Oriel

Fire Safety Statement

Moorfields Eye Hospital NHS Foundation Trust
UCL Institute of Ophthalmology
Moorfields Eye Charity

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AECOM

Oriel
Fire Safety Statement

Quality information

Prepared by	Checked by	Verified and Approved by
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
00	03/09/20	First draft	Yes	CP	Regional Director
01	17/12/21	GLA Comments addressed	Yes	SD	Director
02	13/01/22	Goods lift to evacuation lift	Yes	SD	Director

Distribution List

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Prepared for:

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UCL Institute of Ophthalmology
Moorfields Eye Charity

Prepared by:
AECOM Limited

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1 Fire Safety Statement

1.1 Policy D12 of London's Draft Plan

1.1.1 In accordance with Policy D12 of the Mayor of London's Draft Plan – 2019, all major development proposals should be submitted with a fire statement which details how the development will function in terms of key items. These key items are listed in the table below and either a statement is provided, or reference is made to the section in the report which addresses each item.

Table 1-1 Draft London Plan – Policy D12 requirements

Policy D12	Reference
1) Building's construction	In terms of the fire strategy, the development will follow the design guidelines of Approved Document B. The building materials used will be in accordance with the requirements of amendments to Regulation 7 of the Building Regulations. Further details of the materials to be used in the construction are detailed in the wider architecture planning proposal. It is not proposed to utilise combustible materials as part of the primary building construction. Manufacturers details for fire safety features within the design will be made available as the design moves into the detailed design stage.
2) Means of escape of all building users	Refer to 7.2- 7.14
3) Features which reduce the risk to life	Refer to 7.3 and 7.5
4) Access for fire service personnel and equipment & Fire suppression systems	Refer to 7.20 and 7.23
5) Provisions to enable fire appliance access to the building	Refer to 7.21
6) Future modifications will take into account and not compromise the base build fire safety/protection measures	All future modifications are required to comply with the Building Regulations and the base build fire strategy. Fire Safety information for the development should be handed over to the owner of the development once completed, and it is expected that competent individuals will review this information when making future amendments.

1.1.2 3.12.9 within Policy D12 requires that the fire statement shall be produced suitably qualified assessor such as a chartered engineer registered with the Engineering Council by the Institution of Fire Engineers. The declaration can be found in in the table below.

Table 1-2 Declaration

Declaration	Signed
Simon Dent has overseen the fire safety design for this project and can declare that the building meets the intent of the London Plan Policies as outlined within the DRAFT London Plan	 Simon Dent CEng, BEng, MIFireE.

2 Introduction

2.1 Overview

2.1.1 AECOM has been commissioned by Moorfields Eye Hospital NHS Foundation Trust ('the Trust'), on behalf of Oriel[1], to provide fire engineering support for the design of a new facility that would allow the existing Moorfields Eye Hospital at City Road (Moorfields at City Road) and University College London (UCL) Institute of Ophthalmology (IoO) services at Bath Street to relocate into a single building at the existing St. Pancras Hospital site (hereafter referred to as the 'Proposed Development').

2.1.2 The Proposed Development will be located at part of the existing St. Pancras Hospital site within the London Borough of Camden (LBC) (hereafter referred to as the 'Site').

2.1.3 This statement outlines the fire safety strategy principles that have been developed for the Proposed Development. Some elements of the fire strategy will require further detailed development, and agreement with the 'Stakeholders', which includes the Trust fire officer, and the Building Control Authority, who will in turn consult with the Fire Brigade. For this development the Building Control Authority will be represented by a Corporate Approved Inspector, who will consult the London Fire Brigade.

2.1.4 This statement was originally submitted as part of the Planning Submission in November 2020. This revision of this Statement includes updated and additional text added to reflect comments received from the Greater London Authority. Revision 02 of this statement does not capture any other changes to the scheme which have occurred during the design development of the project.

2.1.5 At the time of the original submittal, the London Plan was in Draft and subject to final comments. Although in draft, the original planning statement was written to meet the intent of the London Plan.

2.1.6 Since the original issue of this planning statement, The London Plan has been formally published. Alongside the formal publication a set of guidance documents have also been published including.

- Evacuation Lifts guidance to apply London Plan Policy D5 Inclusive Design section (Policy D5(B5)); and
- Fire Statements guidance which provides further information to apply London Plan Policy D12 Fire Safety section (Policy D12(B)).

2.1.7 Notwithstanding the fact that the publication of these new guidance documents occurred after the submittal of the Fire Safety Statement, within this revision AECOM have aimed to describe how the design addresses the requirements [of the new guidance documents].

[1] Oriel is a joint venture between Moorfields Eye Hospital NHS Foundation Trust, University College London Institute of Ophthalmology and Moorfields Eye Charity

2.2 Goals and Objectives

2.2.1 The fire engineering design process involves the development of fire safety solutions that meet appropriate fire safety goals within the project constraints.

2.2.2 The overall objective is to develop a fire safety solution which will continue, once further detailed design progression has occurred, to comply with relevant legislation, such as:

- The Building Regulations 2010, Schedule 1, Part B (Ref. 1);
- Construction Design and Management Regulations 2015 (CDM) (Ref. 2); and
- Regulatory Reform (Fire Safety) Order 2005 (FSO) (Ref. 3).

2.2.3 Therefore, the minimum fire strategy goals for the Proposed Development are:

- To comply with the functional requirements of Part B of the Building Regulations 2010;
- To be designed, buildable and maintainable in accordance with CDM; and
- To be manageable in accordance with the FSO without relying on an unrealistic or unsustainable management regime.

