

LONDON PLAN FIRE SAFETY POLICY D12(A)

Planning Fire Safety Strategy

4-6 Bedford Place

PROJECT: 4-6 Bedford Place – Hotel

DATE OF ISSUE: 1 December 2023

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REVIEWED BY: Romain HOURQUEIG

SUBJECT: Planning Fire Safety Strategy – Demonstrating compliance with Policy D12(A)

1 Introduction

This report outlines the planning stage Fire Safety Strategy for the hotel development addressed at 4-6 Bedford Place, WC1B 5JD London.

A Grade II listed building, currently used for hotel purposes, is to be refurbished and extended on lower ground floor and ground floor. The proposed development will provide up to 43 guestrooms, with ancillary amenity spaces and a lounge/reception area. Upon completion of the project, the building will continue to be used as a hotel.

The objectives of this Planning Fire Safety Strategy (PFSS) are to set out how this planning application satisfies the Policy D12 Fire Safety of the London Plan 2021.

The proposed development is a non-major development and is therefore required to demonstrate compliance with Policy D12(A), such as through the submission of a PFSS. This report has been developed following the standard report guidance described in the ***London Plan Guidance (LPG) – Fire Safety – February 2022***.

Ultimately, the design will meet the functional requirements of Parts B1-B5 of the Building Regulations 2010 and follow the guidance provided in ***ADB Volume 2: Buildings other than dwellings – 2019 edition – incorporating 2020 and 2022 amendments***.

2 Competency statement

The PFSS has been written by Camille Le Compagnon who is a fire safety engineer employed by Studio Fahrenheit and reviewed by Romain Hourqueig who is the co-founder of Studio Fahrenheit.

2.1 Author: Camille LE COMPAGNON

Camille is an engineer, specialized in energy and thermal sciences, with software development skills. She graduated in France (Master of Science) and has been employed in fire consultancy for over 7 years undertaking roles such as:

- *Design, explosion and fire engineer in Belgium performing fire hazard analysis for nuclear power plants.*
- *Fire engineer in New Zealand developing performance-based fire engineering designs for buildings.*
- *Project manager in France designing and installing sprinkler systems to industrial and public buildings.*
- *Fire engineer at Studio Fahrenheit developing fire strategies for buildings internationally.*

Camille has worked with NZ fire Regulations, Australian Standards, British Standards, NFPA and performed advanced computer modelling of fire/smoke (B-Risk, FDS) and evacuation (Pathfinder).

2.2 Reviewer: Romain HOURQUEIG

Romain Hourqueig is a well-regarded Fire Engineer with over 18 years practical experience. Romain is the president of the SFPE (Society of Fire Protection Engineers) – French Chapter, a member of the CTBUH (Council for Tall Buildings & Urban Habitat) – French Chapter and an Associate member of the Institution of Fire Engineers (IFE) in the UK.

Romain co-founded Studio Fahrenheit in 2019 that delivers fire & life safety services to clients in France and abroad (without geographical limits) across all sectors of the built environment. Before that, his most recent position was to head up the fire engineering team at WSP UK (based in London) and at WSP France. His experience involves projects in all types of sectors, also where different fire regulations are applicable: varying from the UK (British Standards), Russian SNiP standards, Middle East (American NFPA standards), Belgium Royal Decree to Morocco & France (French standards).

Romain served 10 years as a retained fire-fighter in France. He is a regular teacher on fire safety engineering at the French National School for Fire Brigade Officers (ENSOSP) and former professor at the engineering school of Rouen (INSA).

3 Building description

The property, located at 4-6 Bedford Place, London, WC1B 5JD, is an existing hotel (Class C1) that will be subject to the following extent of works:

- *Internal reconfiguration associated with restoring and refurbishing the existing hotel (Class C1).*
- *Ground and lower ground floor rear extensions.*
- *Repairs and replacement of roof.*
- *New lift-overrun.*

- *Alterations to the front and rear façades.*

The building will continue to be used for hotel purposes once all renovation works are completed.

The building has 4 storeys above ground level, plus a lower ground floor (below street level). The topmost floor (3rd floor) is located 12.6m above street level (of Bedford Place). The refurbished project aims at proposing 43 hotel bedrooms distributed over the floors (from Lower Ground Floor to 3rd Floor).

The building is only accessible through the South façade along Bedford Place where three front entrances are provided.



Figure 1: Proposed front elevation.

