Fire Statement – North Crescent

OX20067 02/07/21 R01

Minerva House and The Telephone Exchange, North Crescent, Chenies Street, London, WC1E

1 BACKGROUND AND DOCUMENT PURPOSE

OFR Consultants have been appointed by Morris+Company on behalf of Schroders UK Real Estate Fund to provide fire engineering input and to provide a fire statement in support of the planning application for the North Crescent proposal, which seeks to provide high-quality office space within two existing buildings through sensitive modification and extension. The site comprises two office buildings facing North Crescent: Minerva House, which is a Grade II listed building, and Telephone Exchange. The proposal is to combine these two existing buildings into one and to add a fourth floor to both buildings.

North Crescent is located in the London Borough of Camden and so the development is therefore subject to the London Plan 2021; that 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.

The New London Plan was published in March 2021 and is now readily available. The Plan is part of the statutory development for London, meaning that the policies in the Plan should inform decisions on planning applications across London. In support of the New London Plan, three draft guidance documents outlining the details required to comply with Policies D5 and D12 have been released under the reference Draft Fire Safety Guidance (pre-consultation, for information), these can be referred to for specific guidance on these points.

Policy D5 'Inclusive Design' of the London Plan requires developments to incorporate evacuation lifts to ensure safe and dignified emergency evacuation for all building users, including those requiring level access from the building.

Policy D12 of the London Plan requires development proposals to achieve the highest standards of fire safety, embedding these at the earliest possible stage. The proposals in this document follow the headings outlined in Policy D12 of the London Plan, covering:

1) The building's construction: methods and products & materials used;
2) The means of escape for all building users and evacuation strategy;
3) Features which reduce the risk to life such as fire alarm systems, passive and active fire safety measures and associated management and maintenance plans;
4) Access and facilities for the fire service personnel;
5) How provision will be made within on site to enable fire appliances to gain access to the building; and
6) Ensuring that any potential future modifications to the building will take into account and not compromise the base build fire safety/protection measures.

The aim of this document is therefore to demonstrate that the relevant fire safety aspects of the design to date and the approach / methodology that OFR are adopting with regards to the Building Regulations are appropriate. Timely involvement will be required with the Building Control Officer and consultation with the London Fire Brigade, with their comments and feedback to be incorporated into the design.

This document does not constitute the detailed fire strategy developed under the Building Regulations, which is to be developed 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 fire-fighting in light of the London Plan's fire safety policy requirements and the rationale for these measures.

This fire statement covers the refurbishment and limited extension of Minerva House and the Telephone Exchange on North Crescent only. The exhaustiveness and definitiveness of the statement is commensurate with the nature of the planning application submitted.

2 COMPETENCY AND QUALITY ASSURANCE RECORD

The London Plan Policy D12 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.

In line with Policy D12 of the London Plan, a suitably qualified Chartered Engineer has been involved in the production of this document. Where the relevant below checkers and approvers are Chartered Engineer's with the Engineering Council UK and have the post-nominals CEng (Chartered Engineer) after their name. All who have been involved are also registered with the Institute of Fire Engineers with the post nominals AIFireE / MIFireE after their names.

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3 DESCRIPTION OF THE BUILDING

The proposed redevelopment of North Crescent consists of the existing Minerva House and Telephone Exchange being combined into a single office building with the addition of a new fourth floor and an infill and extension of the second and third floorplates.

Both the existing buildings have five storeys (lower ground, ground, first, second and third floors). The proposed building will have seven storeys (lower ground, ground, first, second, third, fourth, and fifth floors). The uses of each floor are as follows:

- **Lower ground floor/basement** – the basement area on the Alfred Mews side of the building comprises plant rooms and back of house areas and is deeper than the lower ground floor area on the North Crescent side of the building which comprises cycle storage;
- **Ground floor** – comprises the main entrance and amenity spaces on the North Crescent side of the building with office space on the Alfred Mews side of the building;
- **First, second, third and fourth floors** – comprise office space;
- **Fifth floor** – is an external roof with open air plant.

The height of the building, as measured from the fire service access level to the finished floor level of the topmost occupied storey (i.e. the fourth floor) is 17.2 m, as shown in Figure 1.

