

NORTHUMBERLAND DEVELOPMENT PROJECT **HOTEL**

S73 APPLICATION

FIRE STATEMENT



1 INTRODUCTION

This Fire Statement has been produced on behalf of Tottenham Hotspur Property Company Limited (“THFC”) (hereafter referred to as the ‘the Applicant’) to accompany the Section 73 application under the Town and Country Planning Act 1990 (as amended), following the grant of planning permission for the Northumberland Park Development Project ('NDP') ('the site') on 15 April 2016 (LPA ref HGY/2015/3000).

The application proposes amendments focussed on Plot 3 ('Hotel'), as part of the wider Tottenham Hotspur Stadium development in North London. The changes to the Plot 3 hotel building relate to:

- Changes to the building form and layout;
- Increase to the height of the building from 23 to 29 storeys; and,
- An increase in the site wide hotel floorspace to 16,132 sq.m.

As the site is located in the London Borough of Haringey, its planning application is subject to the London Plan 2021, i.e. the statutory Spatial Development Strategy for Greater London. The London Plan 2021 is the statutory Spatial Development Strategy for Greater London prepared by the Mayor of London (“the Mayor”) in accordance with the Greater London Authority Act 1999 (as amended) (“the GLA Act”) and associated regulations.

In support of the London Plan 2021, the GLA released a consolidated guidance document ‘London Plan Guidance – Fire Safety’ for public consultation in February 2022 to outline the details required to adhere to Policies D5 and D12. The final, formal guidance document is yet to be released, with the public consultation closed and responses currently being considered by the GLA at the time of issuing this Fire Statement. However, the Fire Statement structure largely follows Appendix 3 Template Form contained within this guidance.

The exhaustiveness and definitiveness of the statement is commensurate with the nature of the planning application submitted. The aim of this document is to exemplify how the development plans to meet the fire safety requirements set out in the London Plan – specifically Policies D5 and D12 which are focused on fire safety. A robust framework known as the Qualitative Design Review (QDR) process as outlined with PD7974 should be used to engage with the Building Control Body (Haringey Building Control) and the London Fire Brigade (LFB) throughout design development, enabling regular feedback that will be incorporated into the design.

This document does not constitute the detailed fire strategy developed under the Building Regulations 2010 (as amended), which has been submitted separately within the design process. However, this Fire Statement evidences the provisions made for the safety of occupants as well as the provision of suitable access and provisions for firefighting in light of the London Plan’s fire safety policy requirements and the rationale for these measures.

In December 2022, the government published a public consultation recommending a second stair for buildings over 30 m. The proposed amendments therefore introduce two means of escape throughout the building, and notably to the residential portion of the building.

Regular consultations with the Building Control Body are being held during the design stages ensuring clarity and agreement of the fire strategy by all necessary stakeholders. Initial engagements with the Health and Safety Executive and the London Fire Brigade are also to be considered in the design.

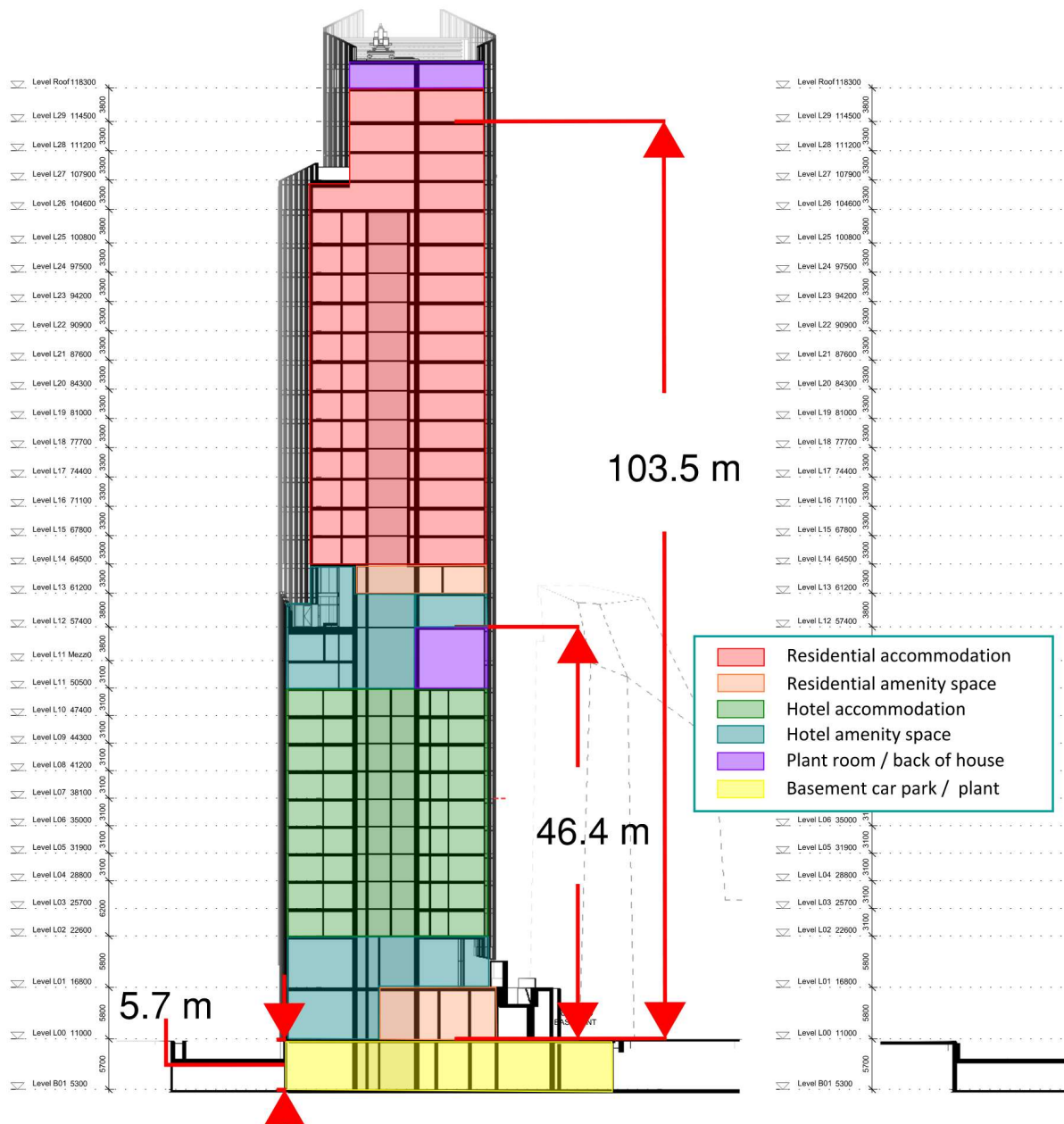


Figure 1: Section of the proposed hotel building



1.1 Competency and Quality Assurance Record

The London Plan Policy D12B notes that the fire statement should be produced by someone who is third-party independent and suitably qualified. This should be a qualified engineer with relevant experience in fire safety, such as a Chartered Engineer registered with the Engineering Council by the Institution of Fire Engineers or equivalent. In line with Policy D12B of the London Plan 2021, a suitably qualified Chartered Engineer has been involved in the production of this document. The fire engineering design team responsible to produce this document is shown below. The table below also demonstrates OFR's three tier quality assurance process.

Author	Reviewer	Approver
Chloe Harrop	Liam Caddy	Stewart Dabin
MEng (Hons)	BEng (Hons) MIET AIFireE	BEng CEng MIFireE

2 SITE ADDRESS AND DESCRIPTION OF DEVELOPMENT

The site is located in the London Borough of Haringey at the Tottenham Hotspur Stadium, 748 High Road, Tottenham, London, N17 0AP.

The NDP permission granted consent for: full planning permission for Plot 1 (The Stadium), Plot 2 (The Tottenham Experience) and Plot 3 (Hotel); and outline planning permission for Plot 4 (The Extreme Sports Building), Plot 5 (The Residential Buildings and Flexible B1/D1 Space) and Plot 6 (The Community Health Building). This S73 Application proposes amendments on Plot 3 which is located to the south-west of the new Tottenham Hotspur Stadium on the junction of Park Lane and High Road. It is bound by the stadium to the north; two temporary five a-side football pitches and events space to the east (granted planning permission in July 2022 (HGY/2022/0167)); Park Lane to the south; and the Tottenham Experience building to the west.

The current design proposals for Plot 3 hotel consists of hotel spaces between Ground and Level 12, and residential units and ancillary spaces spanning from Level 13 to Level 29, plus a top storey solely for plant use. There are four primary stairs serving across the building, with two stairs serving the hotel portion of the building, and two separate stairs serving the residential portion of the building. Three of these stairs will serve down to the shared landlord plant and ancillary spaces at basement level, which includes a car park, and one additional escape stair will be provided which solely serves this plant and ancillary level accessed from L01 off the podium.

The plant and ancillary from the hotel and residential demises have an interface on ground level, where amenity spaces (which act as the respective entrance lobbies for the respective demises) gives access to various spaces on the ground floor areas through common corridors. However, the evacuation of each block is completely independent from one another, as the stairs have separate discharge routes at the ground floor.



The height of the building is 103.4 m, as measured from the ground level to the floor level of the topmost occupied storey, i.e., Level 29, as the top storey is a plant only roof terrace. The hotel levels of the building equate to a height of 46.4m, as measured from the ground level to the floor of Level 12. The basement also has a depth of 5.7m. These are as illustrated in Figure 1.

Table 1 presents a description summary of the development.

Table 1: Tower and Mansion Block Building Description

Floor	Description
Basement	Car Park Plant and Ancillary Bin Storage Energy Centre
Ground Floor	Hotel Lobby Residential Lobby Ancillary Lobby Deliveries Room Cool Storage Bin Storage Concierge Office Hotel and Amenity Staff Welfare WC Facilities
First Floor	Hotel Kitchen Bar/Café Hotel Dining Areas
Second to Twelfth Floor	Hotel Rooms Hotel Ancillary Amenities Plant
Thirteenth to Twenty-Ninth Floor	Residential Ancillary Amenity Residential Flats
Roof	Plant

3 DESIGN APPROACH AND METHODOLOGY

The design and construction of the building will seek to satisfy the functional requirements of Part B of Schedule 1 to the Building Regulations 2010 (including all amendments) [1], the Construction Design and Management Regulations 2015 (CDM) [2] and the operational fire safety requirements of the Regulatory Reform (Fire Safety) Order 2005 (RRO) [3].



