MARSHALL FIRE

Title:	Project 3 Norfork House Fire Strategy Report
Revision:	00
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00	RIBA Stage 4 Initial Issue	Daniel Taylor	Steven Marshall	8th October 2021

Contents

1. Executive Summary

The proposals outlined in this document are considered to demonstrate a level of fire safety equal to or greater than the general standard implied by compliance with the recommendations in Approved Document B. This level of safety therefore satisfies the functional requirements of Part B of the Building Regulations.

The following project is an existing listed office building and therefore has limitations as to the amendments possible in order to meet the current guidance. It is proposed to carry out a refurbishment and remove internal partitions on the floor levels creating an open plan floor plate. With respect to the site constraints and where improvements can be achieved to compensate against any deviations it has been done with a view to protect means of escape and firefighting.

The fire strategy described in this report can be summarised as follows (note this is not an exhaustive list but outlines the main fire safety requirements. Please read the remainder of the report for the full requirements):

- A Category L1 fire alarm system consisting of fire detection throughout the building in accordance with BS5839-1.
- It is proposed that the building will operate a simultaneous evacuation regime and therefore in the event of a fire the building will be evacuated in full. It is not currently proposed to incorporate an investigation period given the nature of the building.
- The occupancy is based on $6m^2$ per person for an office layout.
- The maximum recommended travel distances where the layout is known for an office is 18m in a single direction and 45m where more than one direction of escape is available.
- The existing elements of structure will maintain 60 minutes fire resistance as it is considered no less satisfactory than before the refurbishment works. Any new elements of structure will also achieve at least 60 minutes fire resistance given the topmost storey is less than 18m in height.
- The buildings will afford 15% perimeter access for firefighting purposes.
- The unprotected area consisting of non-fire rated openings (i.e. windows and doors) is not being altered and therefore no less satisfactory than the existing condition.
- As the basement is less than $200m^2$ in floor area and having a depth less than 3m then there is no requirement to provide smoke and heat ventilation. This is no different from the existing condition and therefore no less satisfactory.

The fire strategy for the proposed building complies with Approved Document B except for the following departures:

- To support the omission of alternative escape routes it is proposed to introduce an automatic openable vent (AOV) measuring $1m^2$ free area located at high level to assist with smoke escaping to atmosphere located on the Level 04. See Section 7.3 for more detail.
- The total single direction of escape from the balcony to the storey exit on all upper floor levels exceeds 18m by an additional 3m, totalling 21m. This is deemed acceptable given the additional 2.5s travel time is considered to be mitigated by an enhanced fire and smoke alarm. For more detail see Section 3.2.1.
- It is proposed to introduce a balcony to every upper floor level located at the rear of the building which is defined as an external wall attachment. This reduces the available boundary distance between buildings making the existing condition less satisfactory than before. Hence as part of a fire engineered solution a fire and smoke curtain is proposed acting as a shield to reduce the unprotected area. For more detail see Section 6.2.
- Access to the balcony is via a door opening which requires increasing the unprotected area in the façade. This creates a radiating heat issue between buildings and therefore as part of an engineered solution it is proposed to apply a 60 minute fire and smoke fire curtains to reduce the unprotected openings. See Section 5.2.2 for more detail.
- The ground floor will form part of a reception/welcoming lobby whilst also being the stair final exit. To maintain sufficient means of escape it is proposed to introduce fire and smoke curtains to form a protective route leading to the final exit. See Section 5.2.2 for more detail.

The above departures are subject to agreement with the Approving Authority.

2. Introduction

2.1 Overview

Marshall Fire has been appointed by Polestar Plc to provide fire safety advice to the project. Our role is therefore to advise on the design of the buildings against compliance with Part B of the Building Regulations and assist in steering the designs towards Building Regulation approval.

2.2 Purpose of this report

This report details how we consider the building will comply with the requirements of Part B of the Building Regulations. In doing so the guidance contained in Approved Document B has been used, with the main structure of the report following the main parts of Part B of the Building Regulations.

The approval status of the fire strategy should be considered as a risk until such time as the appointed Building Control Body has reviewed the proposals and provided their approval in principle. Once approved in principle the building should be constructed in accordance with the contents of this report and any amendments should be reviewed and approved accordingly by the Building Control Body.

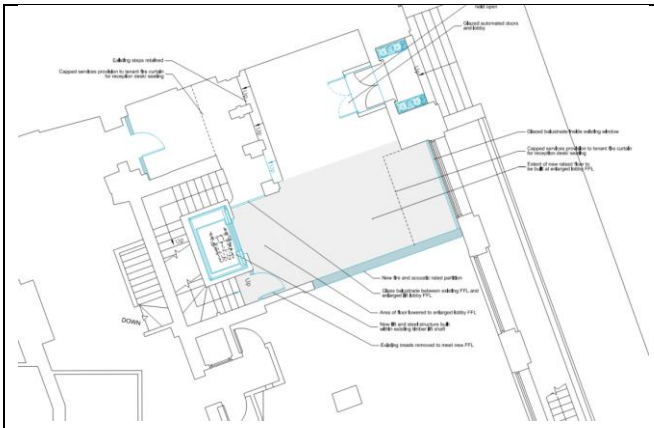
The findings of this report are based on the information available at the time of writing this report. We cannot be held responsible for any subsequent changes to the design that we are not made aware of.

