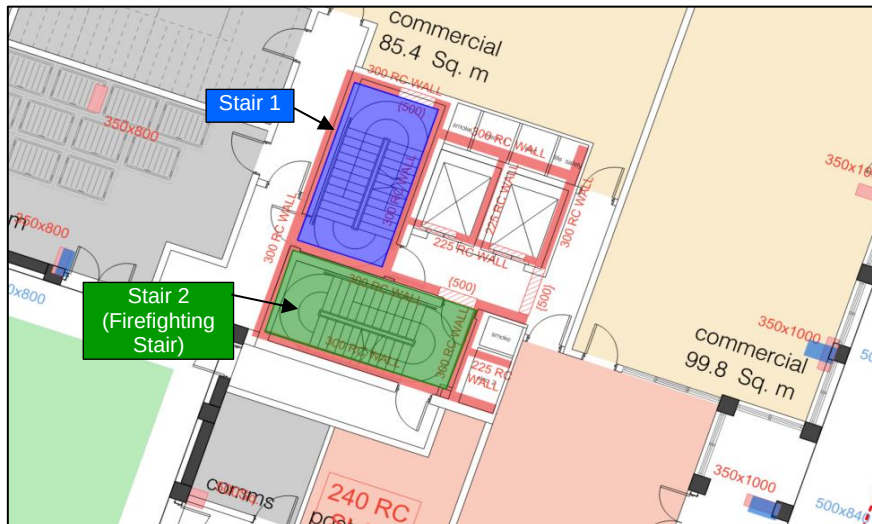


Figure 3- Stair Arrangement

6.2 Ground Floor

6.2.1 Description

The ground floor will contain a reception, two commercial units, plant rooms, a refuse store and a cycle store.

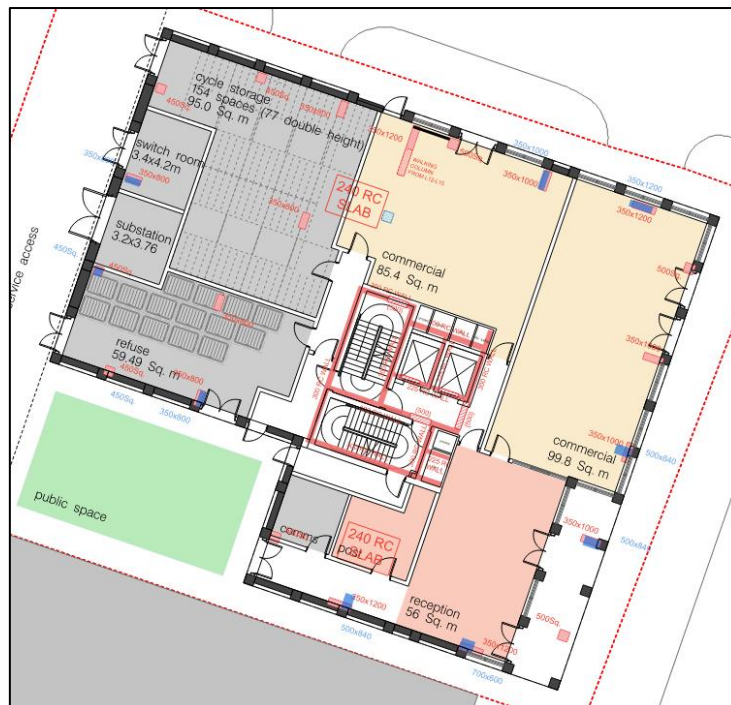


Figure 4- Ground Floor Layout

6.2.2 Stair Final Exits

Building Regulations guidance recommends that the stairs should discharge directly to outside or to outside via a protected corridor. Protected escape routes are provided however there are connections to ancillary accommodation such as the refuse store and reception which should be provided with smoke vented lobbies.

6.2.3 Refuse and Cycle Store

The refuse store and cycle store share a direct connection to the Stair 1 escape route at ground. The stair final exit route should not connect to ancillary accommodation.

To support this layout the lobby serving the refuse store and cycle store should also be vented with 1.5m^2 permanent venting or the mechanical equivalent. Typically, 0.4m^2 venting is sufficient to a refuse store lobby however the venting requirements should match that of the residential stair to provide a sufficient degree of protection. The arrangement is shown below in Figure 5.