3.1 Relevant Stakeholders

The client, principal design team members and approving bodies are made up of the following principal parties:

- Client – Tottenham Hotspur Property Company Limited (“THFC”);
- Architects – F3 Architects;
- MEP Engineers – Buro Happold;
- Structural and Civil Engineers – Buro Happold;
- Planning Consultant – QUOD;
- Approving Authority – Haringey Building Control; and,
- Local Fire and Rescue Service – London Fire Brigade.

3.2 Basis of Design

The design for residential areas follows the guidance of British Standard (BS) 9991:2015 [4], and for the commercial and ancillary areas the standard followed is BS 9999:2017 [5].

It should be noted that a draft BS 9991:2021 was released for comment in August 2021 and is currently under review by the BSI committee. This design follows the guidance of the current 2015 issue and includes enhancement such as evacuation lifts and lift lobbies in preparation for the potential changes in the updated standard. However, when the 2015 issue is formally superseded there may be some difference in the recommendations that may have an impact on the design of these buildings. To mitigate this risk, the design team is following a QDR (qualitative design review) process to demonstrate compliance with the Building Regulations in the absence of applicable guidance.

Fire engineering principles may be employed to support alternative solutions where strict adherence to the codes would conflict with the wider aspirations for the scheme. Departures from guidance of BS 9991:2015 are identified and alternative proposals are documented. In accordance with the fire safety engineering principles detailed in the PD 7974:2019 [6] codes of practice, all fire precautions are determined on the basis of there being one seat of fire.

Other stakeholder interests such as property protection and insurance requirements have not been communicated at this stage. Therefore, any such secondary objectives have not been considered directly. However, the features that are included for life safety required by Building Regulations, will contribute to some extent to business and property protection. Where not specifically stated, fire safety provisions should be specified and installed according to the current edition of relevant published guidance (in this instance, BS 9991:2015 or BS 9999:2017).

As part of the Regulatory Approvals process, the fire safety strategy will be subject to milestone reviews and regular meetings with the Building Control Body and engagements with the London Fire Brigade as part of the QDR process. Advice and feedback from these authorities will inform both, the building design: as is being submitted under this planning



application, and the fire strategy being developed in support of the Building Regulations application.

A separate Planning Gateway One Fire Form is being submitted alongside this Fire Statement, also produced by OFR Consultants.

4 BUILDING CONSTRUCTION

The hotel building will be constructed of traditional materials using a reinforced concrete frame.

This is a ‘relevant building’ as defined in Regulation 7(4) (as a building at least 18 m above ground level with more than one dwelling and a room for residential purposes), and therefore falls within the scope of Regulation 7(2) (of the Building Regulations) and will follow the associated external wall guidance. All materials which become part of the external wall, or specified attachment, of a relevant building must be of European Classification A2-s1, d0 or Class A1, as classified in accordance with BS EN 13501-1:2018 [7]. Regulation 7(3) sets out the external wall components which are exempt from these requirements.

The inset balconies within residential apartments are considered to be a specified attachment are required to meet the requirements of Regulation 7.

Whilst Regulation 7(3) states that the requirements do not apply to membranes, these have also been covered under 2020 amendment to Approved Document B: Volume 1 and it is recommended that membranes used as part of the external wall construction should achieve a minimum classification of European Class B-s3, d0.



5 MEANS OF ESCAPE

A high-level summary of means of escape provisions at the current stage of the design (Spatial Coordination - RIBA Stage 3) are presented below.

5.1 Overall Evacuation Strategy

The building comprises of three principal demises: the residential levels, the hotel levels, and the plant and ancillary areas within the basement (noting the additional areas of plant at ground, Level 11, and roof level).

The residential and hotel / basement plant & ancillary demises will be evacuated independently from each other, for example for a fire in the residential areas, the hotel and basement plant & ancillary areas will not evacuate and vice versa. This strategy is supported by compartmentation provided between the residential and hotel / basement plant and ancillary area demises, the performance of the compartment walls are outlined in Section 7.3. Any further plant and ancillary areas associated with each use will also form part of that demise's evacuation zone.

5.2 Residential

5.2.1 Evacuation Strategy

The evacuation strategy proposed for the residential accommodation is for a 'stay put' approach. This is where a stand-alone detection and alarm system is proposed within each residential apartment, with every apartment being evacuated independently – irrespective of a fire occurring in a neighbouring apartment, any other apartment within the building, or any other residential plant and ancillary accommodation / non-residential accommodation. This approach does not preclude a resident's ability to escape on/of their own free will if they choose to do so.

Further, any of these non-residential areas that form part of the residential demise i.e. those on Level 13, are all to operate under a simultaneous evacuation strategy triggering evacuation for all communal and ancillary areas within the residential demise, all other residential apartments can remain in place as per the 'stay put' principles outlined above.

5.2.2 Internal Planning of Flats

The layouts of the residential apartments are yet to be confirmed, however for conservatism it is assumed all apartments are to adopt an open plan layout. This is defined as having the main living space not separated from the dwelling entrance door.

Where, in this arrangement, the inner rooms which present a sleeping risk are typically accessed directly from the living space. Clause 9.7 of BS 9991:2015 provides the following guidance on open plan apartment arrangements:

- 2.25 m minimum ceiling height.
- Sprinkler protection.
- LD1 alarm and detection system.



- Cooking facilities to be located remote to the escape route (these are to be further assessed at a later design stage).
- Enclosed kitchens in apartments which are larger than 8 m x 4 m.

However, research has shown that, with the introduction of sprinkler protection and an LD1 alarm and detection system, open-plan flats with unenclosed kitchens perform better than those with an enclosed kitchen. This has been attributed to two factors: the quicker activation of the smoke detector in the living area rather than the slower activating heat detector in the kitchen, and the lesser density of the smoke due to the larger mixing volume.

In each apartment layout, when assessing the escape past a hob fire, the proposed solution will look to ensure that no developed fire could reasonably occur on the hob which would ever compromise an escaping occupant.

As part of this, the hobs are to be located away from the escape route such that a minimum distance that any occupant needs to pass the hob should typically be at least 1.8m plus a 0.85m assumed occupant width. For distances less than this, these are to be supported by the radiation assessments undertaken for the worst-case layouts where an occupant would need to pass within close proximity of the hob.

Additionally, in recognition to the LD1 detection coverage and sprinkler provision throughout the building, the total travel distance from any point of the flat (including inset balconies) to the entrance doors of the flat should be limited to 20 m as per BS 9991:2015. This is illustrated in Figure 2 for a typical residential level.

For the duplex levels it is noted that although these serve across two levels served by an internal stair, the internal arrangements here have level access escape into the common escape corridors from both levels of the duplex apartments. This is as illustrated in Figure 3 for one of the penthouse levels.

5.2.3 Residential Common Corridors

The residential common corridors / lift lobbies are to be provided with a mechanical smoke extract system to support the means of escape in these spaces. The intent of these systems will be to maintain tenable conditions in the common escape routes for both occupants and firefighters, as well as protecting the stairs from smoke ingress.

Smoke shaft locations across the common corridors are highlighted in Figure 2 to Figure 4 for a typical upper level, duplex level, and ancillary level, respectively (red for the mechanical outlet shafts and blue for the mechanical inlet shafts).

5.2.4 Residential Plant and Ancillary Areas

The proposed communal ancillary areas, specifically at Level 13, are served by two storey exits into the two respective stair cores serving across the residential levels.

However, at this level, the floorplate is split into two halves, and each have one exit from the respective areas. As such, standard design guidance states the occupancy capacity for each half of this floorplate should be limited to 60 people for these respective areas.

All exits from these spaces should have a minimum clear width of 850 mm and open in the direction of escape.

At this level, these corridors are also to be ventilated by the mechanical smoke ventilation system outlined in Section 5.2.3, supporting the means of escape in the common corridors / lift lobby.

The travel distances within these areas themselves are within the one and two directional travel distance limits of 26m and 65m (See Figure 4), respectively. This also doesn't include the travel distances in the common corridors and lift lobbies, as these are considered places of relative safety as this should be fire sterile and will be vented by the smoke ventilation levels similar to the residential apartment levels above.