3 Basis of Design

3.1.1 The relevant legislation for design includes Part B of the Building Regulations 2010 and the Regulatory Reform (Fire Safety) Order 2005. The fire safety strategy must, ultimately, achieve the functional requirements of the Building Regulations.

3.1.2 Regulation 4 of the Building Regulations 2010 requires that once construction is complete and the Proposed Development is operational, the building must comply with the relevant requirements, namely:

- Part B1 – Means of warning and escape;
- Part B2 – Internal fire spread (Linings);
- Part B3 – Internal fire spread (Structure);
- Part B4 – External fire spread; and
- Part B5 – Access and facilities for the fire service and the documents to which it refers.

3.1.3 For non-patient access levels, The Building Regulations Approved Document B Volume 2, 2019 (ADB) (Ref. 4) has been used to supplement the Health Technical Memorandum (HTM) 05-02 Firecode (Ref. 6) which presents guidance with respect to the maximum travel distances and the minimum escape route widths. This is to ensure that the escape routes are adequately sized and protected for the number of people escaping from the

non-patient areas. Further explanation is given in the following sections on how application of the ADB has been used to supplement HTM 05-02, and why its use is deemed appropriate.

3.1.4 All five requirements of the Building Regulations Part B (Fire Safety) listed above will be met. However, any deviation or relaxation from the HTM 05-02 guidance will be proposed for agreement with the Stakeholders, and the implications arising from the deviation will need to be agreed before adoption.

4 Building Description

4.1.1 The detailed building description of the Proposed Development can be found in the Design and Access Statement submitted with the planning application.

4.1.2 The Proposed Development comprises a single building, between seven and ten storeys in height (including Ground Level and Lower Ground Level, as well as plant at Roof Level), as well as provision of public realm at ground level, blue badge parking, and vehicular drop off points along St Pancras Way. The building is arranged around a central atrium and connection space. There is also a roof terrace on the Sixth Floor Level on the south-western corners of the building.

4.1.3 The height of the Proposed Development will be up to 69.15 metres (m) Above Ordnance Datum (AOD) and will have a gross external area of approximately 48,851 square metres (sq m) and a gross internal area of approximately 46,468 sq m.

4.1.4 The Proposed Development will comprise a mix of uses including clinical, research and education purposes, including accident and emergency (A&E) department, outpatients, operating theatres, research areas, education space, café and retail areas, facilities management, office space and plant space.

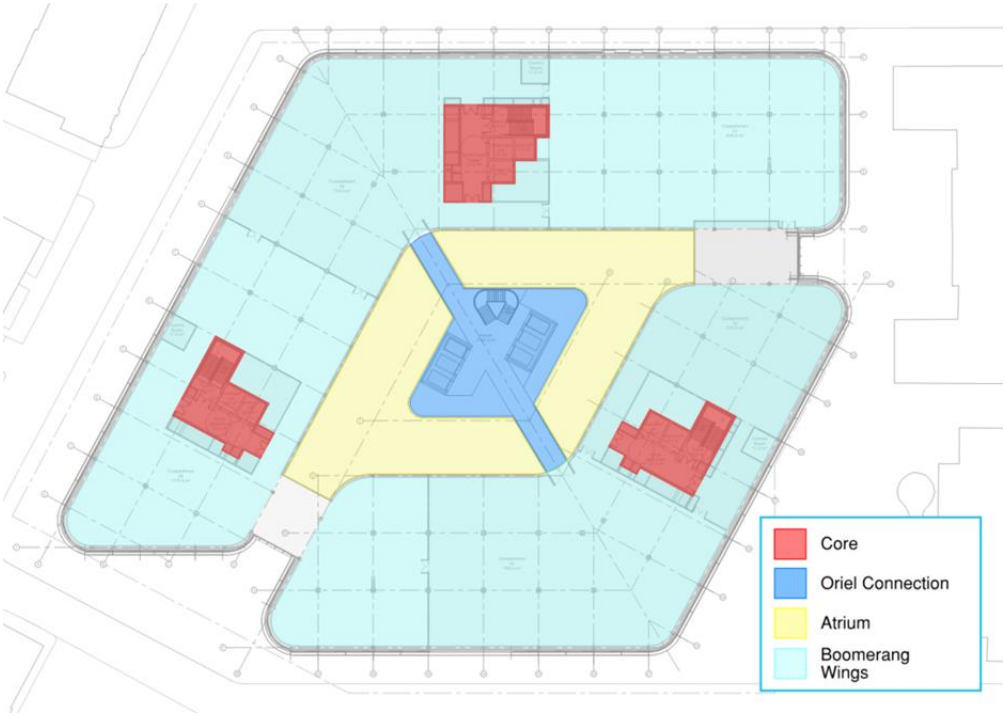
4.1.5 The relevant fire safety features of the Proposed Development include the following, illustrated on Figure 3-1 below which shows a typical upper floor arrangement:

- The height of the building from the lowest firefighting access level (Lower Ground Level) to the eighth floor is 38 m.
- The building consists of up to ten storeys (including Lower Ground Level, Ground Level and eight storeys above ground level) and rooftop plant.
- The building will include three stair cores. The northern and eastern cores allow access to all floors, with the southern core only extending up to a rooftop terrace on the sixth floor.
- A central atrium extends up through the building, incorporating the seventh floor, with the atrium base split over the Ground and Lower

Ground Levels. The base of the atrium will be used primarily as a circulation space with reception and exhibition areas located on the Ground Level. The central Oriel Connection space on upper levels will be used as waiting and breakout areas.