The building will have five protected escape stairs, four of which are shown in Figure 2:

- **Stair 1** – the existing internal escape stair in the West corner of Minerva House, which serves all upper storeys;
- **Stair 2** – the existing internal escape stair in the South corner of Minerva House, which serves all upper storeys except for the fourth floor. It also provides access to the plant areas in the basement;
- **Stair 3** – the existing external escape stair accessed from the North corner of Telephone Exchange, which is shared with Fitzroy House. This stair will be extended upwards so that it serves all upper storeys including the fourth floor;
- **Stair 4** – a new stair in new core located in the centre of the floor plate in Telephone Exchange, which will serve all upper storeys, the roof, and the lower ground floor;
- **Stair 5** – a new protected stair in the North of Telephone Exchange serving the basement plant area only.

Minerva House and The Telephone Exchange, North Crescent, Chenies Street, London, WC1E

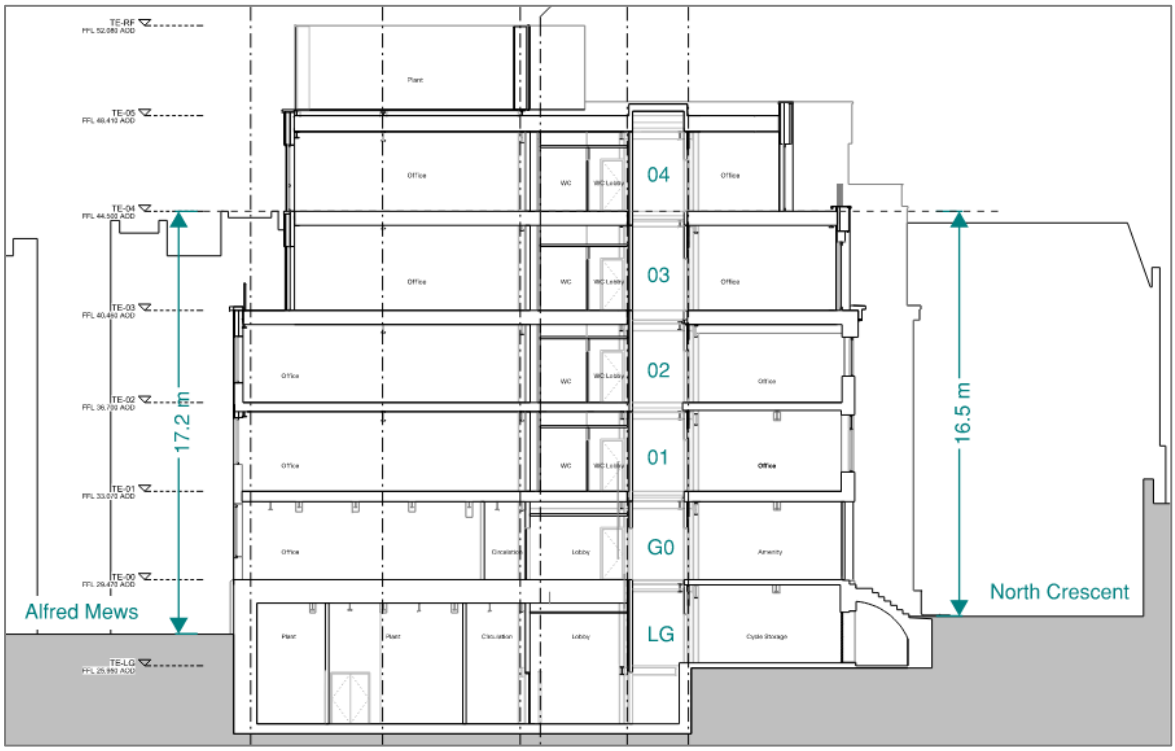

Figure 1: Section A-A through Telephone Exchange - Building Heights

Figure 2: Escape Stairs on the Second Floor

4 DESIGN APPROACH AND METHODOLOGY

The minimum fire safety goal for the building is to provide a reasonable standard of health and safety in accordance with the current social, economic, and sustainability context. This will be achieved by satisfying the functional requirements of Part B of Schedule 1 to the Building Regulations 2010 (as amended, 2018) [1], the Construction Design and Management Regulations 2015 (CDM) and the operational fire safety requirements of the Regulatory Reform (Fire Safety) Order 2005 (RRO).

4.1 Relevant Stakeholders

Relevant stakeholders in the building and preparation of fire safety information are:

- The Client – Schroders UK Real Estate Fund;
- The appointed Building Control Body – Butler and Young;
- London Fire Brigade (LFB);
- The architect – Morris+Company;
- Other members of the design team, and the consultant teams.