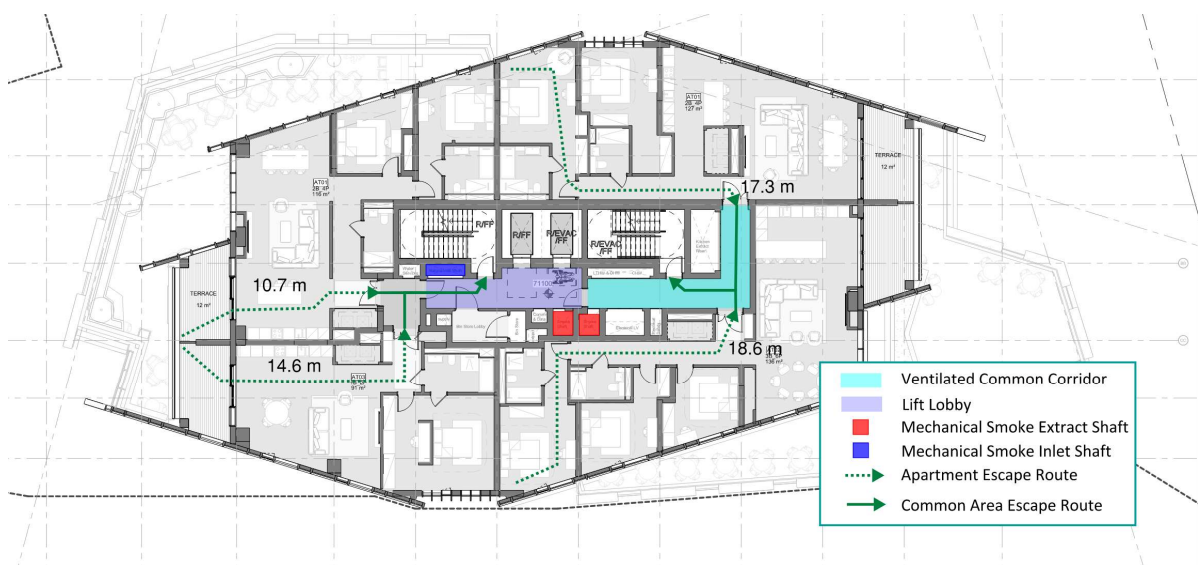


Figure 2: Typical Upper Floor – Residential Escape Provisions

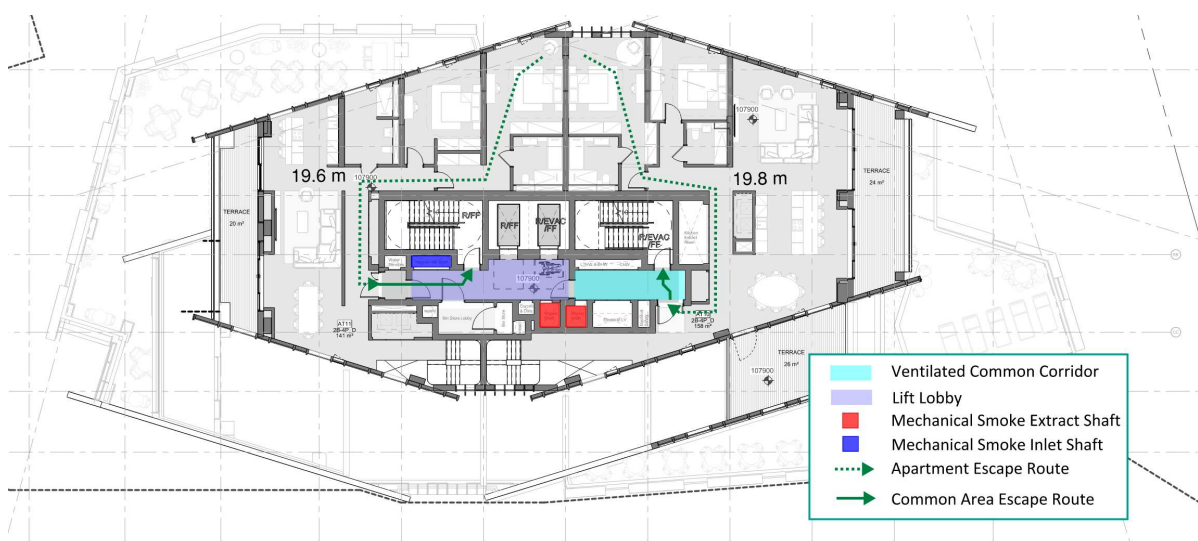


Figure 3: Duplex Floor – Residential Escape Provisions

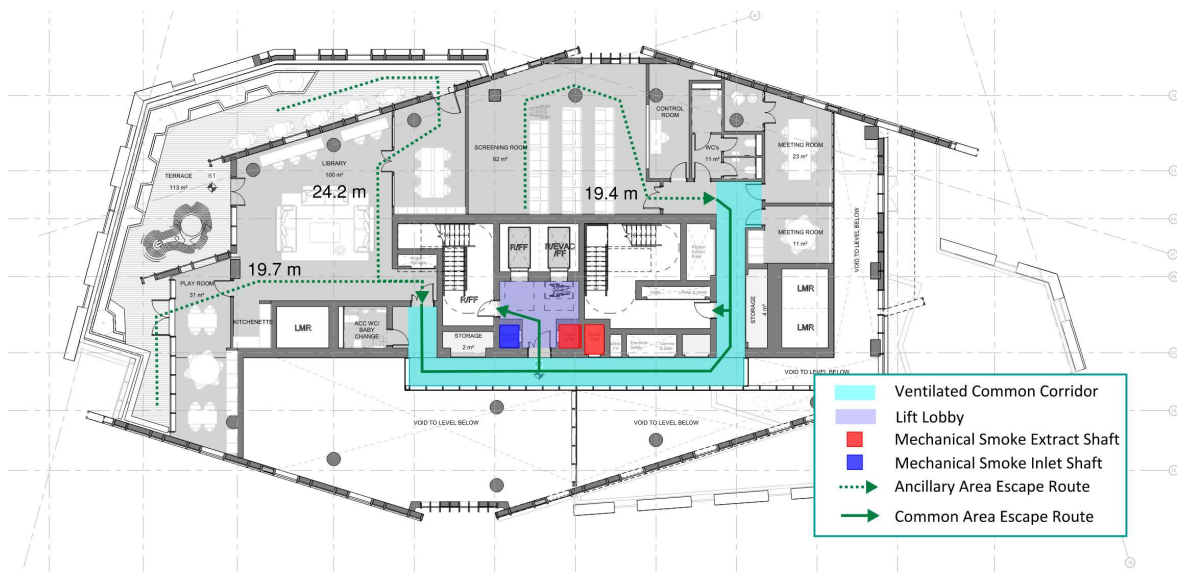


Figure 4: Level 13 – Residential Ancillary Escape Provisions

5.2.5 Vertical Escape

Following the recent DLUHC public consultation on two-stair designs for buildings over 30m in December 2022, the residential accommodation is afforded two vertical escape routes for each storey. Therefore, the residential section of the building is served by two stair cores.

These stair cores are both to function as a firefighting stair for the building and thus are to have a minimum clear width of 1,100mm. This width is suitable for both means of escape and firefighting purposes.

To support these means of escape proposals via these stairs, all common corridor / lift lobby arrangements are to be appropriately ventilated to support the travel distances from apartments. The performance of the smoke ventilation system will be demonstrated via CFD analysis (See Section 6.2).

For the ancillary areas at level 13, and assuming a minimum stair width per person of 3.9 mm per person for an A1 risk profile as appropriate for the use here, the stairs are shown to each have a capacity of 282 persons each. This is more than the horizontal egress capacity as outlined in section 5.2.4, which should be referred to for the limiting occupancies at this level.

5.2.6 Final Exits

The final means of escape from residential staircases should be by ways of a protected route to outside or direct discharge to outside. In addition, the final exit should discharge to a place of ultimate safety outside of the building, where escape is possible away from the confinements of the site.

The stairs discharge to the outside are via two independent protected routes at the ground floor level, one via a protected corridor, and another via the reception lobby. These routes are to be completely separated at ground level.

The stairs discharge route leading to the final exit at ground level should have the same standard of fire-resisting enclosure and lobby protection as the stair it serves.

On the upper floors of the building, the stairs are separated from the flats and amenity areas by a ventilated lobby. Therefore, a similar strategy shall be adopted on the ground floor, whereby the final exit routes will be separated from any room containing fire load by a ventilated lobby, this includes the lift lobby serving the firefighting/evacuation lifts at ground floor.

Furthermore, all risers other than life safety risers should not be accessed from the stair discharge routes.

This final exit routes from the stairs are as illustrated in Figure 5.

5.2.7 Basement Stair

In accessing the basement portion of the building, in line with guidance recommendations, only one of the residential stairs is to extend down to basement level. The basement portion of the stair should also be fully fire separated within the stair enclosure and be accessed by means of a fire resisting door (See Figure 5).

The lobby to the stair at basement level should also be mechanically vented, in line with guidance recommendations.

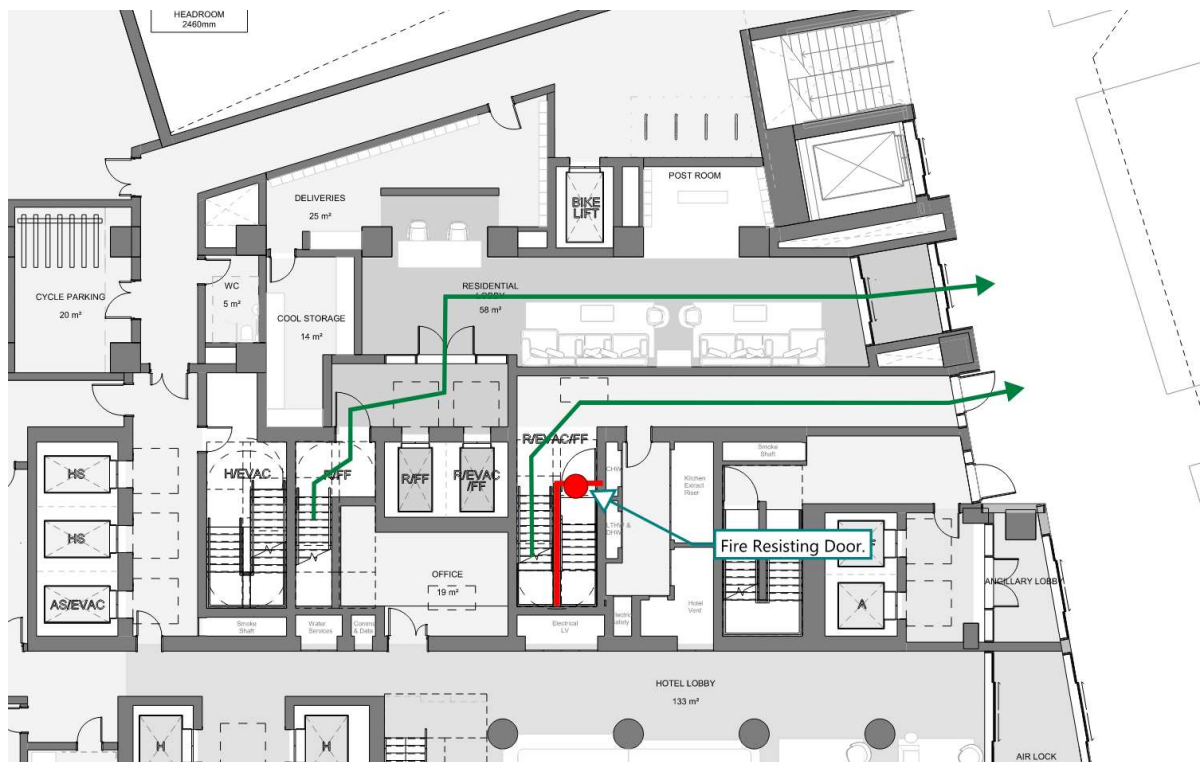


Figure 5: Ground floor residential stair discharge routes



5.2.8 Mobility Impaired Persons (MIP) Evacuation

To comply with the London plan, each lift core will be provided with a lift for evacuation purposes of people with impaired mobility in addition to the minimum required for firefighting purposes.

The evacuation lifts will be adequately protected so that there is a waiting area for those choosing to use the lift to escape. The waiting areas proposed will be protected ventilated lift lobbies.

CFD modelling will be carried out to demonstrate that tenable conditions can be maintained within these internal lobbies.

It is proposed to provide two combined firefighting / evacuation lifts serving the residential demise of the building in support of MIP egress. These can be used for evacuation purposes when not in operation by the fire service, and can be used by the fire service as they see fit on their arrival.

In summary, this should include:

- 2x Firefighting lifts – both to be designed and operate in accordance with BS EN 81-72.
 - One firefighting lift will be recalled in line with BS EN 81-73 upon ‘Fire Detection’, with the use of smoke detectors within protected common corridors / lift lobbies or firefighting shafts on any level, or when manually called by the attending fire and rescue service, prompting the lift to ground to fire service access level.
 - One firefighting lift will continue to be in operation during a fire event. The lifts are to be recalled in line with BS EN 81-73 upon ‘Fire Detection’, with the use of Heat Detectors adjacent to lift/s on each level or manually called by the attending fire and rescue service.