- The largest projected floor plan is on the Lower Ground Floor where the Gross Internal Area (GIA) measures 6,035m^2.
- The building will be provided with an automatic water suppression system throughout. Further details on the performance specification of the water suppression system can be found in Section 6.5 of this document.

Figure 4-1: Typical upper floor arrangement



5 Occupancy Profile

5.1.1 HTM 05-02 makes recommendations with regard to the fire safety design of a building based on the “dependency” of its intended occupancy, i.e. those most likely to use a given space within a building. HTM 05-02 gives three classifications for patient dependency:

- **Independent –** Patients whose mobility is not impaired in any way and they are able to physically leave the premises without staff assistance, or they experience some mobility impairment and rely on another person to offer minimal assistance, being sufficiently able to negotiate stairs unaided or with minimal assistance.
- **Dependent –** All patients except those classified as “independent” or “very high dependency”.

- **Very high dependency** – Those whose clinical treatment and/or condition creates a high dependency on staff. Including those in intensive care areas, operating theatres, coronary care etc. and those for whom evacuating would prove potentially life threatening.

5.1.2 For non-patient access areas, the ADB gives recommendations for the fire safety design of the building by classifying areas into 'Purpose Groups'. This will differ depending on the use of the space with similar risk areas being classified together.

5.1.3 Classifications of each space within the Proposed Development according to ADB and HTM 05-02 are summarised within Table 4-1.

Table 5-1 Purpose Group Classification

Spaces	HTM 05-02 Dependency	ADB Purpose Group
A&E and Urgent Care	Dependent	Not applicable
Education	Not applicable	3 - Office
Plant	Independent	Not applicable #
GF/LGF retail areas	Independent*	Not applicable
All other ancillary areas	Independent	Not applicable
Outpatients	Dependent	Not applicable
Theatres & Recovery	Very high dependency	Not applicable
Research and office areas	Not applicable	3 - Office
Atrium base	Independent*	Not applicable

Although ADB has a purpose group for plant areas ("2-7a Plant"), HTM 05-02 will be used for the design of plant areas throughout (even in non-patient access areas).
* It is assumed that occupants in the commercial areas and base of the atrium will be independent and present on an intermittent/transient basis. However, it is expected that dependent patients may also use the area, but only when accompanied by a member of staff who can provide assistance in an evacuation scenario. Therefore, for the purpose of designing means of escape, guidance applicable for occupants as dependent will be adopted for these areas.

6 Referenced Drawings and Information

6.1.1 This fire safety statement is based on information made available at the time of writing the report. The drawings used for reference during preparation of this statement can be found within the wider planning application.

7 Fire Safety Features

7.1 Overview

7.1.1 This section provides a summary of the primary fire safety features proposed for the Proposed Development. The following provides an overview for the Proposed Development, in concept only, and will be developed in further detail as the design progresses through the Building Regulations development stages.

7.2 Evacuation Regime

7.2.1 Progressive Horizontal Evacuation (PHE) will be employed throughout the building.

7.2.2 On sounding of the fire alarm the following actions will be taken:

- Patients will be evacuated from an area affected by a fire by staff, through a fire-resisting barrier to an adjoining fire compartment on the same floor. This evacuation regime is designed to protect the occupants from the immediate dangers of fire and smoke. Occupants may remain in these compartments until the fire is dealt with or until instructed to escape vertically through a staircase or adjacent compartment.
- Other people in that compartment will evacuate the building independently. (In non-clinical areas such as education and laboratory spaces, the entire compartment will evacuate the building simultaneously.)
- An alert will sound in adjacent compartments.

7.2.3 Three protected stairs, each with an associated evacuation lift, will be provided.

7.2.4 Patient evacuation between each wing will be available via enclosed bridge links. At this stage it is assumed that escape will not occur through the atrium; they will exit to adjacent compartments and stairs as described in Section 7.4. Occupants located on the central Oriel Connection will evacuate into the ‘boomerang wings’ (see Figure 3-1) before continuing their next stage of evacuation. The stairways in the ‘boomerang wings’ discharge to the outside, either directly or by protected route.

7.3 Detection and Alarm

7.3.1 To facilitate progressive horizontal evacuation, a Category L1 detection and alarm system, designed and installed in accordance with BS 5839-1 (Ref. 15) and HTM 05-03 Part B (Ref. 7), will be provided throughout the proposed building.

7.3.2 The atrium will be designed to ensure that the alarm is audible within all areas of the atrium space. Adequate separation will be provided to ensure there is no sound leakage between the central atrium and adjacent compartments.

7.3.3 Manual call points will be provided at storey exits. Point detection will be provided throughout the building, with the exception of the atrium which will be provided with aspirating point detection.

7.3.4 Void detection will be provided throughout the building in accordance with HTM 05-03 Part B.

7.4 Progressive Horizontal Compartmentation

7.4.1 Currently, the design focuses on the shell and core layout. The next design stage will divide patient access floors into compartments, to facilitate progressive horizontal evacuation.

7.4.2 It is not proposed to use “hospital streets” (as defined by HTM 05-02) for Progressive Horizontal Evacuation (PHE) within this building. Therefore, the proposed building has been designed to meet the following recommendations:

- HTM 05-02 states that a minimum of three exits should be provided from each compartment, two to an adjoining compartment and a third via a route to a stairway or a compartment.
- For a building where a sprinkler system is installed, each compartment should have a minimum floor area of 350 m^2 and a maximum area of 2,000 m^2.
- In a fire emergency each compartment will be capable of accommodating, in addition to its normal occupants, the designed occupancy (including all relevant life support systems) of the most highly occupied adjoining compartment.