The East and West façades are blind façades immediately adjacent to other buildings (party walls). To the South, the building faces Bedford Place and to the North, it faces a private green park.



Figure 2: North façade – satellite view (Google Maps)

The fire strategy advice in this document was developed based on the drawings and information provided by Studio Moren Ltd.

4 London Plan Policy D12(A)

4.1 Suitable unobstructed outside space for fire appliances and assembly points

The Fire Brigade vehicle access is along Bedford Place, a two-way vehicle road. A high-reach fire-fighting appliance can park within 18m of the building and have direct access to the three front entrances, two of which are escape stairs. Therefore, the Fire Brigade will have several entry points into the building should one of them become unavailable.

Street fire hydrants must be located within 90m of the dry main inlet. A street hydrant is located at the intersection of Bedford Place and Bloomsbury Square; circa 71m away from the furthest escape stair in the building, which complies with ADB Vol 2.

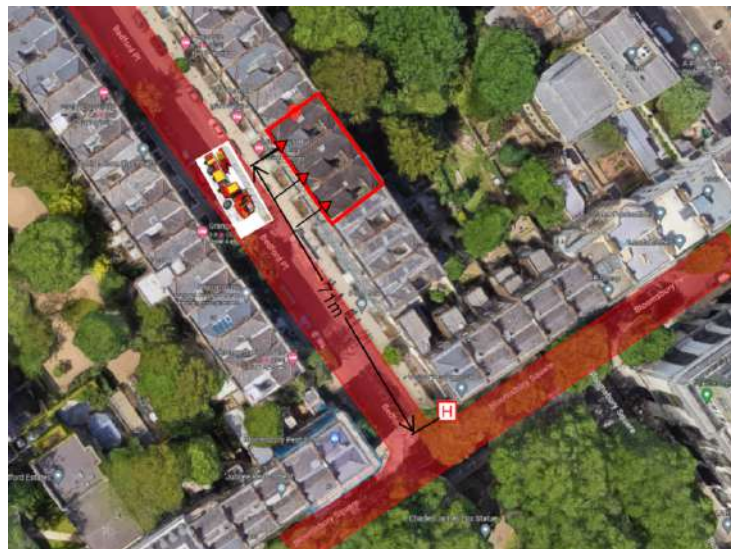


Figure 3: Vehicle access for Fire Brigade

Assembly points should be allocated in a safe area sufficiently far from the premises to avoid interference with the fire and rescue service or danger from falling debris. Once out of the building, the public street of Bedford Place provides unobstructed outside space and is appropriate for use as an evacuation assembly during both the construction phase and final occupation.

4.2 Passive and active safety measures to reduce the risk of life and injury

A BS 5839-1 category L1 system will be installed throughout the building (automatic fire detection in bedrooms, communal areas, circulation spaces, ancillary rooms and plantrooms), connected to the main fire panel installed at reception.

The fire alarm system will be programmed on coincidence detection to reduce false alarm occurrences (i.e., actuation of two smoke detectors is needed to trigger the fire alarm sounders).

The building will be managed 24/7 by a concierge/building manager (1 person) present on site. Therefore, the alarm system will allow for a 5-min investigation period to enable the staff member to investigate any single fire detection recorded on the main fire panel.

Additionally, a high degree of compartmentation is proposed across the building:

- *Based on the top storey's height (<18m), all structural elements of the building will be provided with 60-min fire protection (R60).*
- *All floors will be REI 60.*
- *All bedrooms open into a 30-min protected corridor leading to two 60-min fire resisting escape stairs located at each end of building.*
- *All protected shafts will be fire rated to 60 minutes (risers and lift).*
- *Fire rated cross-corridor doors will subdivide the protected corridors to safeguard the escape routes from smoke and isolate the dead-end corridors from the remaining parts of corridor.*
- *The refuse room will be enclosed in 60 minutes fire resisting construction.*
- *Cavity barriers will be provided in accordance with section 9 of ADB Vol 2: 2022 (where required) to close the edges of all cavities, including around openings, at the junctions between external cavity walls, at every compartment floor and compartment wall, and at the junctions between internal cavity walls, in protected escape routes, and any corrugated or profiled insulated roof sheeting.*

All floors are required to be compartment floors (REI 60). Due to heritage significance of some lath and plaster ceilings that must be retained, two construction methods will be used to achieve the 60 minutes fire rating of floors.

