Project85 Gray's Inn RoadSubjectFire StrategyTopicPlanning StatementDate15<sup>th</sup> July 2021AuthorYen Luong - DirectorRevision1ReviewedFrances Radford – Senior Fire Engineer



## 1 Introduction

The London Plan (2021) Policy D12 requires development proposals to achieve the highest standards of fire safety, embedding these at the earliest possible stage. Policy D5 also requires specific attention to the requirements for evacuation lifts, which form part of the fire safety features of the project.

Therefore, all development proposals should be submitted with a Fire Statement.

A Fire Statement is a standalone document which defines the fire safety objectives and performance requirements of a development, and the methods by which these objectives will be provided/ satisfied. This is based on the Draft Fire Safety Guidance (pre-consultation version) provided by the GLA for the London Plan (2021) with regards to fire safety.

The Fire Statement should evidence the provisions made for the safety of occupants and protection of property as well as the provision of suitable access and equipment for firefighting in light of the London Plan (2021) fire safety policy requirements and the justification for these measures.

The Fire Surgery Ltd are the Fire Consultant for the refurbishment and extension of 85 Gray's Inn Road and are developing the overall fire strategy which includes the proposed new and refurbished areas.

The Fire Surgery Ltd confirm that the fire safety of the proposed development and the fire safety information satisfies the requirements of London Plan (2021) Policy D12A.

### 2 Competency Statement

Paragraph 3.12.9 of Policy D12 explains that Fire Statements should be produced by someone who is: "third-party independent and suitably-qualified". The Fire Surgery competence along with the fire engineers working on the scheme is provided below.

The Fire Surgery is an award-winning independent Fire Engineering design consultancy based in London. The company is a proud member of the Fire Engineering Council for the Fire Industry Association by virtue of the Chartered Engineering status of its engineers and also its ISO 9001 accreditation for Quality Management.

The specialist fire and risk consultancy team come from a varied background including mathematicians, a Chartered physicist, 5 Chartered Engineers and a management consultant who specialises in business continuity. Members of the Fire Surgery team also contribute regularly to the development and writing of fire safety standards and industry best practice guidance, including *BS7974; Application of fire safety engineering principles to the design of buildings – Code of practice (2019)*, in which competency plays a fundamental part.

The Fire Surgery specialises in the development of fire strategies for office buildings in central London. The Fire Surgery has a proven track record for securing Building Regulations approvals on a number of high profile new offices and refurbished offices in London having a strong working relationship with Local Authority Building Control and London Fire Brigade Fire Engineering Team.

Recently completed office building fire strategies include:

- 4 Kingdom Street with Allies and Morrison for British Land.
- R7 Kings Cross with Duggan Morris for Argent.
- S1 Kings Cross with Mossessian for Argent.
- S9 International Quarter London with RSHP for Lend Lease.
- 100 Cheapside with EPR.
- 50 Victoria Embankment with Fletcher Priest.

#### 2.1 The Fire Engineers

**Yen Luong** Bsc(Phys), MSc (Fire Engineering), CPhys, MIPhys, MIFireE is a Director of The Fire Surgery. She is a Chartered Physicist and Fire Engineer with 25 years' experience with Fire Engineering design. She has a specialist fire engineering Master's degree from the University of Ulster.

Yen has worked in the UK and internationally as a professional fire engineer including Hong Kong, Australia and America. She was an Executive Director at Goldman Sachs, an investment bank with responsibility for operational fire safety in the Asia and Australia regions and spent a number of years in the fire consulting arm at CSIRO, Australia's commonwealth fire research establishment.

**Frances Radford** MEng, CEng, MIFireE graduated from the University of Edinburgh in 2012 with a Master's degree in Structural and Fire Safety Engineering. Frances has since worked as a fire engineer on large scale projects in the UK and the Middle East, gaining chartership with the Institution of Fire Engineers in 2018. As a Senior Engineer with The Fire Surgery, Frances has led fire engineering input on a variety of projects, including offices, performance venues and heritage buildings.

## 3 Building Description

85 Gray's Inn Road is an existing office building in the Bloomsbury district of London. The building can be accessed off Gray's Inn Road as well as Roger Street in the London Borough of Camden.

The project involves alterations and extension of building to rear at ground to level 4, installation of fume extract and mechanical plant, front entrance canopy and associated alterations and infrastructure work.

A proposed section of the building is provided in Figure 1.