7.4.3 Within a typical clinical floor of the Proposed Development, it is proposed that there will be three stair cores and five compartments. Each of these compartments will have three distinct exits, either:

- Two into adjacent compartments and one into a stair (meeting the HTM 05-02 recommendations); or
- Three distinct exits into two different compartments (a departure from the HTM 05-02 recommendations, which recommends three distinct exits into three different compartments).

7.4.4 The departure from the HTM 05-02 guidance is considered to be justified for the following reasons: The general arrangement of the upper floorplate of the Proposed Development is circular in nature. The two ‘boomerang wings’ are connected at each end by enclosed links. Within the fit-out of the clinical floors, circulation routes will be arranged such that a ‘racetrack’ corridor is created through all compartments on any given floor. In compartments where stairs are not located, occupants will always be able to escape away from the fire, around the building into a compartment which contains a stair. This enables the principles of progressive horizontal evacuation to be followed; there is opportunity to evacuate away from a fire horizontally and towards a vertical exit.

7.4.5 The current design features adjacent non-clinical and clinical areas. On the upper non-clinical floors, where the building steps back, escape into the

stairs will be in line with the travel distance requirements for non-clinical spaces (described further in Sections 6.7 and 6.8).

7.4.6 In situations where the clinical and non-clinical compartments are on the same floor, and clinical areas are escaping through non-clinical areas, the means of escape through the non-clinical area must be designed to safely accommodate the evacuation of patients; the escape routes will be designed to accommodate beds/trolleys where appropriate, and the doors should swing in the direction of escape.

7.4.7 In situations where non-clinical areas are required to escape through clinical areas, escape routes will be arranged in the fit-out, that escape is via circulation routes within clinical areas only.

7.4.8 Sub-compartmentation of individual compartments will be provided in accordance with HTM 05-02 recommendations, where the compartment:

a. Has a floor area greater than 750 m^2 (1000 m^2 for outpatient areas);

b. Contains departments to which more than 30 patients will have access at the same time; or

c. Contains sleeping accommodation for more than 30 patients.

7.4.9 Each sub-compartment will be provided with a minimum of two exits to adjoining but separate compartments or sub-compartments. This will be assessed at the detailed design stage, when the department layouts are known.

7.5 Suppression

7.5.1 The building contains a storey of over 30 metres (m) in height; therefore, an automatic suppression system is required. A high-pressure mist system is proposed to provide coverage throughout, including the central atrium space. The system will be designed and installed in accordance with BS 8489-1 (Ref. 16).

7.5.2 The system will be a life safety system fitted with quick response heads, as defined in the Fire Protection Association's 'Loss Prevention Council rules for Automatic Sprinkler Installations'.

7.5.3 Areas in which mist protection is not feasible, such as electrical rooms, will be assessed at stage of design and agreed with the Stakeholders. These rooms may be provided with an alternative to mist, such as gaseous suppression; alternatively, they will be adequately fire separated from the remainder of the building. Areas not covered by the mist system will form part of a fire engineered solution and will require discussion and agreement with the approving authorities.

7.6 Fire Hazard Departments

7.6.1 Fire hazards within the proposed building will be located in accordance with Table 1 of HTM 05-02. Most notably, areas such as the main boiler house, commercial (café and retail) spaces, flammable storage, laundry, local gas stores, main switchgear rooms, main kitchens, main stores, atrium and refuse collection areas are not permitted to be located adjacent (vertically

and horizontally) to very high dependency areas. Fire precautions (fire resisting enclosure and automatic suppression) are to be provided where they are located adjacent to dependent patient areas.

7.6.2 Currently, very high dependency areas (e.g. theatres, as described in Section 4 of this document) are located on the 3rd and 4th floors adjacent to the atrium. The atrium is classified as a hazard department and HTM 05-03 Part M (Ref. 9) guidance will be adhered to. The strategy for the atrium is described further in Section 6.6.

7.7 Travel Distances

7.7.1 Travel distances throughout the building will be assessed based on the use of spaces. HTM 05-02 guidance will be followed when assessing escape from clinical spaces.

7.7.2 HTM 05-02 covers escape from non-clinical areas. It assumes the means of escape will be designed as for patient-areas, but permits the single direction travel distance to be extended to 18 m. ADB guidance will be followed in non-patient access areas, which further restricts the travel distance, but enables the escape distance to be measured to the nearest storey exit instead of the nearest two compartment exits. The guidance proposes that the escape distance is measured to the nearest storey exit or the nearest compartment exit, as the adjacent compartment would be considered a place of relative safety. Further discussion on the level of compartmentation in non-patient areas is given in Section 6.15.

7.7.3 The travel distances which will be used when assessing the fit-out are displayed in Table 6-1. The distances assume the fit-out of the floor is known. If the fit-out is not known, two thirds of the distance should be used.

Table 7-1 Travel distances with respect to different occupancies

Occupancy	Guidance Reference	Single Direction (m)	Multiple Direction (m)
In-patients	HTM 05-02	15	60*
Clinical non-patient areas (staff rooms)	HTM 05-02	18	60*
Office/Laboratories	ADB Vol. 2	18	45
Education	ADB Vol. 2	15	45
Plant	HTM 05-02	12	25
Low Risk Plant	HTM 05-02	25	35
Rooftop Plant	ADB Vol. 2	60	100
Atrium	HTM 05-03 Part M	15	45

* To two adjoining compartments, or an adjoining compartment and stairway/final exit.