4.2 Basis of Design

Under the Building Regulations 2010 (as amended):

"An alteration is material for the purposes of these Regulations if the work, or any part of it, would at any stage result–

a) in a building or controlled service or fitting not complying with a relevant requirement where it previously did; or,
b) in a building or controlled service or fitting which before the work commenced did not comply with a relevant requirement, being made more unsatisfactory in relation to such a requirement."

Therefore, an assessment of the proposed alterations to Minerva House and Telephone Exchange has been undertaken to determine whether the completed building will be no less compliant with Parts B1-B5 of Schedule 1 of the Building Regulations. In the first instance this is assessed using BS 9999 [2] as the basis for design. The building design has subsequently been developed with this in mind to ensure that there is either an improvement on or at least no worsening of the existing condition. This approach has been agreed with the project team, including the appointed Building Control Body.

For example, the fire-fighting provisions will be improved through the provision of internal fire-fighting facilities, as described in Section 8. Similarly, the potential for fire spread externally has been assessed with it being noted that there is potentially a worsening of the existing condition due to the buildings being combined into one. However, this has been mitigated through the provision of compartment floors to limit the size of the fire compartment. This is described in more detail in Section 7.4.

As part of the Regulatory Approvals process, the fire strategy and detailed fire safety information and specifications will be the subject of milestone reviews and regular meetings which will be held with representatives from the appointed Building Control Body. To date, there has been engagement with the Building Control Body and this will continue as the design progresses. As the regulatory approver, they will in turn lead the engagement process with London Fire Brigade (both the Fire Engineering Group and the Inspections team). Advice and feedback from these authorities will therefore inform the building design and the fire strategy that is to be developed in support of the Building Regulation application.

5 THE BUILDING'S CONSTRUCTION

The new parts of the building will be constructed as follows:

- The structure of the fourth floor and an infill and extension of the second and third floorplates will primarily comprise a steel frame with hollow core precast concrete slabs.
- There will be small portions of the new structure, such as the mezzanine on the third floor in Minerva House, which will be constructed from cross laminated timber (CLT). The challenges around the use of CLT will be addressed as part of the Building Regulations process.

The building does not fall under the category of a relevant building as defined in Regulation 7(4), and therefore does not fall within the scope of Regulation 7(2) (of the Building Regulations).

However, the new surfaces of the external walls of the building will be designed in accordance with the recommendations in BS 9999. Where practicable, it is recommended that all materials used in the new external wall build up achieve European Classification A2-s2, d0 or A1, classified in accordance with BS EN 13501-1 [3].

The building will have a green roof which will be designed in accordance with the Department for Communities and Local Government guidance document on the Fire Performance of Green Roofs and Walls [4].

6 MEANS OF ESCAPE

A Fire Strategy is being developed for the building. As part of the Fire Strategy there will be a more detailed assessment of the means of escape provisions, which will be updated as the design progresses. Presented below is a high-level summary of these provisions at the current stage of the design.

6.1 Risk Profiles

BS 9999 sets out fire safety measures as a function of risk profile. The risk profile is formed of two components: (a) occupant characteristics and (b) fire growth rate. Risk profiles are allocated to the building according to the potential nature of occupants and hazards to the space. The proposed risk profiles for the buildings are noted in Table 1.

Table 1: Building Risk Profiles

Area(s)	Occupant Characteristics	Fire Growth Rate	Risk Profile
Office	A – awake & familiar	2 – medium	A2
Cycle Store	A – awake & familiar	3 – fast	A3
Services/Plant	A – awake & familiar	3 – fast	A3
External Amenity	B – awake & unfamiliar	2 – medium	B2

6.2 Evacuation Strategy

The building will operate a simultaneous evacuation strategy; that is, upon activation of the fire detection and alarm system all occupants in the building will evacuate simultaneously. This is an appropriate evacuation strategy considering that the extent of compartmentation between floors in the existing buildings is not known.

6.3 Means of Escape Provisions

The building will be designed with appropriate escape provisions as per the recommendations of BS 9999.

6.3.1 Horizontal Escape

All areas will be provided with sufficient exits and escape routes to achieve the minimum required exit widths and travel distances in accordance with BS 9999.

The travel distances in the buildings will be limited in accordance with the recommendations in BS 9999, which depend on the assigned risk profile. Table 2 presents the travel distance limits for the different areas in the building.