Figure 1- Proposed elevation of 85 Gray's Inn Road

The primary use of the building will be for high quality office accommodation aimed at the growing needs of the life science sector. The building was originally constructed in 1992 and is set over 6 storeys including a basement, ground and 4 floors above ground. The basement, ground and 4 upper floors will contain ancillary accommodation (plant space) and office areas. A terrace and open-air plant, within an enclosure, are proposed at roof level.

85 Gray's Inn Road is circa.18.7m in height, measured from ground floor access level to the finished floor level (FFL) of the roof terrace in accordance with BS 9999. The floor to floor heights in the building is 4.5m at ground floor and 3.6m on other floors including the basement.

The height to the fourth floor (highest internal occupied level) for firefighting access level is 15.3m. This height will determine the minimum structural fire resistance and compartmentation requirements for the building.

The basement and upper levels of the building, including the roof terrace, are served by two stairs (Stairs 1 and 2), as shown in Figure 2. Stair 1 is part of a firefighting access stair.



Figure 2 - Stairs serving the upper floors of 85 Gray's Inn Road (Second floor shown)

## 4 Fire strategy objectives

The objectives of the fire strategy are to initially satisfy the requirements of London Plan (2021) Policy D12 for the planning application. Ultimately the design will meet the functional requirements of Part B of the Building Regulations 2010. This is concerned with life safety of the occupants and facilitating adequate fire service access.

The fire strategy considers single accidental fires of those associated and most likely to occur in an office/ place of public assembly building.

The main principles of the fire strategy are to demonstrate that building occupants can escape into a place of relative safety and evacuate the building to an ultimate place of safety. It also demonstrates that there are reasonable facilities provided to ensure that the fire service can access and commence firefighting operations in the event of a fire incident.

### 5 Guidance documents

BS 9999:2017 has been applied as the principal fire safety design guidance benchmark for this project.

## 6 The building's construction method and products and materials used

The existing building structure is reinforced concrete including the floors, columns and cores.

Elliot Wood had undertaken some investigative structural opening up work which has exposed the existing concrete structure in more detail. Given the evidence on site, the engineers it is believed that the existing structure is sufficient for a 60 minute fire resistance.

Whilst the age of the property is uncertain, but it is feasible it was designed to British Standards (BS) not Eurocodes (EC), as such the structure was reviewed against BS 8110-1:1997 (concrete code) instead of the current standard.

The external existing façade are to be retained, with some or all of the windows replaced.

## 7 Means of escape for all building users and evacuation strategy

The means of escape has followed the principles in BS 9999 2017. Where provisions exceed the minimum recommended standards in BS 9999, <u>this has been highted in underlined text</u>.

### 7.1 Evacuation Strategy

A simultaneous evacuation strategy will be implemented in all areas of the building. A simultaneous evacuation strategy means that in the event of a confirmed fire signal and the sounding of the fire alarm, all persons are expected to evacuate the building.

### 7.2 Fire detection and alarm

85 Gray's Inn Road will need to be provided with an automatic fire detection and alarm system to a minimum Category L2 level of coverage to BS5839: pt. 1 2017.

This is an improvement on the minimum standards which only require manual call points in offices.

### 7.3 Occupant numbers

The occupancy of the building has been based upon relevant BS 9999 floor space factors. The typical office floor area is 430m<sup>2</sup> which suggests 71 people per floor based on 6m<sup>2</sup>/person.

#### 7.4 Escape stairs

Two protected staircases are provided with a clear width of 1200mm each. Both the stairs discharge directly to outside, with Stair 1 discharging at ground level to Gray's Inn Road and Stair 2 discharging to Brownhow Mews. Stair 2 is not lobbied so only one stair capacity can be considered which is 558 over 5 floors including the roof terrace. This is an average of 111 people per floor. This is more than the expected numbers of people per floor.

#### 7.5 Travel distances

The travel distances limitations are within the recommendations of BS 9999 2017 for offices which is 55m in two directions and 22m in a single direction. The travel distances for the second floor are shown below (typical upper floor).



Figure 3 – Indicative travel distances on the second floor

Each floor is provided with two exits (Stair 1 and Stair 2). The exits into both stairs are sized at least 800 mm wide.

One of the exits is discounted in the exit capacity calculations as it is considered it is compromised by a fire on the floor. BS9999 requires that all exits under 1050mm should be considered as 500mm when calculating the capacity. Therefore, using a minimum exit width of 3.6mm/person, the capacity of the remaining exit is calculated to be 138 people. This is greater than the calculated theoretical occupancy on each floor. Therefore this is acceptable.

## 8 Evacuation for people with disabilities and the use of Evacuation Lifts

Policy D5 of the London Plan requires the highest standards of accessible and inclusive design to be met.