7.8 Atrium Escape

7.8.1 HTM 05-03 Part M (Ref. 9) states that a minimum of three exits are required from the atrium base, arranged such that at least two exits remain available in the event of a single fire. Both the travel distance limitations and the number of exits requirement will be achieved via escape through the main

entrances, at opposing ends of the atrium. Additional escape routes are provided via the A&E department and back of house areas.

7.9 Width of Escape Routes

7.9.1 Within departments where beds and patient trolleys are being moved, the width of the circulation spaces required for these activities is to be adequate for escape purposes.

7.9.2 In clinical departments and areas where beds or patient trolleys will not be used, the minimum clear width of escape routes should be:

- For up to 200 people – 1200mm; and
- For over 200 people – an additional 275mm for every additional 50 people

7.9.3 The width of escape routes should be determined by the number of people who would normally be expected to use them in an emergency.

7.9.4 Occupancy calculations will be conducted during the fit-out design stage, for evacuation of the non-clinical areas on floors six to eight. The guidance on Width of Escape Routes and Exits from Section 2 of ADB will be followed.

7.10 Vertical Escape

7.10.1 The building will be provided with three protected escape stairs.

7.10.2 Table 2 of HTM 05-02 states that the minimum number of stairways within a healthcare building is based on the number of patient beds on any one level. For three stairways the maximum number of patient beds is 200. These numbers will not be exceeded on any floor within the hospital.

7.10.3 The stairs are designed, as a minimum, to accommodate assisted patient evacuation plus ambulant passing. The more onerous requirements for stair and landing dimensions to facilitate assisted patient evacuation are:

- Clear landing width of 3800 mm;
- Minimum clear stair width of 1800 mm; and
- Minimum clear landing depth of 1800 mm.

7.10.4 All stairways discharge via protected routes to outside. Any space (rooms or circulation corridor) that is located off these protected routes will be provided with lobbies. The southwest and northwest stairs discharge at lower ground floor. The southwestern stair discharges at ground level.

7.10.5 Occupancy calculations will be conducted during the fit-out design stage, for evacuation of the non-clinical areas on floors six to eight. The guidance on Width of Escape Stairs in Section 3 of ADB will be followed with regard to simultaneous evacuation of these floors.

7.11 Evacuation Lifts

7.11.1 The Draft London Plan requires at least one lift per core to be designed as a suitably sized fire evacuation lift suitable to be used to evacuate people who require level access from the building.

7.11.2 Each stair core will be provided with an evacuation lift, suitable for the vertical transportation of patients. The lifts will be designed to comply with the guidance in HTM 05-03: Part E (Ref. 8) and BS 5588-8 (Ref. 14) and HTM 08-02 (Ref. 11) as well as BS EN 81-76.

7.11.3 It is noted that the Greater London Authority London Plan Guidance Sheet Policy D5(B5) which was Published in March 2021 states that firefighting lifts cannot be used as evacuation lifts. The design of the lifts was developed for this scheme before this guidance was published as such it originally intended to have dual use evacuation and firefighting lifts. However, it is now proposed that the RIBA stage 4 design will include the provision to upgrade the goods lifts in the North-east and South west cores into dual use goods/evacuation lifts. The lifts within the scheme are detailed in the figure below.

Figure 7-1 Lifts

7.11.4 The evacuation lifts will exit via a level lobby protected corridor at the shafts final exit level. 120-minute side guided curtain will be provided to the loading bay side of the north east core at ground level to maintain the integrity of the shaft.

7.11.5 Evacuation lifts are suitably sized for the evacuation of all occupants. They will be provided with a cause-and-effect interface between the lift control system and the fire detection and alarm system to support the evacuation strategy. Emergency intercom/ communication system will be provided to communicate with the fire control center. Dual power supply will be provided to the lift to enable the lift to remain in use throughout the evacuation process.

7.11.6 Operational procedures will be developed for trained staff to assist them in managing and using the lift in an emergency situation.

7.11.7 The provision of Goods/Evacuation lifts in the North-east and South west cores ensures that each core is provided with an evacuation lift and therefore meets the intent of the London Plan.

7.12 Final Exits

7.12.1 Final exits will be required on the perimeter of the building to ensure travel distances comply with the recommendations above. The final exits will be designed so as to not present an obstacle to mobility impaired people. Where there is a need to traverse steps, ramps will be provided. Final exit doors will open onto an area which is level for a distance of at least 1 m.

7.12.2 Guidance recommends that where an external escape route is within 1800 mm of an external wall of the building, that part of the external wall should be made of fire-resisting construction, up to one storey height. The proposed arrangement would include an escape along the façade of the building upon exiting the northern core as the route is within 1800 mm this section of façade shall be constructed of fire resisting construction achieving the same standard as the protected stair, i.e. 120 minutes (Loadbearing (R), Integrity (E) and Insulation (I)).

7.13 Emergency Lighting and Signage

7.13.1 Emergency lighting will be provided in line with the recommendations of BS 5266-1 (Ref. 12), HTM 06-01 (Ref. 10) and CIBSE LG02 (Ref. 5). Emergency signage will be provided in line with the recommendations of BS 5499-4 (Ref. 13) and BS ISO 3864-1 (Ref. 23).