‘Evacuation lifts’ come with the expectation they require to be facilitated by an estate’s management team with suitably competent persons. However, based on the ‘stay put’ strategy being adopted, it would in this case be reasonable to; use either of the two combined firefighting / evacuation lifts, to allow those that have mobility impairment choosing to leave from a non-fire affected apartment to use these lifts. In such a case, these occupants also have the alternative choice to ‘stay put’.

Taking consideration to a case of a fire affected apartment where a mobility impaired occupant resides, it is proposed to allow them to seek refuge within a lift lobby whilst awaiting a lift being called. This is supported by the fire alarm and detection and mechanical ventilation provisions within the residential common corridors / lift lobbies, which are in place to ensure tenable conditions are maintained (See Sections 6.3.3 & 7.5.1).

Adequate information will be advised to be relayed to the residents, both ambulant and non-ambulant so that they are conversant with this evacuation procedure. It is important to also note, what defines mobility impairment may not necessarily be those in wheelchairs only, for example those that have visual impairment can also be expected to use the lifts.

The proposed lift provisions for the residential levels are as illustrated in Figure 6.



Figure 6: Stair core and lift arrangements, typical residential upper floor



5.3 Hotel

5.3.1 Evacuation Strategy

The hotel levels of the building are proposed to be evacuated simultaneously for a fire anywhere across the hotel demise, and for any detection anywhere across the basement plant and ancillary level.

5.3.2 Risk Profiles

BS 9999 outlines design limitations by specifying a risk profile, this is a combination of occupancy characteristics and the expected fire growth rate for a space with a specified use. A summary of the risk profiles in the building is shown in Table 2.

Table 2: Risk Profiles for Hotel Areas

Area	Occupancy Characteristic	Fire Growth Rate	Risk Profile
Hotel – Bedroom areas	Ciii – Sleeping risk	1	Ciii1 (Short term occupancy) ⁽¹⁾
Hotel Ancillary / Amenity Areas	B – Awake and unfamiliar	1	B1 ⁽¹⁾
Standard-Risk Rooms / Storage Areas	A – Awake and familiar	2	A2 ⁽¹⁾
Plant and High-Risk Rooms / Storage Areas	A – Awake and familiar	3	A3
Note (1) Sprinkler protection allows for a reduction in the fire growth rate by ‘1’ as permitted under BS 9999			

5.3.3 Horizontal Egress

The travel distance limits depend on the assigned risk profile. Table 3 summarises the travel distance limits for the varying areas within the hotel demise.

In BS 9999 limits are given for both ‘Actual’ and ‘Direct’ travel distances. When the fit-out layout is unknown direct travel distance should be measured, which is limited to approximately two thirds of the actual travel distance limit. Where travel distances exceed the ‘Direct’ distance in these cases, it should be acknowledged that the flexibility in the fit-out layouts will ultimately be limited to the ‘Actual’ travel distances.



Table 3 Travel Distances

Area	Risk Profile	One Direction Travel Distance Limit [m]	Two-Direction Travel Distance Limit [m]
Hotel – Bedroom areas	Ciii1 (Short term occupancy)	9 (Direct) 12 (Actual)	18 (Direct) 27 (Actual)
Hotel Ancillary / Amenity Areas	B1	16 (Direct) 24 (Actual)	40 (Direct) 60 (Actual)
Standard-Risk Rooms / Storage Areas	A2	15 (Direct) 22 (Actual)	37 (Direct) 55 (Actual)
Plant and High-Risk Rooms / Storage Areas	A3	12 (Direct) 18 (Actual)	30 (Direct) 45 (Actual)

The travel distances as illustrated in Figure 7 are in line with the above limits for a typical hotel level, and it will be ensured this is the case throughout all hotel levels.

5.3.4 Exit Widths

An exit width to be used as a means of escape should not be less than 850 mm in any scenario to enable non-discriminatory egress routes.

Recommendations within BS 9999 on door openings, the numbers and principles an escape route serves are governed by the following;

- Single exit door serving a room/route – limited occupancy to 60 people.
- Where more than one escape route is provided, the most favourable should be discounted.
- Inward opening exit door – limit occupancy to 60 people.

An exit capacity assessment will be undertaken across the various levels of the hotel, in line with the recommendations of BS 9999, to assess the required minimum width of storey exits and the supporting occupant capacities.

5.3.5 Vertical Escape

Occupants from all the upper floors of the hotel levels have access to 2 escape stairs, both sized 1100mm and lobbied at every level.

Table 13 of BS 9999 recommends a minimum stair width of 1.5 m/person when 10+ floors evacuate simultaneously (for both B1 and Ciii1 risk profiles of the hotel amenity and hotel apartments, respectively). Therefore, each stair has the capacity to hold 733 occupants, giving a total capacity of 1466 occupants.

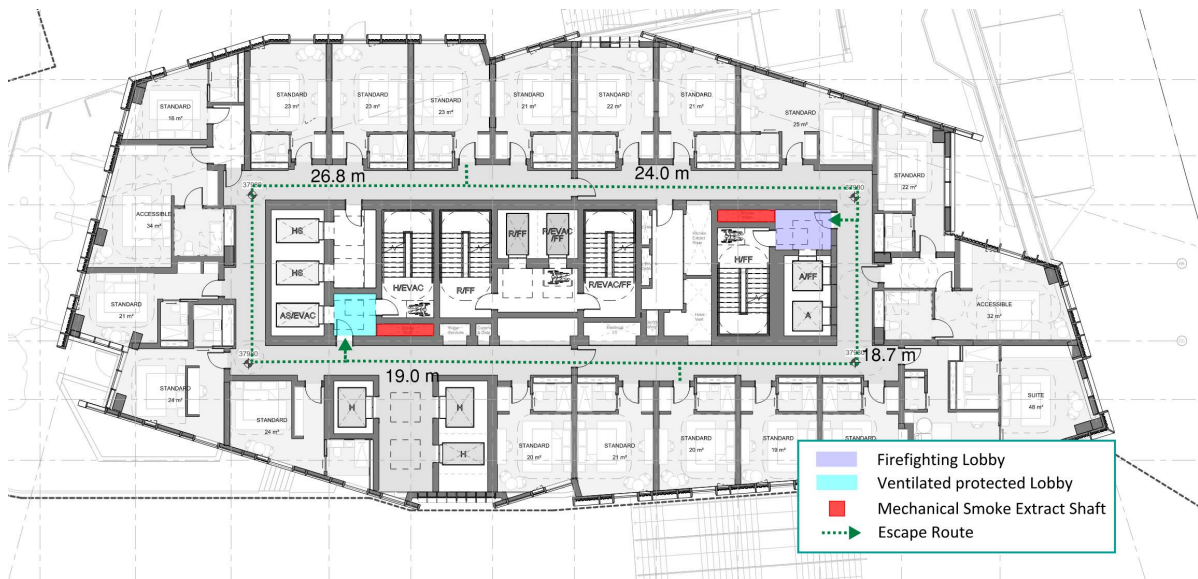


Figure 7: Typical Hotel Level– Travel Distances and Escapes

5.3.6 Final Exits

The final means of escape from the hotel staircases should be by ways of a protected route to outside or direct discharge to outside. In addition, the final exit should discharge to a place of ultimate safety outside of the building, where escape is possible away from the confinements of the site.

Both stairs discharge to the outside via a protected route, one at ground level, and one at Level 1 via the podium. As a minimum, the final exit routes should maintain the same width as the assumed stair (1100mm), including the doors, until a place of ultimate safety is reached.

The final exit from one of these stairs is also a firefighting access route. Therefore, the final exit corridor should have an increased width by a minimum of 500mm, i.e. the width of the stair plus an additional 500mm to facilitate firefighting operations.

5.3.7 MIP Evacuation

Each escape stair should be provided with a refuge point (1400 x 900 mm) which does not impede the escape route and is provided with an EVC in accordance with BS 5839-9 [8]. As per the London Plan, an evacuation lift should be provided to each lift core.

It is proposed to provide with two combined firefighting / evacuation lifts, one in the firefighting shaft, and a second off the other protected stair into a ventilated lobby to support this approach. These can be used for evacuation purposes when not in operation by the fire service, and can be used by the fire service as they see fit on their arrival.

In summary, this should include:

- 2x Firefighting lifts – both to be designed and operate in accordance with BS EN 81-72.
 - One firefighting lift will be recalled in line with BS EN 81-73 upon ‘Fire Detection’, with the use of smoke detectors within protected common corridors / lift lobbies or firefighting shafts on any level, or when manually called by the attending fire and rescue service, prompting the lift to ground to fire service access level.
 - One firefighting lift will continue to be in operation during a fire event. The lifts are to be recalled in line with BS EN 81-73 upon ‘Fire Detection’, with the use of Heat Detectors adjacent to lift/s on each level or manually called by the attending fire and rescue service.



Figure 8: Stair core and lift arrangements, typical hotel upper floor



5.4 Basement Plant / Ancillary Areas

5.4.1 Evacuation Strategy

The basement level of the building is proposed to be evacuated simultaneously for a fire anywhere across the basement demise, and for any detection anywhere across the hotel level.

5.4.2 Risk Profiles

BS 9999 outlines design limitations by specifying a risk profile, this is a combination of occupancy characteristics and the expected fire growth rate for a space with a specified use. A summary of the risk profiles in the building is shown in Table 4.

Table 4: Risk Profiles for Basement Plant & Ancillary areas

Area	Occupancy Characteristic	Fire Growth Rate	Risk Profile
Standard-Risk Rooms / Storage Areas	A – Awake and familiar	2	A2 ⁽¹⁾
Plant and High-Risk Rooms / Storage Areas	A – Awake and familiar	3	A3
Note (1) Sprinkler protection allows for a reduction in the fire growth rate by ‘1’ as permitted under BS 9999, i.e., the plant areas without suppression would have a high ‘3’ fire growth rate; with suppression this becomes a medium ‘2’ fire growth rate.			

5.4.3 Horizontal Egress

The travel distance limits depend on the assigned risk profile. Table 3 summarises the travel distance limits for the varying areas within the hotel demise.

In BS 9999 limits are given for both ‘Actual’ and ‘Direct’ travel distances. When the fit-out layout is unknown direct travel distance should be measured, which is limited to approximately two thirds of the actual travel distance limit. Where travel distances exceed the ‘Direct’ distance in these cases, it should be acknowledged that the flexibility in the fit-out layouts will ultimately be limited to the ‘Actual’ travel distances.