In the office and amenity areas the travel distance limits have been increased by 15% due to the provision of an automatic fire detection and alarm system, which is above the minimum recommendation in BS 9999.

Table 2: Travel Distance Limits

Area	Risk Profile	Single Direction Travel Distance [m] [1]	Multiple Direction Travel Distance [m] [1]
Office	A2	25.3	63.2
Plant and Storerooms	A3	18.0	45.0
Amenity	B2	23.0	57.5

Note [1]: These are the actual travel distance limits. Where the fitout layout is not known, the direct travel distances should be used, which should be limited to two thirds of the actual travel distance limits.

Table 3 shows the available horizontal exit capacity on the upper storeys in each building. This is calculated from the number and clear width of the storey exits. The maximum design occupancy is also given in Table 3, which is determined from the NIA of the floorplates and a floor space factor of 6 m^2/person. As can be seen from Table 3, there is sufficient horizontal exit capacity on the upper levels.

These occupant capacity calculations will be refined as the design progresses to take into account the different tenancy splits on the office floorplates; each of the tenant demises will be designed to have at least two exits, which do not require travel through an adjacent tenant's demise.

Table 3: Horizontal Exit Capacity

Storey	NIA [m^2]	Design Load [people] [1]	Min. Exit Width [mm/person] [2]	Width of Exits [mm]	No. of Exits [-]	Horizontal Storey Capacity [people] [4]
04	937	156	3.06	<1050 [3]	3	326
03	1257	209	3.06	<1050 [3]	4	490
02	1330	221	3.06	<1050 [3]	4	490
01	1325	220	3.06	<1050 [3]	4	490
Total		**909**				

Note [1]: The anticipated number of occupants has been calculated by applying a 6 m^2/person density which has been discussed and agreed with the design team.

Note [2]: Based on an A2 risk profile with a 15% reduction due to the provision of an automatic fire detection and alarm system.

Note [3]: Any width under 1050 mm provides the same capacity. However, all storey exits should achieve an absolute minimum clear width of 800 mm, which increases to 850 mm when the exits are anticipated to be used by unassisted wheelchair users. Where existing doorways do not achieve these clear widths, they will need to be evaluated on an individual basis and a decision will need to be made as to whether the condition is being made any worse. Due to the linking of the floorplates and the larger floor area this will likely be the case in most instances, therefore, these doors will need to be brought in line with the current code guidance.

Note [4]: The largest exit has been discounted to account for it being blocked by fire.

6.3.2 Vertical Escape

As described in Section 3, there will be five escape stairs in the building. Table 4 summarises the capacities of the escape stairs serving the upper levels and the subsequent floor capacities after discounting a stair to account for it being blocked by fire. The total stair capacity of **1,301** people exceeds the anticipated number of occupants, which is **909** people as per Table 3. It can also be seen that the stair capacity is the constraining factor for the occupant capacity of the building.

The new protected stair in the Telephone Exchange (Stair 4) is located centrally in the floorplate, therefore it does not discharge direct to external at ground level. Instead, occupants using this stair escape to Alfred Mews via a protected corridor, as shown in Figure 3. All other stairs discharge direct to external. All doors on these final exit routes will have a clear width at least equal to that of the stair that they serve and will open in the direction of escape. The merging of flows on the ground floor will be considered in the fire strategy as the design progresses.

Table 4: Vertical Capacity Above Ground

Stair	Stair Width [mm]	No. of Storeys Served [-]	Min. Stair Width [mm/per] [1]	Stair Capacity [people]	Stair Capacity per Floor [people] [2]
1	1100	4	2.34	470	117
2	1000	3	2.77	361	120
3	1100	4	2.34	470	117
4	1200	4	2.34	512	128
Total				**1301** [3]	

Note [1]: Based on an A2 risk profile and the number of storeys above ground floor served. A 15% reduction in width per person due to the provision of an automatic fire detection and alarm system.

Note [2]: Assuming an even distribution of people across the storeys served.

Note [3]: The stair with the largest capacity (Stair 4) has been discounted.