7.14 Power to Life Safety Systems

7.14.1 All life safety systems will be provided with dual power supply.

7.15 Internal Fire Spread (Linings)

7.15.1 All linings for walls and ceilings shall meet the following classifications as defined in HTM 05-02:

- Small rooms (not more than 4 m^2) - National classification 1;
- Circulation spaces - National classification 0; and
- Other rooms - National classification 0.

7.16 Structural Fire Resistance

7.16.1 As the building has a storey that is greater than 30 m in height, all loadbearing elements of structure shall have minimum 90 minutes (loadbearing (R)) fire resistance rating, in accordance with Table 5 of HTM 05-02.

7.16.2 As the roof supports an escape route (roof terrace, rooftop plant), structural fire protection is required to members that support the roof.

7.17 Compartmentation

7.17.1 Fire resisting compartmentation will be used throughout the building to separate all storeys, departments, bridge links and the atrium.

7.17.2 Table 6-2 illustrates the fire resistance requirements for various components in the building.

Table 7-2 Compartmentation requirements

Component	Loadbearing Capacity (R)	Integrity (E)	Insulation (I)	Method of Exposure
PHE Compartment walls*	-	60	60	Each side separately
PHE Sub-compartment walls	-	30	30	Each side separately
Dead end corridors	-	30	30	Each side separately
Protected Shafts, including Services risers and lifts that are not within a firefighting shaft	90	90	90	Each side separately
Protected Lobbies to lifts not within a firefighting shaft	60	60	60	Each side separately
Firefighting shafts	120	120	120	From side remote from shaft
Construction separating the firefighting shaft from the building	60	60	60	From shaft side
Construction separating the firefighting stairway from the firefighting lift shaft and firefighting lift lobby	60	60	60	Each side separately
Hazard Departments (areas listed in Table 1 of HTM 05-02)	60	60	60	Each side separately
Day rooms	30	30	30	Each side separately
Server / Comms room	60	60	60	Each side separately
Atrium Enclosure	-	60	60	Each side separately
Compartment floors **	90	90	90	From the underside
Life Safety Plant	120	120	120	Each side separately

* This may be reduced to 30 minutes, in accordance with HTM 05-02 for sprinklered buildings, or retained at 60 minutes as preferred by some Trusts. This will require consultation with the Trust. The 60 minutes currently proposed is as an enhancement on the HTM 05-02 guidance.
**This includes the floor of the rooftop terrace and plant.

7.17.3 Fire hazard rooms will be enclosed in accordance with HTM 05-02 recommendations, subject to a risk assessment being provided to demonstrate that protection is not required. At this stage the research spaces and commercial enterprises are classified as fire hazard departments.

7.18 Fire stopping

7.18.1 30/15 E/I fire-resisting barriers will be provided to subdivide concealed roof or ceiling voids, so that the maximum dimension of uninterrupted roof or ceiling void should not exceed 20 m. Wherever possible, cavity barriers should be positioned to coincide with fire-resisting walls.

7.18.2 30/15 fire-resisting cavity barriers will also be provided in the following situations:

a. To prevent the interconnection of vertical and horizontal cavities;

b. At the intersection of fire-resisting construction and elements containing a concealed space;

c. Within the void behind the external face of rain-screen cladding, at every floor level and on the line of compartment walls abutting the external wall.

7.18.3 Compartment walls shall be taken up to the underside of the roof covering or deck, and fire-stopped to maintain the fire resistance. HTM 05-02 recommends that a 1.5m zone of the roof either side of the wall should have a covering of designation AA, AB or AC on a substrate or deck of a material of limited combustibility.

7.18.4 Firestopping, including the provision of dampers within ductwork, will be provided in accordance with Chapter 5 of HTM 05-02.

7.19 External Fire Spread

7.19.1 The Proposed Development is bounded on two sides by single carriageway roads (St Pancras Way and Granary St) and access routes to the south and east.

7.19.2 With regards to fire spread, the “relevant boundary” for external fire spread, as defined by HTM 05-02, is:

- The centre line of a public road, river or railway;
- The site boundary; and
- A boundary agreed between buildings on the same site, with the same ownership; it is typically half-way between buildings.

7.19.3 For the Proposed Development, the centreline of the adjacent roads have been adopted as the relevant boundaries.

7.19.4 Within the Site boundary, no part of the building falls within 1 m of the relevant boundary. This should be maintained to ensure the wall is not fire resisting from both sides.

7.19.5 Detailed external fire spread calculations will be carried out at the detailed design stage once the internal compartmentation layouts are confirmed. The external fire spread from the east side on the building will be assessed to the relevant boundary which will fall in the middle of the access road that is to be created along this side of the building. Internal compartmentation

will be utilised to limit the required areas of fire resisting façade. This will take into account the provision of suppression.

7.19.6 As the building is greater than 18m in height and contains a sleeping risk it is classified as a relevant building. Therefore, materials which become part of an external wall, or specified attachment, shall be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1:2007+A1:2009 (Ref. 22).

7.19.7 In accordance with HTM 05-02, as the building provides in-patient facilities, the roof coverings will be in accordance with ADB.

7.20 Firefighting Shafts

7.20.1 In accordance with HTM 05-02, sprinklered healthcare buildings over 18 m in height should be provided with at least three firefighting shafts, plus an extra shaft for every 1500 m^2 that the floorplate exceeds 3300 m^2.

7.20.2 As the building is over 18 m in height and has a floor area of in excess of 4800m^2 the building should be provided with four firefighting shafts in accordance with Table 11 of HTM 05-02. In the current arrangement only three firefighting shafts are provided. This is a deviation from guidance which is justified as follows.