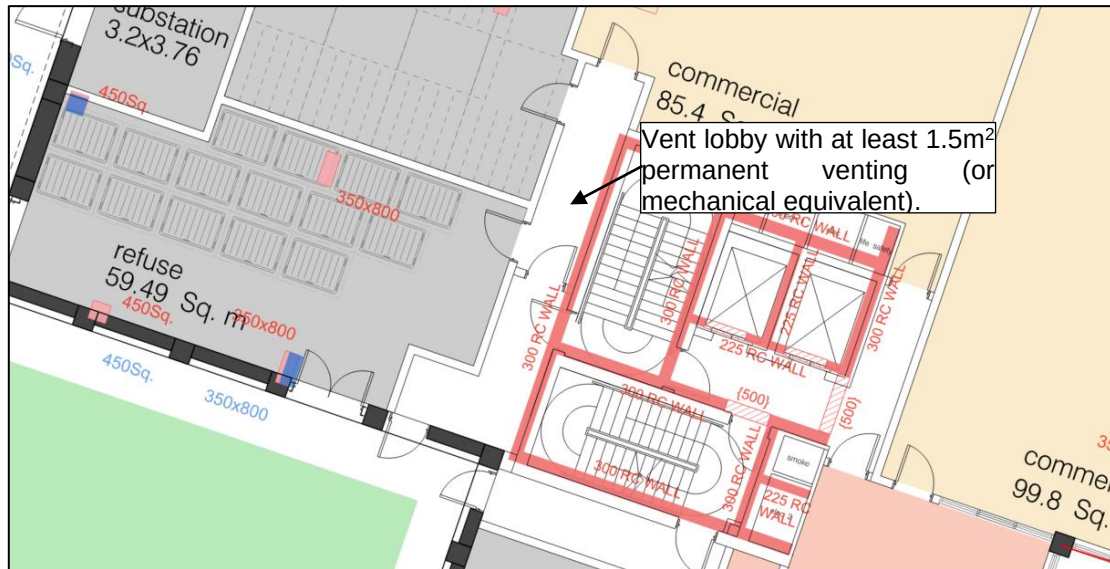


Figure 5- Venting of Refuse Store/ Cycle Store Lobby

6.3 Amenity Spaces

There are two amenity spaces at the mezzanine level and a roof terrace at level 15. Travel distances in the amenity spaces should be limited to 18m in a single direction or 45m when there is a choice of escape routes.

Occupants escaping from the mezzanine amenity spaces will need to escape past the void over reception. To comply with Building Regulations occupants should not have to escape within 4.5m of an open void. We recommend that fire resisting glazing is provide around the void as outlined in Section 9.3.

6.4 Commercial Connection

There should be no connection between the commercial unit and the residential parts of the building. The doors currently shown at ground and mezzanine level should be removed.

7.0 MEANS OF ESCAPE- COMMERCIAL

7.1 Description

There are two commercial units at ground floor and a single commercial unit at the mezzanine level. Each unit is less than 100m².

7.2 Sprinklers

Sprinklers are not required to the commercial units on the basis that the floor area in each unit remains less than 100m².

7.3 Means of Escape

The units are small and will have a low calculated occupancy. A single exit is sufficient if the unit is a shop, but two should be allowed for if it may be a restaurant or café. Exits should be at least 850mm wide and spaced apart.

The travel distances are well within the recommended limits and there is good flexibility for fitout.

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Two smoke vented lobbies should be provided as shown in Figure 6. This principle should also be applied at the non-residential mezzanine level.