Table 5 Travel Distances

Area	Risk Profile	One Direction Travel Distance Limit [m]	Two-Direction Travel Distance Limit [m]
Standard-Risk Rooms / Storage Areas	A2	15 (Direct) 22 (Actual)	37 (Direct) 55 (Actual)
Plant and High-Risk Rooms / Storage Areas	A3	12 (Direct) 18 (Actual)	30 (Direct) 45 (Actual)

The travel distances as illustrated in Figure 9 are in line with the above limits for the basement level.

5.4.4 Exit Widths

An exit width to be used as a means of escape should not be less than 850 mm in any scenario to enable non-discriminatory egress routes.

Recommendations within BS 9999 on door openings, the numbers and principles an escape route serves are governed by the following;

- Single exit door serving a room/route – limited occupancy to 60 people.
- Where more than one escape route is provided, the most favourable should be discounted.
- Inward opening exit door – limit occupancy to 60 people.

An exit capacity assessment will be undertaken across the basement level, in line with the recommendations of BS 9999, to assess the required minimum width of storey exits and the supporting occupant capacities.

5.4.5 Vertical Escape

Occupants from all of the basement level have access to four escape stairs, all sized 1200mm (the minimum for upward travel).

Table 13 of BS 9999 recommends a minimum stair width of 5.4 mm/person when 1 floor is evacuating simultaneously (for and A3 risk profile for the plant and high risk ancillary at this level). Therefore, each stair has the capacity to hold 222 occupants, giving a total capacity of 444 occupants (as one stair still needs to be discounted given this is a single storey).

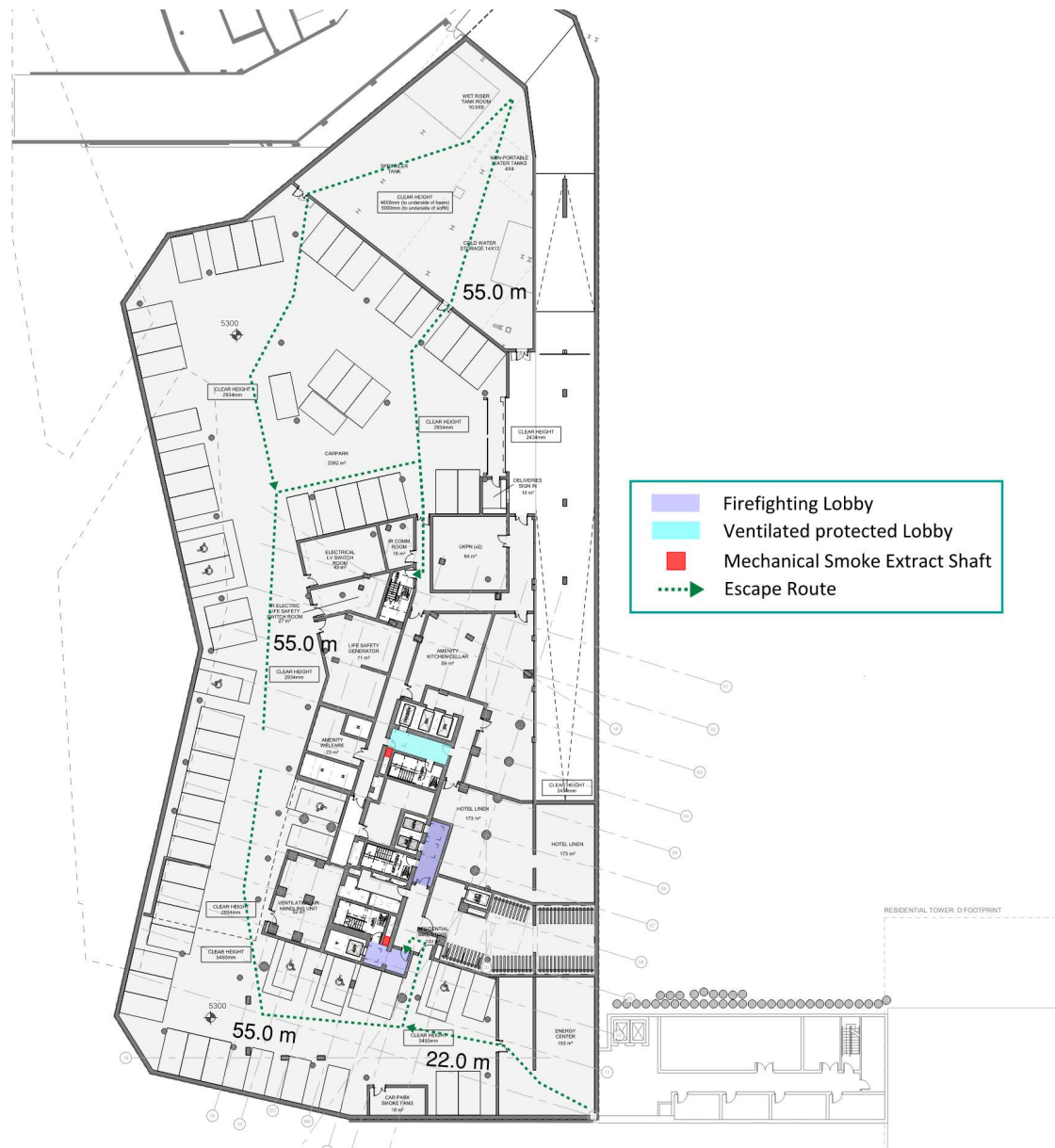


Figure 9: Basement – Travel Distances and Escape

5.4.6 Final Exits

The final means of escape from the basement staircases should be by ways of a protected route to outside or direct discharge to outside. In addition, the final exit should discharge directly to a place of ultimate safety outside of the building, where escape is possible away from the confinements of the site.

All four stairs discharge to the outside via a protected route, two at ground level (See Figure 10), and two at Level 1 via the podium (See Figure 11). As a minimum, the final exit routes should maintain the same width as the assumed stair (1200mm), including the doors, until a place of ultimate safety is reached.

Tottenham Hotspur Stadium, 748 High Road, Tottenham, London, N17 0AP

A merging flow assessment will be undertaken to assess the required exit width where the upward and downward portions of stairs meet at the final exit level with the stairs serving the above ground levels.

Where final exits from these stairs are also a firefighting access route, the final exit corridor should have an increased width by a minimum of 500mm, i.e. the width of the stair plus an additional 500mm to facilitate firefighting operations.

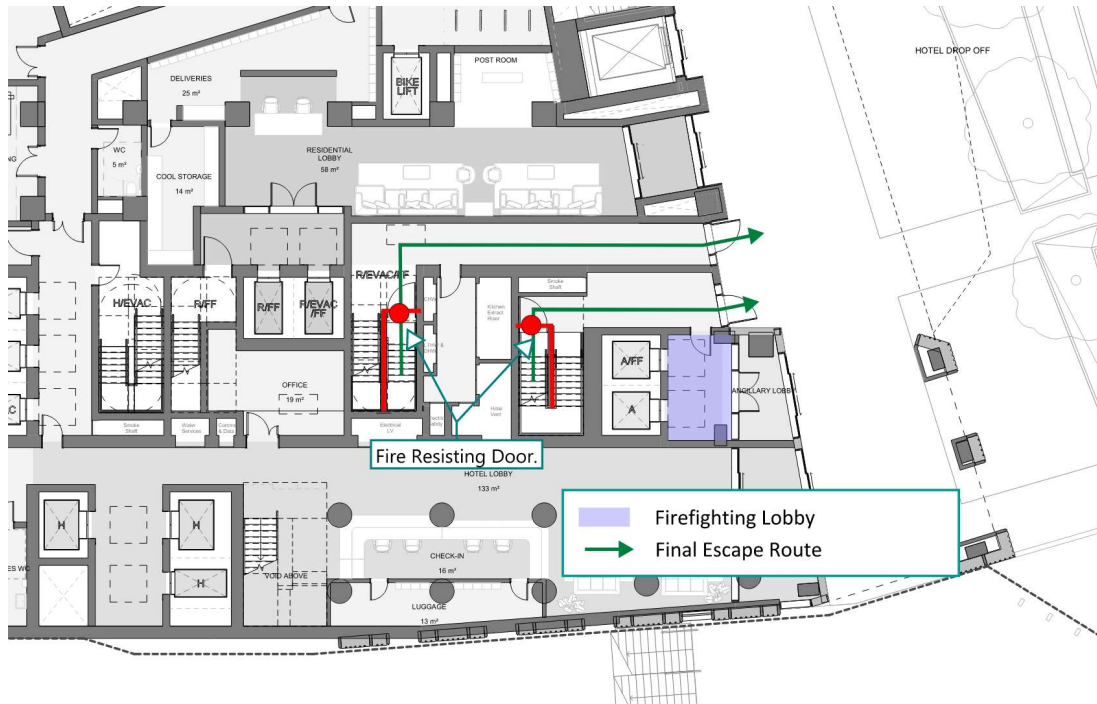


Figure 10: Ground floor basement plant and ancillary stair discharge routes

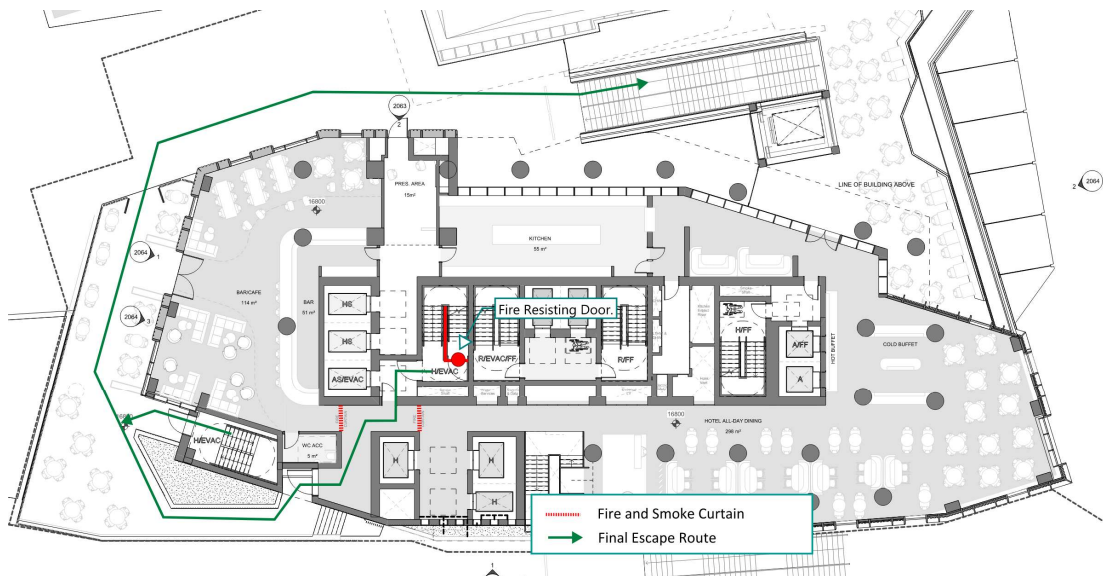


Figure 11: Level 1 basement plant and ancillary stair discharge routes

5.4.7 MIP Evacuation

Each escape stair should be provided with a refuge point (1400 x 900 mm) which does not impede the escape route and is provided with an EVC in accordance with BS 5839-9 [8]. As per the London Plan, an evacuation lift should be provided to each lift core.