7.20.3 A typical upper floor, in which the firefighting shafts will be used to fight the fire, has a total gross internal area (GIA) of roughly 5,000 m^2 due to the large atrium opening. This is 200 m^2 over the 4,800 m^2 HTM 05-02 threshold for a fourth firefighting shaft. This is a small (4%) increase in total area when compared to a code compliant three firefighting shaft arrangement.

7.20.4 Further, guidance generally recommends additional firefighting shafts so that the fire brigade has sufficient coverage across each floorplate, forming a safe bridgehead area within a firefighting shaft. The level of coverage across a floorplate for the fire brigade is rationalised via the hose laying distance. The 60 m hose laying distance will be adhered to during the fit-out design; as such, it is believed that the intent of the HTM 05-02 has been achieved within the proposed building. Therefore, another firefighting shaft, in this instance, would not be needed to provide compliant coverage of on floor firefighting provisions.

7.20.5 Each firefighting shaft is to be provided with:

- Vented firefighting stair;
- Firefighting lift;
- Ventilated firefighting lobby; and
- Dry riser designed in accordance with BS 9990 (Ref. 17).
- Each of the current firefighting shafts containing a firefighting lift, which goes beyond the minimum code requirements, as HTM 05-02 requires one firefighting lift only. Fire-fighting lift installations should conform to BS EN 81-72 (Ref. 20) and to BS EN 81-1 (Ref. 18), or BS EN 81-2 (Ref. 19) depending on the particular type of lift.

7.20.6 In addition, a Fire Control Centre (FCC) will be provided at the Lower Ground level, accessed directly off the fire brigade access route. This will enable the fire brigade to assist the premises management to control an incident immediately on arrival to the building. The provision of an FCC within this building is above the HTM 05-02 requirements. The FCC will be enclosed in 120 minutes fire resisting construction (REI).

7.20.7 For the three firefighting shafts, where there is direct access the route will be enclosed in 120 min (REI) construction. Any accommodation off the corridor will be lobbied. The protected corridors will be below the 18 m access limitation as defined in HTM-05-02.

7.21 Fire Brigade Access

7.21.1 Fire brigade vehicle access routes will be provided to all four sides of the building via existing roads and access routes to the east and south of the building. All fire brigade vehicle access routes will be designed in accordance with Table 10 of HTM 05-02.

7.21.2 Fire brigade rendezvous points will be determined in the detailed design stage.

7.21.3 The fire main inlets are to be located on the face of the building, within 90 m a fire hydrant and within 18 m and visible site of the fire appliance parking position. The fire main outlets will be within the firefighting lobbies.

7.22 Basement Smoke Venting

7.22.1 The areas of Lower Ground that are below 1,200 mm, relative to the adjacent ground, are highlighted in yellow and blue in Figure 6-1. These areas will be considered as a basement floor, which require a means of ventilation.

7.22.2 The areas highlighted in blue will be provided with a mechanical smoke extract system, designed to provide ten air changes per hour and capable of handling gas temperatures of up to 300ºC. The ductwork which forms part of the ventilation system should be integrity and insulation fire rated to the level of the wall in which it passes through, in accordance with BS EN 1366-8 (Ref. 21). The area will be divided into smoke zones during the next stage of design. Alternative solutions for the areas that will not be covered by the mist system will also be discussed at this design stage.

7.22.3 The cycle store highlighted in yellow, will be provided with a natural ventilation system, as it features doors to the outside which can be used for post-fire smoke clearance.

Figure 7-2: Configuration of lower ground floor ventilation

7.23 Atrium Smoke Ventilation

7.23.1 The inclusion of an atrium within the building increases the potential that fire and smoke may rapidly spread beyond the initial incident of fire. The complex geometry of the proposed atrium requires a detailed Computational Fluid Dynamics (CFD) study in order to determine the required fire separation and smoke control provisions.

7.23.2 CFD modelling for the atrium volume is ongoing during this design period, and will be completed at a later design stage.

7.23.3 Presently, a natural smoke extraction system is proposed, with horizontal vents in both tiers of the atrium roof. Inlet air at the base of the atrium will be provided via a combination of natural airflow from ductwork and open doors, boosted by mechanical inlet into the atrium base.

7.23.4 The following limiting conditions for tenability, caused by heat and smoke, will be used to determine the provisions for the smoke extraction system:

- Maintaining a steady buoyant layer using the most onerous of the following standards:
  - At least 1 m above the uppermost opening in the atrium enclosure; and
  - At least 3 m above the balcony or bridge level with the temperature of the smoke layer of 200ºC, for at least the period required to evacuate any occupants of the balcony or bridge.
- Air velocity for replacement air inlets should not exceed 2 m/s in areas where occupants may be escaping.

7.23.5 If the temperature of the smoke layer above the balcony or bridge exceeds 200ºC, then CFD analysis will assess if all occupants of the balcony or bridge could be evacuated safely before they are affected by the radiative effect of the smoke layer.

7.24 Fire Safety Management

7.24.1 Regulation 38(2) of the Building Regulations requires evidence of suitable provision to maintain the fire precautions, regimes and systems in support of the fire strategy. The issues that will require maintenance in this context are outlined below.

7.24.2 In designing the fire precautions, recognition should be given to the need for maintenance, including suitable access to hardware.

7.24.3 British Standards include recommendations for the maintenance of fire precautions, and these should be followed, with relevant issues highlighted in the building Health and Safety Manual.