1) Replacement of suspended ceilings: LGF, L2 and L3

At **lower, second and third floor levels**, suspended ceilings already exist under the original lath & plaster timber floors. They were installed in 1978 with listed building consent.

It is proposed to replace the existing suspended ceilings with fire rated suspended ceilings offering a 60-minutes-tested performance (British Gypsum standard or comparable product). The new fire rated ceilings will be supported by the structural elements of the floor (through the lath & plaster layers) and will provide insulation and integrity rating to all the floor elements above, including the structural beams, thus achieving REI 60 of the total floor build-up. The proposed suspended ceiling system will be installed as per the manufacturers guidance with full British Gypsum (or comparable) components used.

As roof voids contain technical equipment (such as ventilation plant), the third floor is also required to have a fire rated ceiling achieving REI 60 rating.

2) Floor strengthening and provision of Corofil CF slab (or comparable) system: GF and L1

Lath & plaster ceilings on **ground and first floors** are to be retained as part of the heritage significance, as these floors have retained their original historic proportions, and decorative details are found on the skirting, window and door architraves and the cornices.

At these levels, it is therefore proposed to:

- 1) To **Strengthen the floors** above ground and first floor levels to upgrade the structural fire rating to R60 minutes (refer to the Design Statement where structural strengthening works are detailed) and to match the testing conditions of the Corofil slab system (below).

and

- 2) To provide a **tested fire protection system** from above the existing retained ceiling which will sit between the timber joists and under the floor boards, such as the **Corofil CF fire protection system** (see figure below). This flooring system is a method for increasing the fire resistance of timber compartment floors, which has been tested in accordance with EN 1365:2 and satisfies the requirements of Building Regulations.

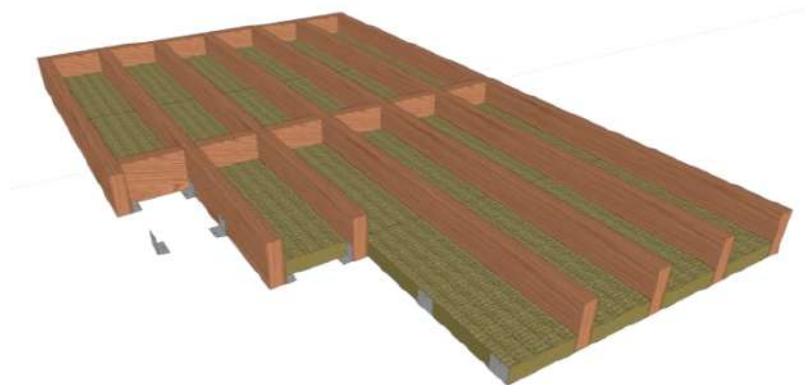


Figure 4: PFCTS CF system using the Corofil slab

The Corofil slab system will provide the EI 60 rating (i.e., 60 minutes integrity and insulation rating) that is required for floors in buildings of such height and use.

The floor slabs above ground and first floor will achieve, at the end, a REI 60 rating as required by ADB.

Based on the height and commercial type of the building, it is not required to provide sprinkler protection.

The lower ground floor (that classifies as a basement) will be provided with a means of venting smoke consisting of natural smoke vents with an area equivalent to 2.5% of the floor area of the basement, sited at high level, and evenly distributed around the building (on at least two sides) to facilitate clearance.

4.3 Construction products methods and materials to minimise fire spread risk

The proposed building construction methods and materials are provided by Studio Moren Ltd, the architects for the redevelopment scheme, and can be summarised as follows: brickwork matching existing London Stock is proposed as the main external materials, proposed new windows will be painted timber sash windows to match the existing. Existing roof tiles will be cleaned and repaired when possible and new lead cladding or similar is proposed elsewhere. There will be decking and planting to some flat roof areas, with photovoltaic panels.

Given that the proposed development consists of residential purpose group 2(b) over 11m in height, the external surface of walls should be classified A2-s1, d0 or better, as tested and certified under BS EN 13501.

Any insulation product and filler material used in the external wall construction should achieve at least Class A2-s1, d0 or better in accordance with BS EN 13501-1.

Where the building is within 6m of the site boundary, the roof should achieve BROOF(t4) when tested in accordance with BS EN 13501-5. Elsewhere, the external roof surfaces will achieve at least a CROOF(t4) classification. Where green roof is provided within 6m of the boundary, the structural roof deck must be classified as BROOF(t4) and it is recommended that the depth of growing layer should be a minimum of 80mm, and the organic content should not exceed 50% (as stated in DCLG guidance on “fire performance of green roofs and walls”).