It is proposed to provide four combined firefighting / evacuation lifts, including one from the firefighting shaft of the hotel, a second from the other protected stair of the hotel into a ventilated lobby, and a further two from the lifts serving the residential levels. These can be used for evacuation purposes when not in operation by the fire service, and can be used by the fire service as they see fit on their arrival.

In summary, this should include:

- 2x Firefighting lifts – both to be designed and operate in accordance with BS EN 81-72.
 - One firefighting lift will be recalled in line with BS EN 81-73 upon ‘Fire Detection’, with the use of smoke detectors within protected common corridors / lift lobbies or firefighting shafts on any level, or when manually called by the attending fire and rescue service, prompting the lift to ground to fire service access level.
 - One firefighting lift will continue to be in operation during a fire event. The lifts are to be recalled in line with BS EN 81-73 upon ‘Fire Detection’, with the use of Heat Detectors adjacent to lift/s on each level or manually called by the attending fire and rescue service.

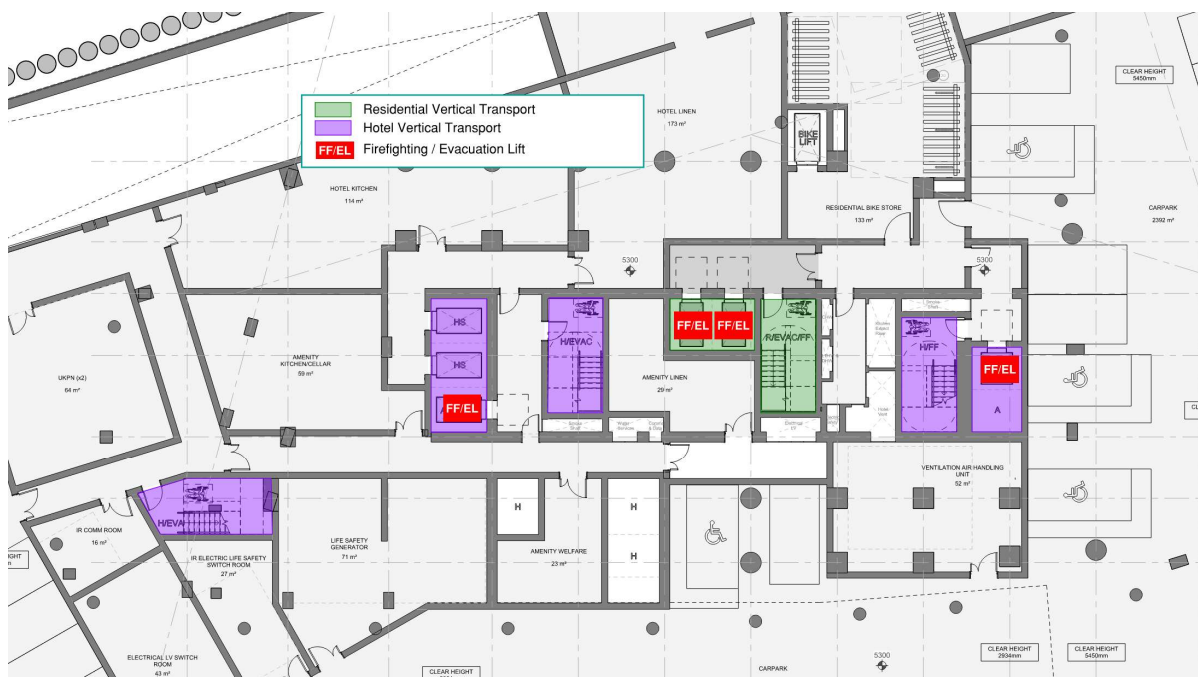


Figure 12: Stair core and lift arrangements, typical hotel upper floor



6 ACTIVE FIRE SAFETY MEASURES

Within the proposed development, a balance of active and passive fire safety systems will be incorporated to support and enable the life safety objectives agreed with the project stakeholders and required to demonstrate compliance with the Building Regulations 2010 (as amended).

The active fire protection measures within the development, such as detection & alarm system, mechanical smoke control systems, and sprinklers, will support the proposed evacuation strategy and the overall fire safety strategy of the building. The active fire protection measures proposed within the building are as outlined below.

6.1 Fire Detection and Alarm Systems

6.1.1 Residential Accommodation

The proposed fire alarm and detection system should be in accordance with BS 5839-6:2019+A1:2020 [9] for residential flats.

All residential apartments should be fitted with a Grade D1 Category LD1 fire alarm and detection system in accordance with BS 5839-6 (and an Automatic Water Fire Suppression System).

Smoke detectors installed in the common areas of the residential levels should activate the smoke control systems and, as such, should be provided with an L5 system in accordance with BS 5839-1:2017 [10].

The remaining common areas, ancillary and plant rooms to the residential demise are proposed to be provided with a Category L1 detection and alarm system in accordance with BS 5839-1 (this is above and beyond guidance recommendations for these spaces).

6.1.2 Non-Residential Areas

The hotel levels should be equipped throughout with a Category L1 detection and alarm system in accordance with BS 5839-1.

All plant and ancillary areas, specifically those within the basement, are also to be fitted throughout with Category L1 automatic fire detection and alarm system, as per BS 5839-1 (this is above and beyond guidance recommendations for these spaces).

6.1.3 Evacuation Alert Systems

An Evacuation Alert System (EAS) enables the Fire and Rescue Service to initiate operation of evacuation alert sounders within buildings according to the circumstances. The provision of an EAS is now a current recommendation in Approved Document B (ADB) in blocks of flats with storeys over 11 m. Therefore, an EAS will be provided to this building. The design and installation of EAS should be in accordance with BS 8629:2019 [11].



6.2 Residential Common Corridor Ventilation

A mechanical smoke extract system is provided within the common corridors and lift lobbies of all residential levels to support the means of escape from these levels, and to protect the stair / evacuation lift lobby from smoke ingress. The intent of these systems will be to maintain tenable conditions for the escape and firefighting phases.

The design and installation of these systems should be in accordance with BS 7346-8 [12]. A power supply in accordance with BS 8519 [13] should be provided to all fans, actuators and controls. The system should be provided with a duty/standby fan, which will operate automatically upon failure of the duty fan. Both fans should be in accordance with BS EN 12101-3 [14].

Further the smoke shaft will only be constructed of materials classified as A1 in accordance with BS EN 13501-1:2018 [7].

It should be noted that further analysis (typically computational fluid dynamics – CFD) should be undertaken to determine the required free area of the smoke shafts and mechanical extract rates necessary to maintain acceptable tenability levels in the event of fire.

In addition, a 1m² (free area) automatically openable vent will be located at the head of each of the residential stairs.

6.3 Mechanical Smoke Extract from Hotel Firefighting / Protected Ventilated Lobbies

The fire-fighting and protected lobbies serving the hotel stairs will be mechanically ventilated to protect these spaces from smoke ingress.

The system should comprise:

- A mechanical smoke extract shaft with openings into the fire-fighting lobby on every level; and,
- An automatic openable vent (AOV), with a minimum geometric free area of 1 m² at the head of the fire-fighting stair to provide inlet air.

The design and installation of the system should be in accordance with BS 7346-8. A power supply in accordance with BS 8519 should be provided to all fans, actuators and controls. The system should be provided with a standby fan, which will operate automatically upon failure of the duty fan. Both fans should be in accordance with BS EN 12101-3.

6.4 Automatic Openable Vent at head of stairs

An automatic openable vent (AOV) with a free area of 1 m² will be provided at the head of all firefighting stairs in accordance with BS EN 12101-2:2017 [15]. The vents should open automatically upon smoke detection within the stair lobbies and/or via break glass at firefighter access level to the shaft.



All connections between the smoke detection, vent control panels and actuator mechanisms should be within the fire-fighting shafts or control room. Where any part of the control mechanism is powered by electricity, a secondary power supply should be provided.

6.5 Basement Smoke Clearance

As the basement floor area is greater than 200m² it should be provided with a system for heat and smoke control for firefighting purposes. Given the location of the building above the basement, a natural ventilation system is not feasible. Rather, a mechanical smoke and heat ventilation system is to be provided, meeting a minimum of 10 air changes per hour based on the largest compartment and will serve all basement compartments. The system should also be designed such that:

- Fans intended to exhaust hot gasses should be tested in accordance with BS EN 12101-3 in verifying suitability for handling gas temperatures of 300°C for not less than 60 minutes;
- Come into operation automatically on activation of the sprinkler system and/or confirmed detection from alarm systems in the basement, including the provision for replacement air;
- The system should have an independent power supply, designed to operate in the event of failure of the main power supply;
- The ductwork should be a fire resisting duct system in accordance with BS EN 1366-2:2015 [16], maintaining at least 90% of the cross-sectional area of the duct. The fire resistance should not be less than 60 minutes or equivalent to the fire resistance rating of any compartment boundary through which it passes – whichever is greater; and,
- All wiring associated with the fans should be in accordance with BS 8519:2020.

6.6 Sprinkler Systems

6.6.1 Residential

Given the building is over 11m in height, all residential areas (except stairs and common corridors) are to be sprinkler protected by a system designed and installed in accordance with per BS 9251:2021 [17]. This system shall meet the requirements of a Category 4 system and provide coverage to all the residential apartments across the building.

The ancillary areas to the residential demise are proposed to be provided with the commercial sprinkler system designed to BS EN 12845:2015+A1:2019 [18]. The system should be designed to a minimum classification of OH1 hazard group as it is expected that this will accommodate the typical uses expected in the ancillary areas to the residential areas, and in consideration that these areas will exceed 100m². Further, as a BS EN 12845 system is being installed for certain areas, OFR recommend it be used in all non-residential areas regardless of size. This provides consistency throughout the building.