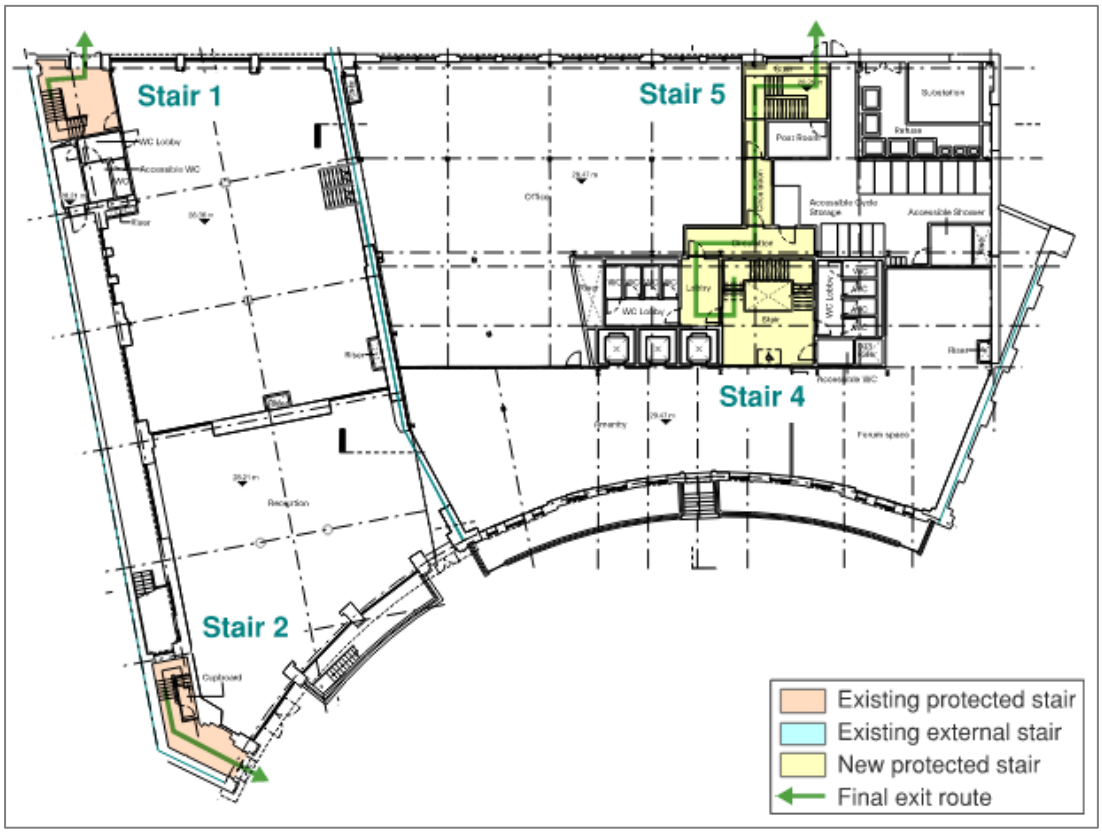

Figure 3: Final Exit Routes from the Protected Escape Stairs

6.3.3 Provisions for Mobility Impaired Persons (MIPs)

For mobility-impaired person (MIP) escape, to address the concerns of Policy D5 'Inclusive Design' of the London Plan, one of the passenger lifts in the new central core will be designed as an evacuation lift and will be provided with a backup power supply. The evacuation lift will be a dual entry lift with day-to-day access via the office/reception area but during a fire event the lift will be accessed via a protected lobby on the other side of the lift shaft. This protected lobby will connect the evacuation lift to the protected stair where there will be a refuge with an emergency voice communication system. The layout on a typical upper level is shown in Figure 4 while the final exit route from the evacuation lift is shown in Figure 5. At the ground floor level MIPs will be able to continue their escape to external via the protected corridor of Stair 4, from where they can access Alfred Mews via the platform lift in the accessible cycle store.

Due to the constraints of the existing building, it is proposed that the evacuation lift will only serve the above ground storeys; it will not serve the lower ground floor. This is considered to be reasonable on the basis that the lower ground floor comprises plant rooms and cycle stores both of which are not anticipated to be used by MIPs. This approach has been discussed and agreed with the design team and the appointed Building Control Body.

A management strategy for the evacuation of MIPs will need to be developed by the end-users, which should detail the use of the evacuation lift in the event of a fire in the building. It is also recommended that personal emergency evacuation plans (PEEPs) be produced for all people requiring assistance to leave the building.

In accordance with BS 9999, Emergency Voice Communication (EVC) systems and suitably sized refuge areas (900 x 1400 mm) should be provided in each of the protected stairs or their lobbies to enable MIPs to communicate with the building's management staff and await evacuation via while not impeding the escape of other occupants from the floorplate who will escape via the stairs.