Compartment walls (i.e., party walls, staircases, technical shafts, lift core) will meet the underside of the roof covering with fire-stopping to maintain the continuity of fire resistance and be continued across any eaves. Fire stopping will meet the fire rating of the compartment wall (EI 60).

To reduce the risk of fire spread over the roof from one compartment to another, a 1500mm wide zone of the roof (i.e., mansard roof), either side of the wall, will have a covering classified as BROOF(t4), on a substrate of a material rated class A2-s3, d2 or better.

External elements within 1m of the title boundary (i.e., party walls to East/West façades) should be provided with fire resisting construction achieving 60 minutes from both sides (structural, integrity & insulation).

Where facades face onto roadways, the relevant boundary may be extended to the centreline of the road, as future development is considered unlikely.

The external envelope of the building should not contribute to undue fire spread from one part of a building to another. This will be achieved by complying with Building Regulation ADB Vol 2 Requirement B4. The fire spread risk to property boundaries will be detailed in the fire strategy report for building control approval, albeit the large separation distances to the North/south façades mean that external fire spread challenges are not envisaged.

4.4 Suitable means of escape and evacuation strategy for all building users

4.4.1 Evacuation strategy:

The Fire strategy is based on a simultaneous evacuation on confirmed fire.

Simultaneous evacuation of the building will be triggered on:

- Actuation of two different smoke detectors (coincidence smoke detection) or,
- Actuation of a single heat detector, or
- Actuation of a single manual call point, or
- Running out of the 5-min investigation period.

4.4.2 Occupancy calculations:

The building will accommodate people of 2(b) residential (other) purpose group (according to ADB Volume 2), who will be distributed as follows:

LEVEL	NB OF BEDROOMS	OCCUPANCY PER FLOOR
LOWER GROUND FLOOR	10	20 people
GROUND FLOOR	6	12 people
FIRST FLOOR	9	18 people
SECOND FLOOR	9	18 people
THIRD FLOOR	9	18 people
TOTAL BUILDING OCCUPANCY: 43 bedrooms - up to 86 guests		

Table 1: Occupancy assessment

Assuming that each hotel bedroom can be occupied by 2 persons, and that 4 staff members are present on site during the day, a total occupant density up to **90 people** can be expected in the building at the same time. The means of egress will be designed to accommodate this occupancy.

4.4.3 Travel distances:

LOCATION	MAXIMUM TRAVEL DISTANCES	
	Travel in one direction	Travel in more than 1 direction
WITHIN BEDROOMS	9m	18m
IN CORRIDORS	9m	35m
ELSEWHERE	18m	35m

Table 2: Travel distance recommendations

Travel distances within premises will comply with standard guidance.

4.4.4 Escape stairs

The building is provided with two 60-min-protected stairs, remotely located at both ends of the corridor, used for escape. An additional central staircase, in a 30 min protected enclosure, serves all floors. It is an accommodation stair that does not require the same level of protection as the escape stairs but, combined

with the provision of protected corridors, it will effectively maintain the floor compartmentation of the building.

Both escape stairs terminate at ground level and are fire separated from basement stairs.