6.6.2 Hotel

A commercial sprinkler system meeting the requirements for an OH1 hazard group is to be installed in line with BS EN 12845 to protect all hotel levels of the building.

The hotel system will be served off the same sprinkler tank as for the commercial system in the basement (noting these areas require the increased tank size based on the expected hazard group expectation – See Section 6.6.3).

6.6.3 Basement Plant and Ancillary

A commercial sprinkler system meeting the requirements for an HHP3 hazard group is to be installed in line with BS EN 12845 to protect the basement plant and ancillary areas of the building.

This increased category specification is due to consideration of the car park within the basement, and as advised when following LPC rules (to be confirmed by the Client following directions of insurers).

6.7 Secondary Power Supply

To reduce the risk of loss of electrical supply to fire protections systems that are required to operate continuously during a fire, a secondary power supply should be provided. This should be of sufficient capacity to maintain supply to all life safety and firefighting installations.

Both primary and life safety supplies will be taken from different ways on the same transformer. Both supplies shall run internal and routed diverse to their point of use in ducts and cable trays. Emergency power supplies are necessary for all active fire safety systems, these should be designed in accordance with BS 8519.

6.8 Emergency Lighting and Signage

Emergency lighting will be provided in accordance with Section 44.2 of BS 9991 and the system will follow the recommendations set out in BS 5266-1 [19].

Escape and other fire safety signage are to be provided in accordance with recommendations of BS 5499-4 [20].

To assist the fire service to identify each floor in a block of flats with a top storey more than 11m above ground floor level, floor identification signs and flat indicator signs are to be provided in accordance with the recommendations in Approved Document B (Volume 1) [2019, Incorp 2020 and 2022] – Dwellinghouses [21] as best practise.

Firefighting lifts continuing to operate in supporting MIP egress are to be appropriately signed in recognising that the lift will continue to be in operation (See Sections 5.2.8, 0 & 5.4.6).



6.9 Maintenance

All fire safety systems need to be inspected and maintained based on maintenance recommendations in BS 9999 and the relevant system-specific standards, which is to be covered by the management plan for the building.



7 PASSIVE FIRE SAFETY MEASURES

The passive fire protection measures within the development, such as lining classifications, compartmentation, and external wall construction, will also support the proposed evacuation strategy and the overall fire safety strategy of the building. The passive fire protection measures proposed within the building are as outlined below.

7.1 Linings

The wall and ceiling linings should satisfy the performance requirements in accordance with Table 33 of BS 9999:2017 and the information provided in section 20.1 of BS 9991:2015.

7.2 Elements of Structure

As the buildings are above 30m in height (measured from the lowest ground floor level to the top finished habitable floor level), elements of structure should be a minimum of R120 (R – load bearing capacity).

As a hotel and residential building which exceeds 15 storeys this structure should be considered under a Consequence Class 3 as per Approved Document A: Structure (ADA) [22]. ADA recommends a systematic risk assessment of the building to be undertaken. As such a QDR probabilistic Risk Assessment (time equivalence) should be undertaken considering fire-associated risks to structural elements to inform the Qualitative Design Review process.

7.3 Compartmentation and Fire Resisting Construction

Internal compartmentation and fire-resisting construction recommendations for the development are proposed to follow guidance within BS 9991 (and BS 9999 where this is more onerous) in residential accommodation, and BS 9999 for non-residential areas.

It is also noted that all floors are to be designed as compartment floors within the building. Specifically noting that any connections between the residential, hotel, and basement plant and ancillary areas are to be fully fire separated as 120-minute fire rated compartments to support the evacuation strategy for the building (See Section 5.1).

7.4 External Fire Spread

As a relevant building, the external walls of this building should be constructed to Class A2-s1, d0 or Class A1 standard in accordance with BS EN 13501-1:2018 to meet Regulation 7 of the Building Regulations.

Membranes used as part of the external wall construction should achieve a minimum classification of European Class B-s3, d0.

Note, inset balconies are specified attachments and therefore they should also be constructed from materials achieving Class A1 or A2-s1, d0.



7.5 Roof Coverings

The distance between the building and the relevant boundaries has been measured to be less than 6m in some cases. Therefore, it is expected that a classification of B_{ROOF} (t4) should be achieved for the entirety of the roof in accordance with BS EN 13501-1:2018.

7.5.1 Green roofs

BS 9999 takes account of the risk that a roof covering imposes on a building when considering fire spread from and to neighbouring buildings. It does this by limiting the composition of roof coverings relative to their location from the site boundary; the closer to the boundary, the more onerous the requirements. However, this guidance is not specific to green roofs nor is it easily applicable to the same.

It is therefore recommended that the “*Fire Performance of Green Roofs and Walls*”, issued by the Department for Communities and Local Government, DCLG (August 2013) [23], and “The Green Roof Organisation GRO fire risk guidance document” [24]. These documents will be adopted as a basis of design for any green roof proposed in this design. The document assesses the suitability of certain green roofs based on their organic build-up and likelihood to promote fire spread. It describes the fire risk imposed by a typical build-up of a roof garden, that being, a base “growing layer” consisting of organic matter topped by the resulting vegetation/ shrubbery above.

7.6 – Space Separation

To limit the potential for the spread of fire from one building to another, limitations are placed upon the amount of unprotected area permissible upon a building façade. Following the approach within BR 187 2nd Edition [25], the amount of unprotected area (i.e., the area of an elevation offering no fire resistance) of external walls more than 1 m from the relevant boundary is determined based upon the dimensions of the façade, the internal compartmentation of the building, the distance from the façade to the relevant boundary, and the presence of fire suppression.



8 ACCESS AND FACILITIES FOR FIRE-FIGHTING

As well as supporting the building occupant life safety objectives, the provision of both passive and active fire safety systems also provides substantial benefits to firefighter operations. These includes the provision of a means to quickly identify the location of a fire and facilities from which to coordinate a response.

This section addresses the access for the Fire and Rescue Service (FRS) and equipment, defines the position of the water supplies, firefighting equipment, firefighting lifts, stairs and lobbies, and their ongoing maintenance and monitoring.

8.1 Vehicle Access

Vehicle access to the site is between Park Lane and High Road (A1010) to the building, where Park Lane is to be the primary access point for the building where access can be made directly into the south of the building from this point. These access routes are as illustrated in Figure 13 and Figure 14.

Further, alternative firefighter access to the building can be from the podium side, with fire service vehicle access confirmed to be suitable for this portion of the site.

All these access routes and hardstanding's are to comply with the those listed in Table 6 for high-reach appliances. These are expected to be adequate for access routes given they are an existing condition within a developed area, but this should be confirmed.

The entrance points to all fire-fighting stairs should be within 18m of the firefighter access points. Where the associated wet riser booster inlets should also be located within 18 m of these nearest parking location for these pumping appliances, adjacent to the firefighter access points of the building, as appropriate.

Table 6: Typical Vehicle Access Route Specification as per Guidance Note 29 [26].

Appliance type	Minimum width of the road between kerbs	Minimum width of gateways	Minimum turning circle between kerbs	Minimum turning circle between walls	Minimum clearance height	Minimum carrying capacity
Pump	3.7 m	3.1 m	16.8 m	19.2 m	3.7 m	14.0 tonnes
High reach	3.7 m	3.1 m	26.0 m	29.0 m	4.0 m	17.0 tonnes