However, since it is an existing building and three of the five escape stairs are existing, it is proposed that, as a minimum, the new stairs will be provided with a refuge within the protected stair enclosure. Where practicable it is recommended that refuges be provided to the other escape stairs if there is sufficient space within the protected stair enclosures. Although these refuges should not reduce the clear widths of escape routes. This will be an improvement on the exiting condition of the buildings.

In accordance with the Regulatory Reform (Fire Safety) Order 2005, it is the duty of the responsible person along with their appointed safety assistants to assist everyone to a place of ultimate safety outside the building in the event of an emergency and this will include getting MIPs both to and from the refuge locations.

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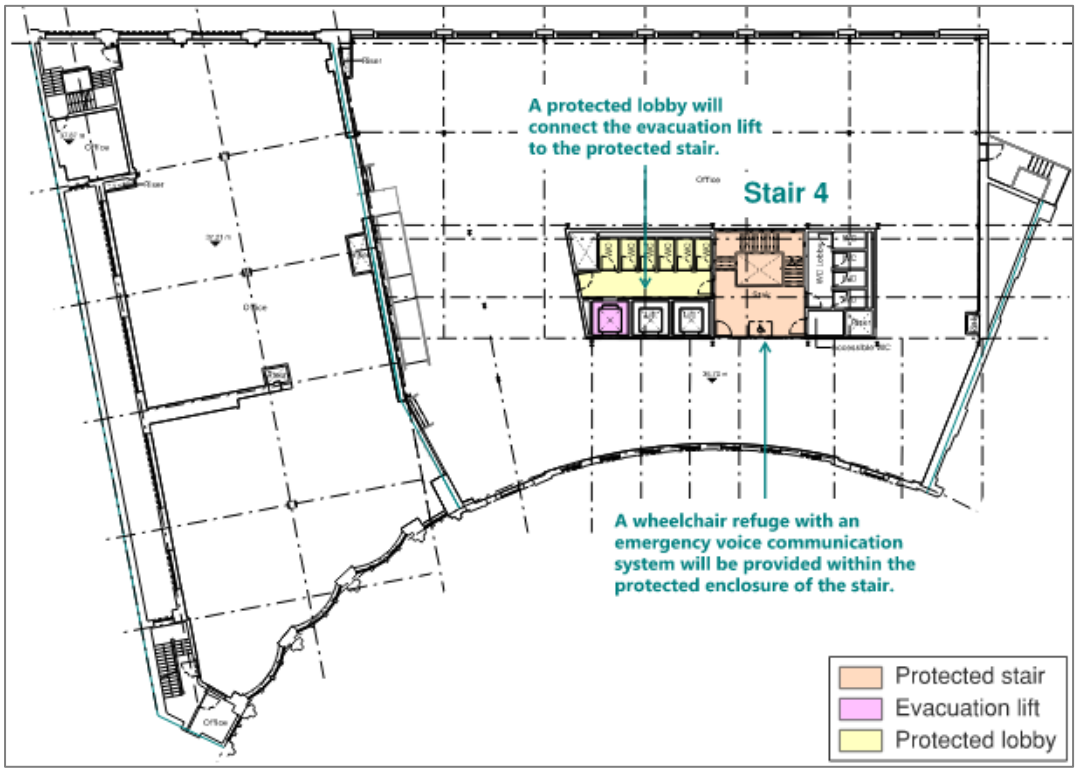

Figure 4: Evacuation Lift Arrangement on the Upper Levels (Second Floor)