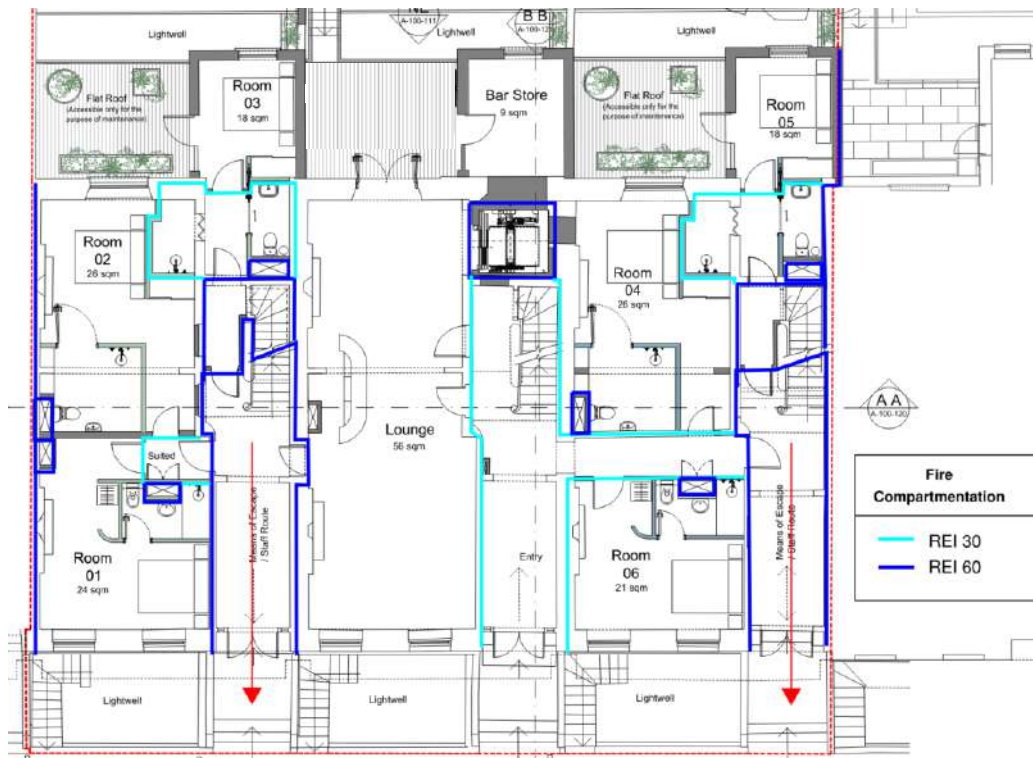


Figure 5: Ground Floor plan

Escape stairs will provide a minimum of 1m-clear width for escape, to accommodate the cumulated floor occupancy. The portions of stair serving the topmost floor and lower ground floor don't cumulate occupancy and can be reduced to 850mm clear width. Widths may need to be increased to meet guidance in Approved Document M.

Based on the proposed clear width of escape stairs (1m clear width on all intermediate floors), each escape stair has the capacity to evacuate 230 people, resulting in a combined evacuation capacity for the building (with both stairs) of 460 people, while only 90 people may be present in the building simultaneously. Therefore, the stairs' capacity is well beyond the building occupancy and will ensure a very fluent and timely evacuation.

4.4.5 Means of escape for the disabled

The existing hotel is not provided with any specific accessibility features. As part of the new works, three accessible bedrooms will be created, an evacuation lift and three disabled refuges on each storey will be provided, which consists in a vast improvement over the current arrangements.

Evacuation lift

The building is provided with a single lift core that will contain an evacuation lift in line with the London Plan Policy D5(B5). The intention is to design the evacuation lift in compliance with Annex G of BS 9999.

The hotel will be managed 24/7 by a concierge. It is assumed that staff presence may be reduced to one person at night. To allow this person to conduct efficient safety actions in case of fire in the premises (call the Fire Brigade, fight the fire or assist occupants), the lift will be designed to operate on automatic mode, without the assistance of a trained staff.

Capacity assessment:

All floors of the building are accessible to people with mobility restrictions via the lift which will be sized to accommodate wheelchairs. Although there will be no disabled bedrooms provided on the upper levels (3 DDA bedrooms are incorporated in the scheme: two located on GF and one on LGF), people with disabilities (visual impairments, mobility restrictions, etc.) can still be present in the premises (visitors) and need to be able to evacuate safely.

Based on the disabled occupancy, it has been assumed the simultaneous presence of 3 wheelchairs in the building (in DDA bedrooms) plus 1 disabled visitor across the 3 upper floors. The 2 disabled occupants on Ground floor will not use the evacuation lift, leaving 2 people in need to use the lift (on LGF and on upper floor).

As confirmed by the accompanying Accessibility Statement prepared by City Planning, the evacuation lift will have dimensions of 1100mm wide by 1400mm deep. This is sufficient for a single wheelchair user with an accompanying person and will also benefit ambulant disabled people. As the lift can be used by one wheelchair at a time, the lift will have to perform 2 round trips to evacuate disabled occupants which is considered reasonable. This is also compatible with the emergency power supply duration allowed for (60-minutes).

Evacuation strategy:

The evacuation strategy for disabled occupants is primarily via the evacuation lift.

The evacuation lift will be centrally located on the floor plate, implemented in a 60-min fire rated lift shaft. The protected corridor acts as a protected lobby for the evacuation lift on all levels below/above ground floor. A refuge space is provided in front of the evacuation lift and will contain a communication system that links back to the main fire panel area within the reception space. This refuge area is located in such manner that it does not obstruct escape routes.