The diagram is a detailed architectural floor plan of a building, likely a residential or institutional structure, showing the layout of rooms, corridors, and stairwells. The plan is oriented with a dashed red line indicating a 7.5m dimension. Key features include:

- Rooms and Areas:** Several rooms are labeled with their area in square meters (Sq. m):
 - 1B2P (50.0 Sq. m) - Located in the upper left and lower right.
 - 2B3P (61.0 Sq. m) - Located in the upper right.
 - 1B2P (50.0 Sq. m) - Located in the lower right.
- Stairwells:** Two stairwells are shown, each with a staircase and a door. They are labeled with "300 RC WALL" and "300 RC WALL (500)".
- Proposed Smoke Shafts:** Two green rectangular areas are labeled "Proposed smoke shafts" with arrows pointing to them. They are labeled with "325 RC WALL (500)".
- Smoke Vented Section:** A blue rectangular area is labeled "Smoke vented section of corridor to protect the stair" with an arrow pointing to it. It is labeled with "225 RC WALL (500)".
- Other Features:**
 - A red dashed line indicates a 7.5m dimension.
 - Various wall types are labeled: "300 RC WALL", "325 RC WALL", "225 RC WALL", and "300 RC WALL (500)".
 - Other labels include "350x1000", "350x1", and "350x1000".

Figure 6- Smoke Control at Upper Levels

9.0 STRUCTURE AND COMPARTMENTATION

9.1 Structure

The building has a top storey height exceeding 30m, therefore elements of the buildings structure should achieve 120 minutes fire resistance.

Structure which only supports the roof does not need to be fire resisting.

9.2 Compartmentation

The following elements of the construction should be constructed as compartments and achieve the following fire resistance:

Part of Building	Fire Resistance
Floors (constructed as compartment floors)	2 hours
Amenity Spaces	1 hour
Stair and Lift Enclosure	2 hours
Stair final exit/ firefighter access route	2 hours
Commercial Units	2 hours
Apartment enclosures	1 hour
Amenity Spaces	1 hour
Reception/ post rooms	1 hour
Service risers	2 hours
Plant Rooms	1 hour
Life Safety Plant Rooms	2 hour
Refuse Store	1 hour
Cycle Store	1 hour

Table 1- Fire Resistance Periods

9.3 Cavity Barriers

Cavity barriers should be provided in accordance with Section 8 of ADB: Vol 1.

9.4 Fire Stopping

Fire stopping should be provided in accordance with Section 9 of ADB: Vol 1.

10.0 FIREFIGHTING

10.1 Firefighting Facilities

The building has top floor more than 18m above ground level and each block should therefore be provided with a firefighting shaft, which includes:

- A firefighting stair, at least 1.1m wide,
- A firefighting lift, within 7.5m of the stair entrance,
- A wet riser located within the stair,
- A 1m² automatically opening vent at the head of the stair.

The firefighting shaft will be accessed via the public space at the rear of the building. Construction that forms part of the firefighter access route should achieve a minimum of two hours fire resistance. Also, any construction within 5m of the firefighting shaft should achieve a minimum of two hours fire resistance.

At least one of the lifts should be designed as a firefighting lift. We recommend the second lift should also be designed as a firefighting lift to provide additional resilience. This second lift could also serve as an evacuation lift.

10.1.1 Services accessed from the stair

Services, other than firefighting only services, should not be accessed from the stair or ground floor stair/lift lobby.

10.2 Firefighter Access

Firefighter access should be available from 50% of the buildings and the dry riser inlet should be located in sight of and within 18m of a fire vehicle parking position.

10.3 Hose Coverage

Hose coverage should not extend more than 60m from the dry riser outlet within the firefighting stair to the most remote apartment. This is achieved in the current layout.

10.4 Hydrants

Each dry riser inlet should have access to a fire hydrant within 90m, measured on a route suitable for laying a hose.

10.5 Wayfinding Signage

Wayfinding signage for the Fire Service should be provided to comply with Section 15 of the Approved Document B Volume 1.

11.0 EXTERNAL FIRE SPREAD

11.1 Unprotected Areas

Based on the large boundary distances, residential use and provision of sprinklers, we do not anticipate any restrictions on the amount of non-fire-resisting construction on the North, and West elevations.

The South and East elevations form a double height compartment at ground due to the mezzanine and void over reception. If the glazing around the reception void is provided as per **Error! Reference source not found.** this will reduce the compartment width and allowing for the East elevation (at the ground and mezzanine levels) to remain unprotected.

The South elevation (also comprising the reception and mezzanine) is close to the site boundary. Preliminary external fire spread calculations show that this elevation would have a permitted unprotected area of approximately 33%. We do not anticipate any restriction on the allowable unprotected area of the South and East elevations at the upper levels comprising the flats.