Policy D5(B5) requires development proposals to be designed to incorporate safe and dignified emergency evacuation for all building users. In all developments where lifts are installed, as a minimum at least one lift per core (or more subject to capacity assessments) should be a suitably sized fire evacuation lift suitable to be used to evacuate people who require level access from the building.

A refuge has been provided in Stair 1 lobby at each level. The refuge is 900 x 1400mm and clear of the escape from other people. Emergency Voice Communication (EVC) systems to BS5839-9 (2011) are provided at each refuge.

In addition, Stair 1 is a fire fighting stair and incorporates an escape stair with unvented lobby and a dry riser outlet in the lobby. This lift will also be upgraded to be used as an evacuation lift. The cause and

effective of the lift will allow staff to take control of the lift and facilitate the escape of those with mobility impairments on the upper floors in Stair 1.

This meets the requirements of the Policy D5 (B5).

Stair 2 does not have a lift core, and does not have a lobby or space in the stair landing for a disabled refuge in this stair, this is an existing condition which is proposed to be retained.

### 9 **Passive and active fire safety measures**

BS 9999 2017 has been used in the choice of active and passive fire safety systems in the building. A list of those measures is provided below:

- A Category L2 automatic fire detection and alarm system coverage to BS5839 pt. 1
- Emergency Voice Communication systems in refuges to BS 5839 part 9.
- Loadbearing elements of structure protected to a minimum 60 minutes fire resistance.
- Basement smoke ventilation is achieved through natural ventilation.
- A firefighting access stair to BS 9999, including escape stair, unvented lobby and dry rising fire main.
- Secondary power supply to life safety and firefighting systems, in line with BS8519: 2010.
- Emergency lighting to be provided to BS5266-1.
- Dry rising main installation in the firefighting shafts, to BS9990: 2015.
- Evacuation lift to BS9999: 2017.
- Adequate fire hydrant coverage to be provided to the building.

### 10 Access and facilities for the fire and rescue service

The building will be provided with an escape stair with unvented lobby with dry riser as per BS 9999 since the building height is 15.3m and under 18m.

Premises information for firefighters will be provided at the entrance to the fire access core. This will contain all the key information on fire safety for the building for use by the fire service. It will be updated by the management of the building and this is written into the fire strategy to allow ongoing fire safety management responsibilities.

There is adequate coverage for fire hoses across all floor plates within 45m.



Figure 4 – Indicative hose coverage on a typical office floor

## 11 Site access for the fire and rescue service

Fire service vehicle access to 85 Gray's Inn Road is facilitated by Gray's Inn Road, which is an existing roadway.

The fire service are required to park within 18m of the dry riser inlet to the building. This is possible for 85 Gray's Inn Road. The above provisions do not adversely impact on neighbouring sites and access to the surrounding areas as shown below.

## 12 Future development of the asset and the 'Golden Thread' of information

The Independent Review of Building Regulations and Fire Safety was commissioned by government following the Grenfell Tower fire to make recommendations on the future regulatory system. The report, chaired by Dame Judith Hackitt, is entitled *Building a Safer Future (2019)* and provides recommendations in section 5 on the competency of those operating within the fire safety framework and requires overall consistency in fire safety from initial design through to occupation and future management. This is commonly referred to as the "Golden Thread"

Whilst this report is primarily written in the context of high rise residential and complex buildings, there are common recommendations which are applicable throughout the fire safety and construction industries.

The following information outlines how The Fire Surgery will consider the Golden Thread in the context of fire safety in Holbein Place.

### 12.1 RIBA design stages

The Fire Surgery were appointed at RIBA Stage 2 where a detailed fire strategy was produced to outline the main concerns and coordinate the design with the team.

The Fire Surgery have a continued appointment through RIBA Stage 3 Developed Design to maintain the agreed principles of the fire strategy.

Should the project be successful through planning, then The Fire Surgery are likely to be retained for RIBA Stage 4.

### 12.2 Construction Monitoring & Practical Completion

For fire safety design in buildings, it is important to monitor the procurement and construction of the fire strategy to ensure that the approved fire strategy is designed and actually constructed as intended.

The detailed design of active fire systems will be important, including the commissioning and testing of the systems.

Locations of passive fire protection sometime change. Therefore, having the project fire engineer appointed during the tender, contractor lead designs and construction can ensure a smoother route to practical completion. The contractor has an obligation under Regulation 38 (formerly 16B) of the Building Regulations 2010 to hand over all fire related information for the project to the client, in order to allow them to manage the building successfully under the Regulatory Reform (Fire Safety) Order 2005.