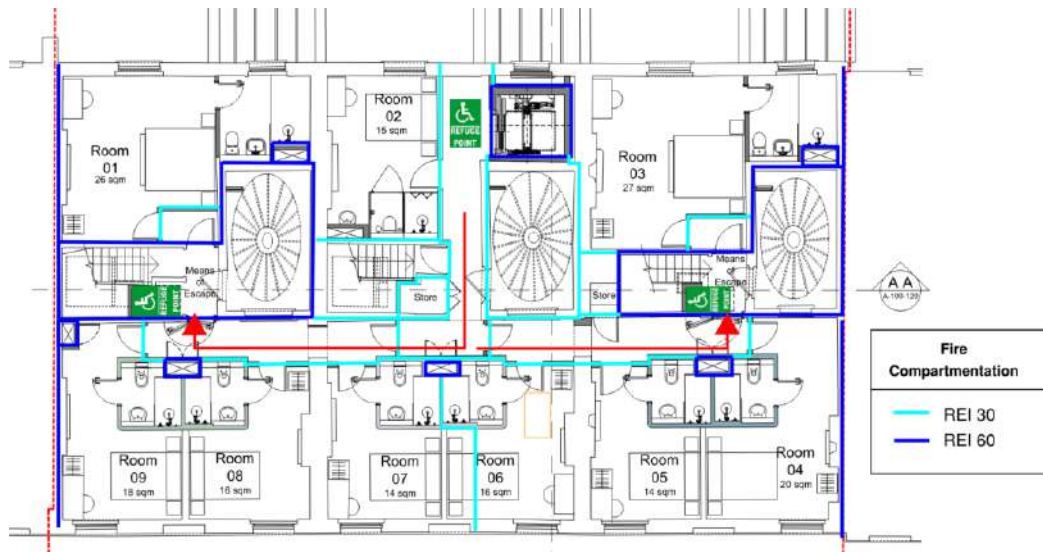


Figure 6: Typical upper floor layout

Secondary power supply for the lift will be designed to ensure it remains usable throughout the time required for evacuation.

The evacuation lift will be programmed to work on automatic mode in order to be operated by occupants without any trained assistance. The lift should switch to automatic evacuation mode on “confirmed fire”, mains power failure or manual call point activation. The automatic evacuation procedure will be based on the safety rules described in the 2019 DRAFT prEN 81-76 “Safety rules for the construction and installation of lifts – Part 76: evacuation of persons with disabilities using lifts” and will be detailed in the fire strategy report for building control approval.

In the event of the lift being unavailable:

On ground floor, the evacuation lift opens into the reception/lounge area, which constitutes a potential fire ignition location. This configuration is deemed acceptable because:

- *If a fire were to ignite at reception, it will be noticed and controlled by staff members who are always present in this space.*
- *If the fire is out of control and the evacuation lift is unusable, disabled occupants will make their way to the disabled refuges in the protected stairs and wait for instructions/assistance.*

The following scenario of evacuation will apply when the evacuation lift is unavailable:

If the evacuation lift fails to arrive at a landing or access to it is obstructed by the fire or during a maintenance operation, it will be necessary to use a stairway and the disabled occupant should travel to the nearest refuge area located in the protected escape stair. A communication system is provided at each storey of the escape stairs to enable a two-way speech between the refuge area and the fire panel/staff in reception.

- a. If the disabled occupant is present on upper floors, a member of staff will assist the evacuation of this occupant down the stair with an evacuation chair.
- b. If the disabled occupant is present on Lower Ground Floor, he will be redirected by staff to the West escape stair, where a stair lift is provided, with dual power supply, in order to self-evacuate towards Ground Floor. The LGF DDA room is located next to this stair lift.

Disabled refuges

Disabled refuges are provided on each level below/above ground floor, into the protected escape stairs and in front of the evacuation lift (in protected corridor), resulting in 3 disabled refuges per floor.

Each refuge area will be provided with means to alert the reception of the presence of persons requiring assistance. This will be in the form of outstations as recommended under BS 5839-9. The required dimensions for disabled refuge are 1400mm x 900mm to comply with Building Regulations and this will be provided to all refuge spaces up to 1st floor.

On 2nd and 3rd floor, the disabled refuge located in the Eastern escape stair cannot achieve these dimensions due to the existing condition and heritage significance of the stair. Consequently, the disabled refuge at this location is proposed to have reduced dimensions of 760mm x 1300mm in order to accommodate most of the wheelchair's designs.