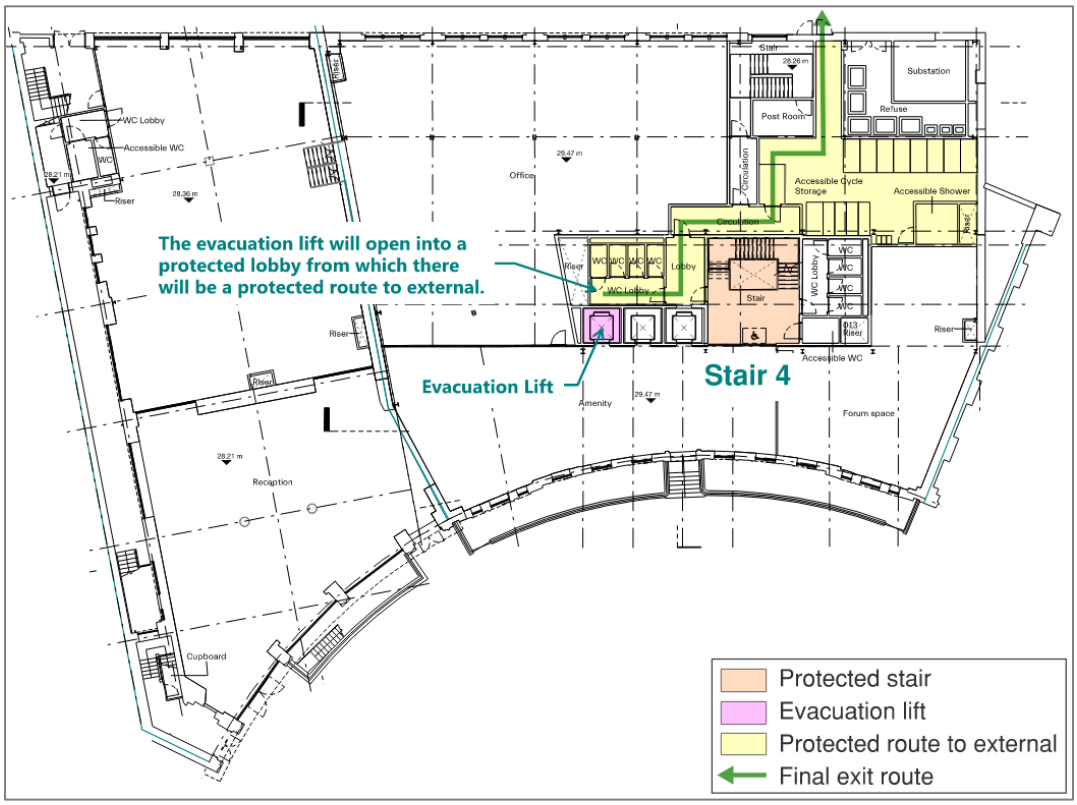

Figure 5: Evacuation Lift and Final Exit Route

7 PASSIVE AND ACTIVE FIRE SAFETY SYSTEMS

Within the building, a balance of passive and active fire safety systems will be provided to support and enable the life safety objectives required by the Building Regulations.

7.1 Means of Detection and Warning

For an office building with an 'A2' risk profile, as defined in Section 6.1, the minimum category of fire detection and alarm system is a manual one, which relies on the occupants in the building detecting the fire and activating the alarm system. However, it is proposed that an automatic fire detection and alarm system (Category L2) be provided throughout the building in accordance with BS 5839-1 [5]. This is an uplift from the minimum recommendations in BS 9999.

The functionality of the fire detection and alarm system will be developed as the design progresses in conjunction with the relevant stakeholders. For instance, the system may be designed with a double knock functionality which will reduce the risk of false alarms triggering evacuation of the building.

7.2 Structural Fire Resistance

The building remains below 18 m in height therefore all elements of structure which form the structural frame (e.g. columns, beams, floors, etc.) should achieve the fire resistance rating of 60 minutes in accordance with BS 9999.

The 60-minute fire resistance rating also applies to:

- Compartment floors;
- Compartment walls;
- Protected shafts (e.g. stairways, lifts, and service risers which penetrate compartment floors);
- High hazard spaces (e.g. electrical rooms operating above low voltage, refuse stores); and
- External walls which require fire resistance.

7.3 Compartmentation

The spread of fire within a building can be restricted by subdividing the building into compartments, separated from one another by walls and / or floors of fire-resisting construction. Compartmentation, horizontal or vertical, can also be used as part of an escape strategy to create areas of relative safety.

The compartmentation strategy for the building will be in accordance with BS 9999 and can be summarised as follows:

- All floors will be formed as compartment floors to limit the extent of fire spread throughout the building in recognition of the existing boundary distances considered as part of the external fire spread assessment as detailed in Section 7.4;
- All shafts through floors (e.g. stairs, risers, lifts etc.) will be formed as individual fire compartments i.e. protected shafts;
- Areas of higher risk (e.g. plant rooms, stores etc.) will be enclosed in fire resisting construction commensurate to the level of risk associated with these areas; and
- All penetrations will be fire-stopped to retain the efficacy of the fire compartment.