7.24.4 In addressing these issues, the management aspects required to be highlighted under the FSO are identified.

Fire Risk Assessment

7.24.5 The FSO requires the premises to be overseen by a 'Responsible Person' whose responsibilities include the conducting and maintaining a Fire Risk Assessment.

7.24.6 In carrying out their duties, the Responsible Person may enlist the services of a competent person to ensure fire precautions measures are adequately maintained. In most instances regular testing and inspection of some hardware could be carried out in-house; however, inspection and servicing of sophisticated installations, such as the automatic alarm and detection system, may require the assistance of a competent person. The FSO defines this as a person who has 'sufficient training and experience or knowledge and other qualities to enable him properly to assist in undertaking the preventive and protective measures'.

7.24.7 Maintenance of the following plant and equipment is required in accordance with the FSO:

- Detection and alarm system;
- Fire panels;
- Fire dampers and associated ductwork; and
- Fire-stopping.

7.24.8 Further guidance is found in the Fire Safety Risk Assessment guides issued by the Department for Communities and Local Government.

Fire Strategy Management Assumptions

7.24.9 Regulation 38 to the Building Regulations requires fire safety information to be given to the Responsible Person at completion of the project when the building is first occupied, including management assumptions in the fire

strategy – which the Trust will provide as a minimum. The following list highlights the key assumptions made in this Fire Safety Statement report:

- An evacuation management plan will be developed in accordance with the means of escape section of this strategy. Evacuation of the building will be well managed, with a written evacuation plan and management procedures.
- Staff will be trained regularly to a high level of fire safety management and with an understanding of the fire evacuation strategy in place. This will be achieved by assigning floor wardens and regular drills in which the necessary evacuation equipment are used. It is the responsibility of management to ensure that adequate numbers of staff will always be available and to devise suitable arrangements to provide for the safe evacuation of all relevant persons in accordance with the emergency evacuation plan.
- First aid fire points including extinguishers will initially be located towards each storey exit. Further fire points should be introduced by the occupier as part of the FSO risk assessment.
- Management will need to ensure that storage is contained in dedicated spaces.
- Management will notify the fire service in the event of alarm activation. The alarm system will be set to automatically notify the main reception, staffed 24/7, who will call the fire brigade.
- First aid firefighting and fire muster points should be introduced as part of the FSO risk assessment and will be coordinated with the architect, even if not designed until the fit-out stage.

7.24.10 Suitable fire safety management and evacuation drills should be undertaken and documented with staff trained in the procedures to be followed for a given fire scenario.

8 Conclusion

8.1.1 This statement has outlined the fire safety strategy principles for the Proposed Development. The fire safety features described herein will be further developed and incorporated into the design and specifications during the coordination and technical design stages.

8.1.2 As the design progresses formal consultation with the ‘Stakeholders’, will occur as part of the Building Regulations process. The purpose of consultation is to gain acceptance for the scheme proposals and the proposed methodology for demonstrating regulatory compliance is/ can be achieved.

9 References

Ref. 1. The Building Regulations 2010, Schedule 1, Part B
Ref. 2. Construction Design and Management Regulation (CDM) 2015
Ref. 3. Regulatory Reform (Fire Safety) Order 2005 (FSO)
Ref. 4. Approved Document B, Volume 2: Buildings other than dwellings 2019
Ref. 5. CIBSE LG02: Lighting for healthcare premises 2019
Ref. 6. Health Technical Memorandum 05-02: Firecode - Guidance in support of functional provisions (Fire safety in the design of healthcare premises) 2015
Ref. 7. Health Technical Memorandum 05-03: Operational provisions – Part B: Fire detection and alarm systems 2006
Ref. 8. Health Technical Memorandum 05-03: Operational provisions – Part E: Escape lifts in healthcare premises 2006
Ref. 9. Health Technical Memorandum 05-03: Operational provisions – Part M: Guidance on fire safety of atria in healthcare buildings 2013
Ref. 10. Health Technical Memorandum 06-01: Electrical services supply and distribution 2017
Ref. 11. Health Technical Memorandum 08-02: Lifts 2016
Ref. 12. British Standards 5266-1: Emergency lighting – Part 1: Code of practice for the emergency lighting of premises 2016
Ref. 13. British Standards 5499-4: Safety signs – Part 4: Code of practice for escape route signing 2013
Ref. 14. British Standards 5588-8: Fire precautions in the design, construction and use of buildings – Part 8: Code of practice for means of escape for disabled people 1999
Ref. 15. British Standards 5839-1: 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 2017
Ref. 16. British Standards 8489-1: Fixed fire protection systems – Industrial and commercial watermist systems – Part 1: Code of practice for design and installation 2016
Ref. 17. British Standards 9990: Non-automatic firefighting systems in buildings – Code of practice 2015
Ref. 18. British Standards EN 81-1: Safety rules for the construction and installation of lifts – Part 1: Electric lifts 1998
Ref. 19. British Standards EN 81-2: Safety rules for the construction and installation of lifts – Part 2: Hydraulic lifts1998
Ref. 20. British Standards EN 81-72: Safety rules for the construction and installation of lifts – Particular applications for passenger and goods passenger lifts – Part 72: Firefighters lifts 2015
Ref. 21. British Standards EN 1366-8: Fire resistance tests for service installations – Part 8: Smoke extraction ducts 2004
Ref. 22. British Standards EN 13501-1+A1 – Fire classification of construction products and building elements – Part 1: Classifications using data from reaction to fire tests 2007/2009
Ref. 23. British Standards ISO 3864-1: Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings 2011