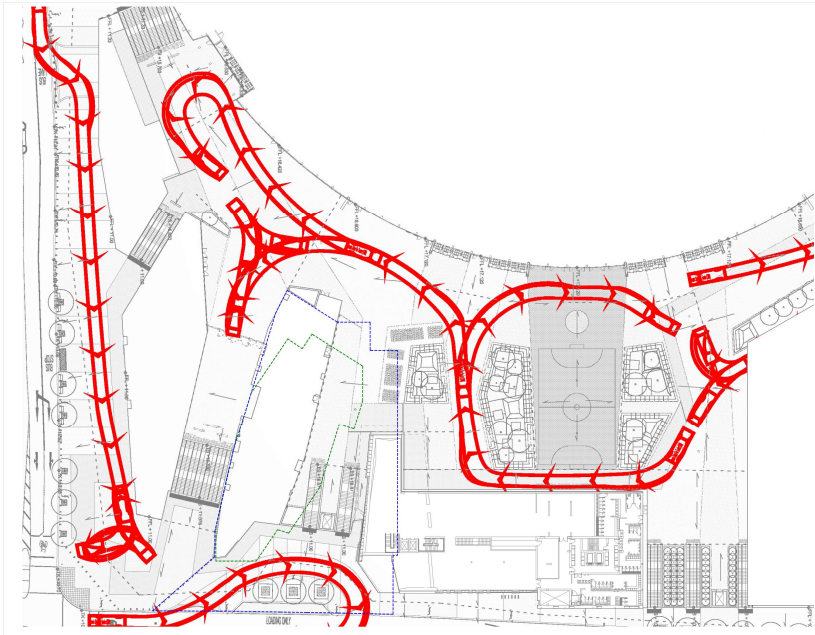


Figure 13: Ground floor access routes and vehicle tracking

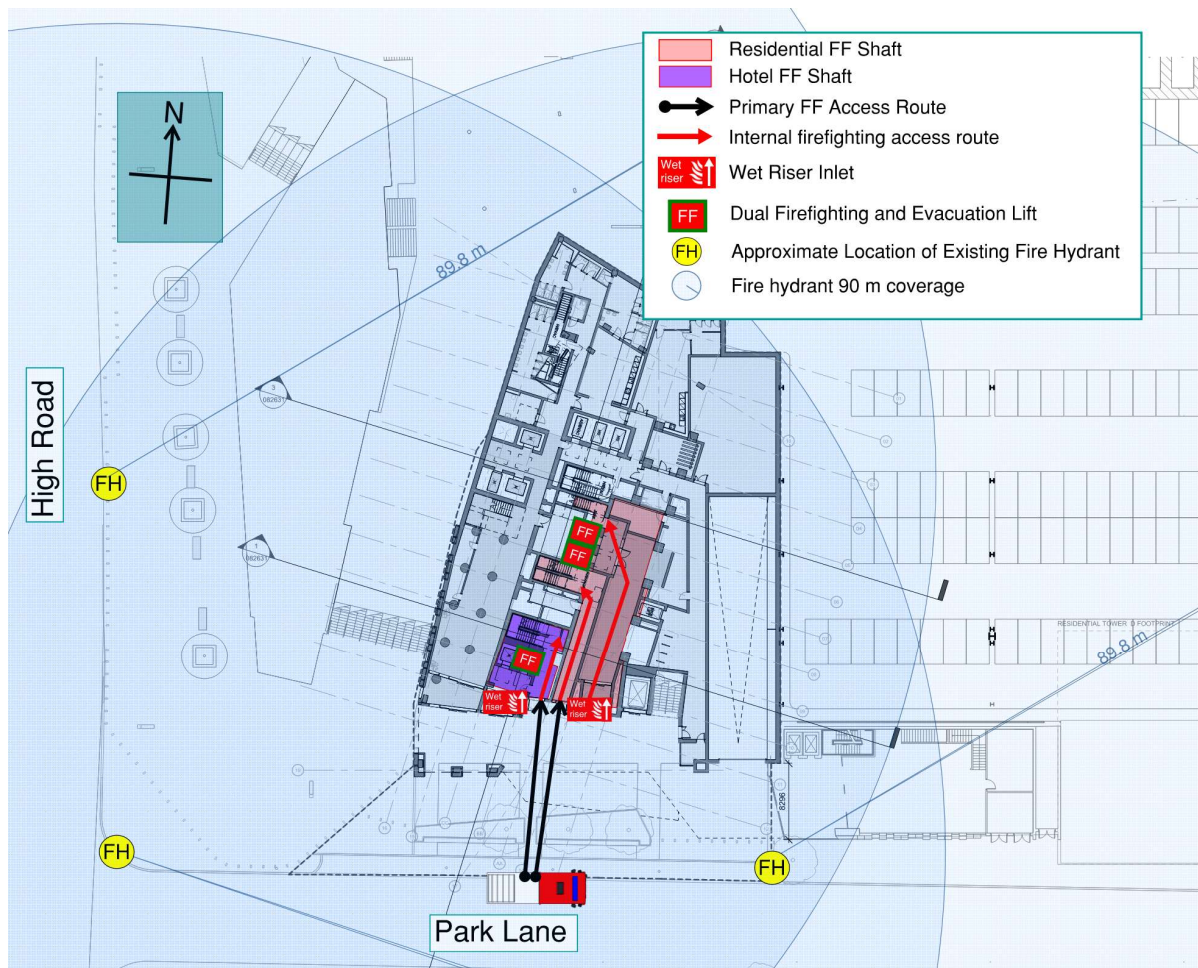


Figure 14: Fire Service Access and Hose Laying– Ground Floor



8.2 Residential

8.2.1 Firefighting Shafts

The proposed building is over 18 m in height to the topmost accessible storey, and the building has a floor area over 900m². Therefore, in the residential demise of the building, both of the stair cores have been designed as fire-fighting stairs.

For the residential firefighting stairs, these should be designed as follows:

- Enclosed in 120 minutes fire-resisting construction with FD 60S fire doors;
- Provided with fire-fighting stair having a minimum clear width of 1,100 mm;
- Provided with an AOV at the head of the stair having a minimum free area of 1.0 m²;
- Served by a ventilated fire-fighting lobby on all upper levels. Note that in a residential building, the evacuation lift lobby / common corridors will serve as the fire-fighting lobby;
- Provided with a fire-fighting lift designed and installed in accordance with BS EN 81-72:2020 [27] (Noting that both lifts have been designed as dual firefighting / evacuation lifts in this case – See Section 5.2.8); and,
- Provided with a wet fire main having outlets on each upper level and located within the enclosure of the firefighting stair. Fire mains should be designed and installed in accordance with BS 9990: 2015 [28].

It is also to be noted that the firefighting lifts within the cores of these blocks should be configured such that this distance between the stair door and firefighting lift door is less than 7.5 m.

Following the recent DLUHC public consultation on two-stair designs for buildings over 30m in December 2022, a second stair has been provided across all residential levels to assist with means of escape and to provide an alternative access route for the fire service. This stair serves into one of the common corridors of the residential levels, with the primary firefighting stair opening directly into the lift lobby served by the two firefighting lifts.

One of these stairs serving the residential also serve down to the basement level, this is in line with guidance recommendations (See Section 5.2.7).

8.2.2 Hose Laying distances

All portions of the building should be within 60 m from the wet rising fire main within a firefighting shaft (as per the recommendations of BS 9999: 2017).



8.3 Hotel

8.3.1 Firefighting Shafts

The proposed building is over 18 m in height to the topmost accessible storey, and the building has a floor area over 900m². However, in the hotel demise of the building, only of the stair cores have been designed as fire-fighting shafts.

For the fighting shaft, this should be designed as follows:

- Enclosed in 120 minutes fire-resisting construction with FD 60S fire doors;
- Provided with fire-fighting stair having a minimum clear width of 1,100 mm;
- Provided with an AOV at the head of the stair having a minimum free area of 1.0 m²;
- Served by a ventilated fire-fighting lobby on all upper levels.
- Provided with a fire-fighting lift designed and installed in accordance with BS EN 81-72:2020 (Noting that the lift here has been designed as dual firefighting / evacuation lift in this case – See Section 5.3.7); and,
- Provided with a wet fire main having outlets on each upper level and located within the enclosure of the firefighting lobby. Fire mains should be designed and installed in accordance with BS 9990: 2015.

It is also to be noted that the firefighting lifts within the cores of these blocks should be configured such that this distance between the stair door and firefighting lift door is less than 7.5 m.

On the hotel levels, and in consideration of the floor areas, which marginally exceed the 900m² area limitation as stated by guidance for a single firefighting shaft. However, only one firefighting shaft has been proposed within the hotel levels given that the 900m² area limit is only exceeded when measuring GIA, in which the NIA excluding the cores falls below this limit. This is subject to discussion and approval with the approval authorities.

In addition to the above, the second stair core serving the hotel levels, although not designed as a firefighting shaft, will be a protected stair core which is to have a wet riser provided and smoke ventilated lobby at all levels, to support firefighting operations.

Both of these protected stair cores serving the hotel demise also serve down to the basement level, further an additional non-firefighting stair serves down the basement level to assist with hose coverage at this level, this stair should be provided with a dry riser.

8.3.2 Hose Laying Distances

All portions of the building should be within 60 m from the wet rising fire main within a firefighting shaft, or within 45m of the dry riser main in the non-firefighting stair (as per the recommendations of BS 9999: 2017).

The only exception the above is the basement level, where there is an extended distance to reach the plant at the north portion of the basement. To support this an additional dry riser was introduced to the northernmost stair serving this space. However, there are still areas that fall behind this 45m limit, this approach will be subject to agreement with the approval

authorities. It is noted that these spaces served by the extended distances, are only low risk water plant for the building.

8.4 Fire Service Wayfinding Signage

In line with best practise as per the 2020 amendment to ADB, to assist the fire service to identify each floor in a block of flats with a top storey more than 11m above ground level i.e. all cores, floor identification signs and flat indicator signs should be provided.

8.5 Premises Information Box

A premises information box is proposed to be provided at ground level, near the fire service entrance point for the building.

8.6 Water Supplies

Hydrants should be within 90 m of the fire main inlet points to support fire-fighting operations. Provisions are expected to be satisfactory by virtue of being an existing condition in a developed area.

However, it has been confirmed through correspondence with the LFB Water Team that the water supply provisions (including hydrant location and flow rates), are suitable and operable within the site.

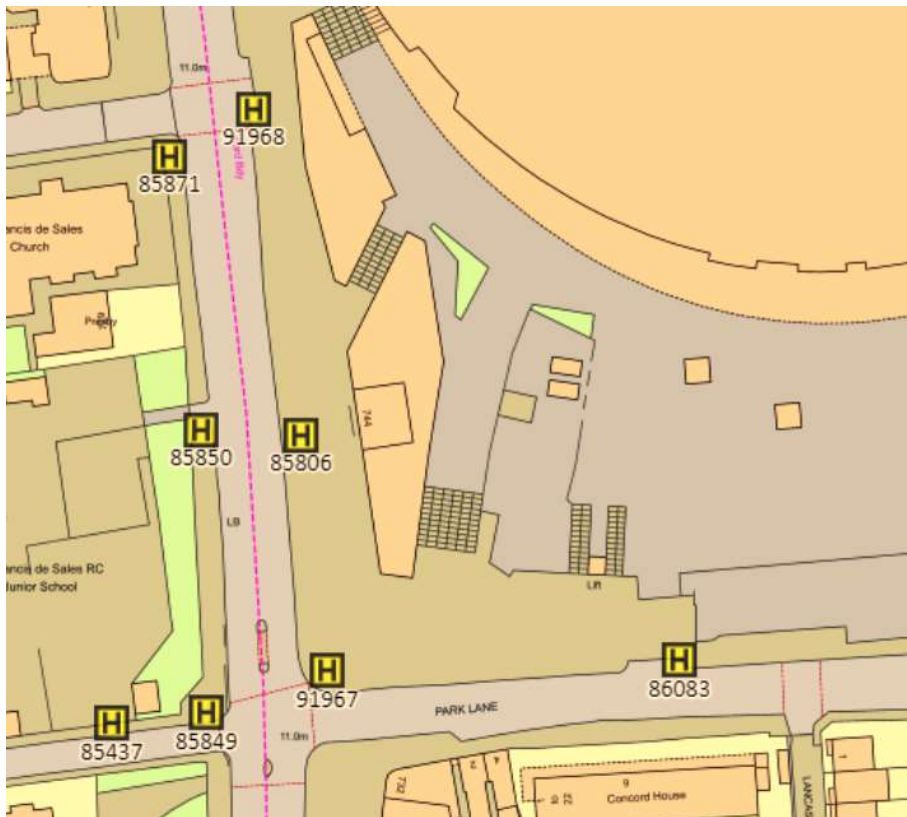


Figure 15: Site Fire Hydrant Locations (As provided by the LFB Water Team)



9 FUTURE MODIFICATIONS

This Fire Statement documents the main fire safety design principles for the purpose of the planning submission. The proposals herein will be subject to further specification and changes as the design progresses. As the design progresses, a detailed fire strategy will be produced with a level of information suitable for Building Regulations approval. At the relevant stage, the detailed fire strategy will also form part of the information pack handed over to the building operator(s) under Regulation 38 to assist the responsible person to carry out the necessary fire safety risk assessment(s) and implement other relevant duties in accordance with the Regulatory Reform (Fire Safety) Order 2005.

10 CONCLUDING STATEMENT

To conclude this Fire Statement, the current proposals provide a design which is suitable for the purposes outlined in this document. It provides adequacies in line with Policy D12B, whilst taking a pragmatic approach to Policy D5 of the London Plan 2021 and provides a design which is considered to demonstrate compliance with the functional requirements of Part B of the Building Regulations 2010 (as amended).



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