Across the building, fire stopping will be suitable for the locations at which it is provided, including being accompanied by appropriate test evidence, with all installers to be third-party accredited.

The maintenance of all the associated fire safety features within the building will be in line with the relevant sections of BS 9999, the manufacturer's recommendations, and other requirements of the Building Regulations.

7.4 External Fire Spread – Space Separation

The risk of external fire spread must be assessed and mitigated to ensure that fire spread from the development to adjacent premises is adequately restricted. This can be by following the methods in BRE Report BR 187 [6] to determine the required minimum boundary distance without the need to provide fire resisting elevations or to calculate the required areas of the facades that need fire protection.

By combining the two existing buildings (Minerva House and Telephone Exchange) into a single building there is the potential for the existing condition, in terms of external fire spread, to be made worse. However, an external fire spread assessment has been undertaken in accordance with the recommendations in BS 9999 which has informed the design of the new building. The outcome being that compartment floors will be provided, which will be an enhancement on the existing condition. These compartment floors will restrict fire spread between floors and therefore limit the extent of the building that may be involved in a fire and therefore limit the risk to neighbouring buildings.

From the initial external fire spread assessment the allowable unprotected area for the elevations has been determined. Based on the results of this assessment, the non-glazed portions of the façade will be fire protected while the glazed areas will be unprotected. The protected area of the façade will achieve 60 minutes fire resistance in terms of integrity and 15 minutes in terms of insulation, from the inside. This assessment will be updated and refined as the design progresses.

The relevant boundaries for the building are the midpoint of Alfred Mews to the North-West and North Crescent Road to the South-East.

7.5 Emergency Power Supplies

Emergency power supplies are to be provided for all active fire safety systems, including the following:

- Automatic fire detection and alarm system;
- Emergency lighting (to be specified as the design progresses); and
- Evacuation lift for MIP evacuation.

7.6 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.

8 ACCESS AND FACILITIES FOR FIRE-FIGHTING

Vehicle access to the building will be via Tottenham Court Road and Chenies Street. The North side of the building will be accessible from Tottenham Court Road via Alfred Mews. The South side of the building will be accessible from Chenies Street via North Crescent.

Due to the existing nature of the scheme, the design going forward will need to consider what would be reasonable enhancements in the context of the regulatory requirements to ensure that the fire-fighting provisions are not made more unsatisfactory than they are currently.

The building will be provided with facilities for internal fire-fighting. In the new protected stair in Telephone Exchange (Stair 4) and in the existing West protected Stair in Minerva House (Stair 1) dry fire mains will be provided. The lower ground/basement area on the Alfred Mews side of the building will also be served by a dry fire main outlet located in Stair 5. This will be an improvement on the existing condition of these buildings.

To support internal fire-fighting operations, all parts of the floor plate should be within 45 m of a dry riser outlet, as measured on a route suitable for laying hose. This can be achieved from the dry riser outlets located in Stairs 1, 4 and 5.

9 WATER SUPPLIES

The development is on an existing site, where exiting hydrants are expected in the vicinity of the buildings. The location and condition of these hydrants is to be confirmed as the design progresses by the design team. If hydrants are more than 90 m away from the fire main inlet, or existing hydrants are not of sufficient capacity, liaison with the Fire and Rescue Services will occur to gain an agreement on an alternative water supply arrangement.

10 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.

Any future alterations to the scheme shall not compromise the fire safety strategy of the building, with approval from the relevant authorities required to be attained where and as necessary.

11 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 Policies D5 and D12 of the London Plan 2021 and provides a design which has the potential to comply with the functional requirements of Part B of the Building Regulations as required.

REFERENCES

[1] HM Government, The Building Regulations 2010, incorporating 2018 amendments, Ministry for Housing, Communities & Local Government, 2019.

[2] BSI, BS 9999:2017 Fire safety in the design, management and use of buildings - Code of practice, British Standards Institution, 2017.

[3] BSI, BS EN 13501-1:2018 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests, British Standards Institution, 2018.

[4] DCLG, "Fire Performance of Green Roofs and Walls," Department for Communities and Local Government, 2013.

[5] BSI, BS 5839-1:2017 Fire detection and fire alarm systems for buildings - Part 1: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises, British Standards Institution, 2017.

[6] R. Chitty, "External fire spread: building separation and boundary distances (BR 187), 2nd ed.," IHS BRE Press, 2014.