A detailed assessment of the allowable unprotected area will be undertaken as the design develops and provided as part of the fire strategy.

11.2 External Wall Construction

As the building exceeds 18m in height, all materials used in the construction of the external wall should achieve European Class A2-s1, d0 or Class A1, except for sealants, gaskets, doors and windows (including frames); (see regulation 7(3) for the full list of exemptions).

Membranes within the external wall should achieve a minimum Class B-s3, d0.

This also applies to “specified attachments” including balconies, solar panels and solar shading devices attached to the external wall.

12.0 INFORMATION, LIMITATIONS AND ASSUMPTIONS

The information limitations and assumptions used in the preparation of this report are noted below: -

Drawings

This report is based on drawings issued to us. Dimensions have been taken from these drawings. The following drawings were used: -

- | L(-)000_Ground Floor Plan
- | L(-)001_Level 01 - Mezzanine Floor Plan
- | L(-)002_Level 02 Floor Plan
- | L(-)003_Levels 03, 05, 07, 09 Floor Plan
- | L(-)004_Levels 04, 06, 08, 10 Floor Plan
- | L(-)011_Levels 11, 13 Floor Plan
- | L(-)012_Levels 12, 14 Floor Plan
- | L(-)015_Level 15 Floor Plan
- | L(-)016_Levels 16, 18, 20, 22, 24 Floor Plan
- | L(-)017_Levels 17, 19, 21, 23 Floor Plan
- | L(-)400_North Elevation
- | L(-)401_East Elevation
- | L(-)402_South Elevation
- | L(-)403_West Elevation
- | L(-)404_North Elevation - Park Place Long Elevation
- | L(-)405_East Elevation - Cheetham Hill Road Long Elevation
- | L(-)500_Site Plan
- | L(-)501_Location Plan

Building Regulations

This report considers building regulations, which deal with life safety. Property protection and insurance issues are not addressed in this report. Guidance on property protection and insurance requirements can be found in the document *Approved Document B: Fire Safety (Volume 2) – Buildings other than dwellinghouses Incorporating Insurers' Requirements for Property Protection*, RIBA Publishing 2015.

Other Limitations

Complying with the recommendations of this report will not guarantee that a fire will not occur.

Unless otherwise described in this report, the fire strategy assumes that the building design, the mechanical and electrical systems, construction methods and materials specifications will comply with current Building Regulations guidance, and relevant British Standards and Codes of Practice. The design of mechanical and electrical systems such as fire alarm and sprinklers is a specialist area. Fire Strategy recommendations are given in this report, however, the design and specifications need to be developed at the appropriate stage in consultation with the specialist designers of these systems.

This report has been prepared for the sole benefit, use and information of Zerum and the liability of Jeremy Gardner Associates Limited, its directors and employees in respect of the information contained in the report will not extend to any third party.

OFFICES AND CONTACT INFORMATION

Should you have any queries with this report please contact our Manchester Office.

Manchester Office:
Suite 9C
Manchester One
53 Portland Street
Manchester
M1 3LD
Tel: +44 (0)161 236 6527
manchester-jga@jensenhughes.com

OTHER JH OFFICES AT:

London Office:
209-215 Blackfriars Road
London
SE1 8NL
Tel: +44 (0)20 7202 8484
london-jga@jensenhughes.com

Edinburgh Office:
22 Hanover Street
Edinburgh
EH2 2EP
Tel: +44 (0)131 226 1661
edinburgh-jga@jensenhughes.com

Dublin Office:
9 Upper Baginbun Street
Dublin 4
D04 A6W7
Tel: +353 (0)1 661 4925
dublin-jga@jensenhughes.com

Birmingham Office:
Suite 205, Cheltenham House
16 Temple Street
Birmingham
B2 5BG
Tel: +44 (0) 121 281 4513
birmingham-jga@jensenhughes.com

Glasgow Office:
30 Gordon Street
Glasgow
G1 3PU
Tel: +44 (0)141 847 0446
glasgow-jga@jensenhughes.com

Galway Office:
Office 3, Monterey Court
Salthill, Galway
Ireland
Tel: +353 (0)91 528 342
galway-jga@jensenhughes.com