This will require an as built fire strategy report that reflects the actual building constructed. It will be necessary for the contractor to update the design fire strategy as this stage.

The Fire Surgery could undertake this work on behalf of the contractor for the duration of RIBA Stage 5.

#### 12.3 Fire Safety Management

Fire safety in buildings is a balance between the technical systems within the building and how the building is then used and managed. It is not possible to rely solely on the technical provisions in the building, and an active role on the part of the management is essential. It is therefore necessary that the building is used as intended in this report and that the systems are managed appropriately.

As with all buildings, there will be standard fire safety management requirements for the day to day operation of the building. It is a fundamental assumption that features described within this fire strategy will require management and maintenance throughout the life of the building.

Managing fire safety is a process that lasts throughout the life of a building, starting with the initial design, which is intended both to minimize the incidence of fire and to ensure that if a fire does occur, appropriate fire safety systems (including active, passive and procedural systems) are in place and are fully functional.

Effective management of fire safety can contribute to the protection of the building occupants in many ways:

- By working to prevent fires occurring in the first place,
- By monitoring the fire risk on an on-going basis and taking appropriate action to eliminate or reduce risk,
- By ensuring that all the fire safety measures in the building are kept in working order and that the means of escape are always available,
- By providing adequate means for the fire service to effectively gain access to the building should a fire occur,
- By updating the Fire Strategy for changes in the use of the building.

Upon completion, the building owners or managers (including tenants) will need to undertake fire risk assessments and have these available for inspection by the fire service at any time. This should typically be undertaken annually by a competent person or when there are significant changes in the building and is carried out to ensure that the fire strategy is upheld throughout the life of the building and that the risk of fire is kept low.

To assist with the ongoing fire safety management, The Fire Surgery have developed a strategy of using coloured text in the fire strategy reports that highlights items/ issues that need to be considered specifically by the fire safety management and as part of any fire risk assessments for this building.

For this specific building, management areas that are of particular importance for the longevity of the proposed fire safety design solution include:

- Implementation and maintenance of an 'Adequate' fire safety management Level 2 system to BS 9999: 2017 by all responsible persons for the building.
- Disabled person evacuation procedures.
- Allocation of appropriate assembly points.
- Management, monitoring, and maintenance of all fire safety systems, and in particular the automatic fire detection and alarm systems, the mechanical smoke ventilation systems, and the fire main.
- Provision of appropriate premises information for the fire service.
- Co-operation and co-ordination between the responsible persons for the building (landlord/ tenants) in regard to fire safety matters relevant to the building, including ensuring that emergency plans are co-ordinated and consistent with one another.
- Maintenance of the irrigation system to the green wall.

### 13 Summary

This report has been produced to support the planning application for 85 Gray's Inn Road. The report is a fire statement as required by the London Plan Policy D12 which requires development proposals to achieve the highest standards of fire safety, embedding these at the earliest possible stage.

This Fire Statement is a standalone document which defines the fire safety objectives and performance requirements of a development, and the methods by which these objectives will be provided/ satisfied.

The Fire Statement has evidenced the provisions made for the safety of occupants and protection of property as well as the provision of suitable access and equipment for firefighting in light of London Plan fire safety policy requirements and the justification for these measures as described below:

- The fire statement and subsequent fire strategy for 85 Gray's Inn Road has been developed by competent fire engineers who are Chartered with The Institution of Fire Engineers.
- The fire safety objectives have been identified which include the clients fire safety policy and the Building Regulations performance requirements.
- The fire safety guidance documents used have been identified which included BS 9999 2017.
- The building materials have been identified which include the existing concrete frame.
- The safe means of escape has been documented including the simultaneous evacuation strategy. There are an adequate number and location of escape stairs for the anticipated occupancy.
- The means of escape for wheelchair users has been clarified including the use of a new evacuation in stair 1 to satisfy the London Policy D5(B5).
- The access and facilities for the fire service has been established including an escape stair with unventilated lobby and dry fire main.
- It is possible to reach the firefighting shaft within 18m of the roadway where the fire appliance will park. The firefighting provisions do not adversely impact on neighbouring sites and access to the surrounding areas.
- The consistency in fire safety has been demonstrated to meet the Golden thread by virtue of The Fire Surgery's involvement in the development of the fire strategy and the future appointments through construction to support regulation 38 of the building regulations and allow the users of the building to execute their responsibilities for fire safety under the Regulatory Reform (Fire Safety) Order 2005 which is the legislation for fire safety in occupied buildings.

The Fire Surgery believe this fire statement meets the requirements of the London Plan (2021) Policy D12.