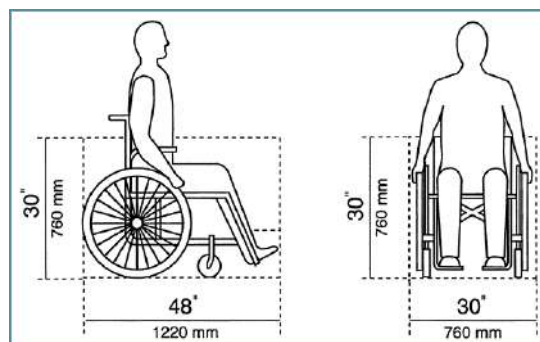


Figure 7: Typical wheelchair dimensions

Although this refuge on Levels 2 and 3, will not be fully compliant with Building Regulations in terms of dimensions, this is deemed acceptable as it constitutes a major improvement to the current disabled evacuation strategy (provision of new refuges and a new evacuation lift), and the building is already provided with two other fully compliant disabled refuges on Levels 2 and 3 while the floor has a very low occupancy (below 20 people).

Due to the presence of steps after the final exits, sufficient space for wheelchairs is also provided in the entrance lobbies forming part of the protected stair enclosures (no intercommunication system required). As the entrances are 2m wide, the refuge spaces will not reduce the width below the required escape width (850mm).

Fire safety management

The building management plan will include an evacuation lift management plan which sets out how the evacuation lift will be operated in an emergency.

Fire training must be provided for staff members to be able to assist evacuation and provide instructions to people with mobility restrictions on the procedure of evacuation, during the day and night:

- *Instructions on the use of the evacuation lift,*
- *information on the refuge area locations and the communication system.*
- *Location and use of evacuation chairs.*

Such fire information (listed above) must be given to all new guests and visitors with disabilities upon their arrival.

The following evacuation lift features should be checked regularly and maintained by the building management team:

- *Intercommunication systems in disabled refuges.*
- *Exit signage and evacuation plans in bedrooms.*
- *Evacuation procedures displayed.*
- *Unobstructed entry into lift car.*

Fire safety signage

Appropriate signage must be implemented in all bedrooms and in disabled refuges as detailed below.

Each bedroom will be provided with an evacuation plan of the floor and clear indications on what to do in case of fire (usage of evacuation lift for the disabled occupants and stairs for other occupants).

Each disabled refuge will contain a plan and instructions specifically targeted at disabled people that explain their evacuation process upon fire alarm actuation (i.e., make your way to the evacuation lift, and call the lift to evacuate autonomously. In case the lift does not arrive, use the telephone to call the reception on GF and make them aware of your presence in the refuge, wait for further instruction. In the absence of response and/or “unavailable” sign is indicated above the lift, make your way to disabled refuges in escape stairs and wait for assistance).

4.5 Robust evacuation strategy which can be periodically updated

The client/estate management team will ensure fire risk assessments are carried out at least annually and that the evacuation strategy plan is clearly communicated to all occupants and periodically reviewed, updated and published as appropriate.

Client/estate management team to seek fire consultation and fire strategy review/update in the case of significant future modifications in the building (no 24/7 presence of site, change of use, etc).

4.6 Suitable access and equipment for firefighting

Internal Fire Brigade access will be via the two protected escape stairs. The main fire panel will be located in the reception at ground floor level.

A dry riser system will be installed in the building. The dry riser inlet shall be visible and within 18m of the appliance parking position. Therefore, the inlet valve will be located at the entrance of one of the escape stairs along Bedford Place. Outlet valves will be provided within the escape stair at each storey. Any point in the building will be within 45m from either a fire main's outlet in the protected staircase or the vehicle attendance point (on Bedford Place), in compliance with ADB Vol 2.

5 Conclusions

It is a combination of all of the fire protection measures within the building that come together to constitute a robust fire strategy: low building height, fire detection to alert occupants, 24/7 presence on site to investigate alarm signals and call to the fire service, fire safety management plans, alternative means of escape, high stair capacity, compartmentation to limit fire spread and growth; providing protected common corridors to prevent smoke impacting means of escape and fire-fighting operations.

The above assessment and measures demonstrate that the Bedford Place hotel scheme complies with the requirements of the London Plan Policy D12(A) and may be considered acceptable with regard to fire safety planning.