2.3 Scheme description

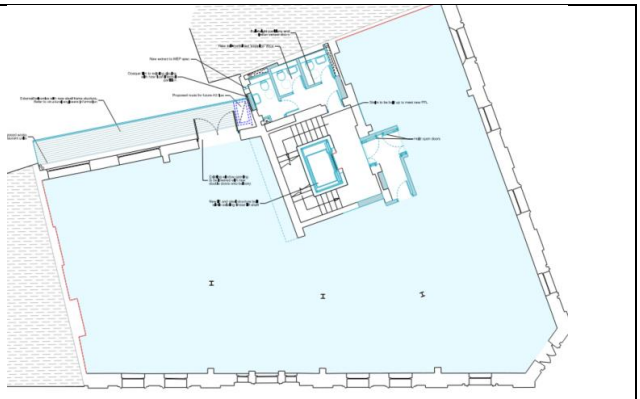
The proposed project consists of the refurbishment of an existing listed office building known as Project 3, Norfolk House. The building has a single stair serving all floor levels plus basement with lobby protection to all floor levels. The building has a topmost storey measuring 17m in height when measured from access level.

The existing use as office will continue but in the form of an open plan arrangement. No additional floor levels are being introduced.

The building consists of a basement, ground and four upper floor levels. It is considered that the current layouts will be no less satisfactory than the existing condition prior refurbishment works and the design team will look to introduce a stair AOV to overcome any shortfalls.



Ground floor plan



Typical upper floor plan

Basement

Section View

Figure 1: Norfolk House Floor Plans

2.3.1 Anticipated Occupancy Figures

Table 1: Anticipated Occupancy Figures

The maximum anticipated occupancy figures are noted below. For an office building a floor space factor of 6m^2/person has been used.

Project 3	***Norfolk House***	
Level	**Floor Area m^2**	**Anticipated Occupancy**
Basement	60	6 people
Ground	75	13 people
First	263	43 people
Second	263	43 people
Third	263	43 people
Fourth	267	45 people
TOTAL		**193 people**
Total upper floor occupancy		**174 people**

2.3.2 Purpose Group

Approved Document B reviews the type of building as purpose groups and in this instance will fall under Purpose Group 3 – Office.

2.4 Report limitations

This report is intended for use on this project only and the contents and approaches should not be applied to any other building. This report details how the building will be constructed and does not guarantee that the building has been constructed in accordance with this document. We cannot take any responsibility for any shortfalls in the standard of construction on site as this would lie with the installer.

The proposals within this report are strategic only and any works listed herein will need to be appropriately designed and installed by others. Where it is considered that the proposals within this report may present a risk under the Construction (Design and Management) Regulations 2015 (CDM) these will be highlighted to the Principal Designer.

This report focuses on Part B of the Building Regulations. Compliance under the other Parts of the Building Regulations will also need to be achieved through works undertaken by others.

The contents and findings herein are based on the information available at the time of publication and referred to within this document. The contents should be considered an approvals risk until formally approved by the appointed Building Control Body.

By complying with the recommendations in this report it will not ensure that fires will not occur, and ongoing management of the building is essential to ensure the fire risk is controlled as much as possible. This is controlled in part by the risk assessment required under the Regulatory Reform (Fire Safety) Order 2005. This legislation applies to the common areas in the building and requires that a fire risk assessment is undertaken and regularly reviewed (including whenever changes occur that might affect standards of fire safety within the building). The risk assessment will need to be made available to the Fire Service upon inspection of the building and any findings within the risk assessment are required to be addressed by the person responsible for fire safety within the building. If this is not undertaken the Fire Service have powers to serve notices on the building which could ultimately lead to it being shut down.

3. B1 - Means of Warning and Escape

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B1, Means of warning and escape:

"The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times."

3.1 Means of Warning and Evacuation Regime

It is proposed that the office building will operate under a simultaneous evacuation regime and therefore in the event of a fire that building will be evacuated independent of the adjacent buildings given the compartment line/party wall and independent escape routes.

It is not currently proposed to incorporate an investigation period given the nature of the building.

To enable an efficient evacuation of the building, the fire alarm system will be designed and installed in accordance with BS5839-1 to a minimum standard of Category L1. This will consist of smoke detection, manual call points and sounders. The system is to be designed and installed in accordance with BS5839-1 and will incorporate fire detection throughout the building. Areas with suitably low fire risk need not be protected, as follows:

- Toilets, shower rooms,
- Small cupboards less than 1m^2, and
- Some shallow voids (less than 800mm in depth) and concealed spaces.

In areas with noisy environments or where people might otherwise have difficulty in hearing the fire alarm, visual alarm devices (flashing warning beacons) should be used.

3.2 Horizontal Means of Escape

3.2.1 Travel Distance

The maximum recommended travel distances for an office building where the layout is known is 18m in a single direction and 45m where more than one direction of escape is available.

It should be noted that the above limits are actual travel distances where the layout is known. Where the internal layout is not known the maximum distances should be reduced to 2/3rds of those shown above. Therefore, the above limits should be borne in mind when the internal layout is being developed.

From inspection of the drawings, the current travel distances are satisfactory with the exception when taking the total single direction of escape from the balcony to the storey exit. The additional 3m (totalling 21m) is deemed acceptable on the following basis:

- It is unlikely that a person will be located within the most remote corner of the floor plate for long periods and therefore considered infrequent.
- The additional 3m at a typical walking speed of 1/2m/s equates to an additional 2.5s evacuation time (i.e 3m divided by 1.2m/s).
- The additional travel distance is not detrimental to the life safety of the occupants given the maximum anticipated occupancy on the worst floor level is 45 people with a limitation of 60 people for a single stair building where the occupants are awake and familiar with their surroundings.

The above departure carries an approval risk and is subject to agreement with the Approving Authority.

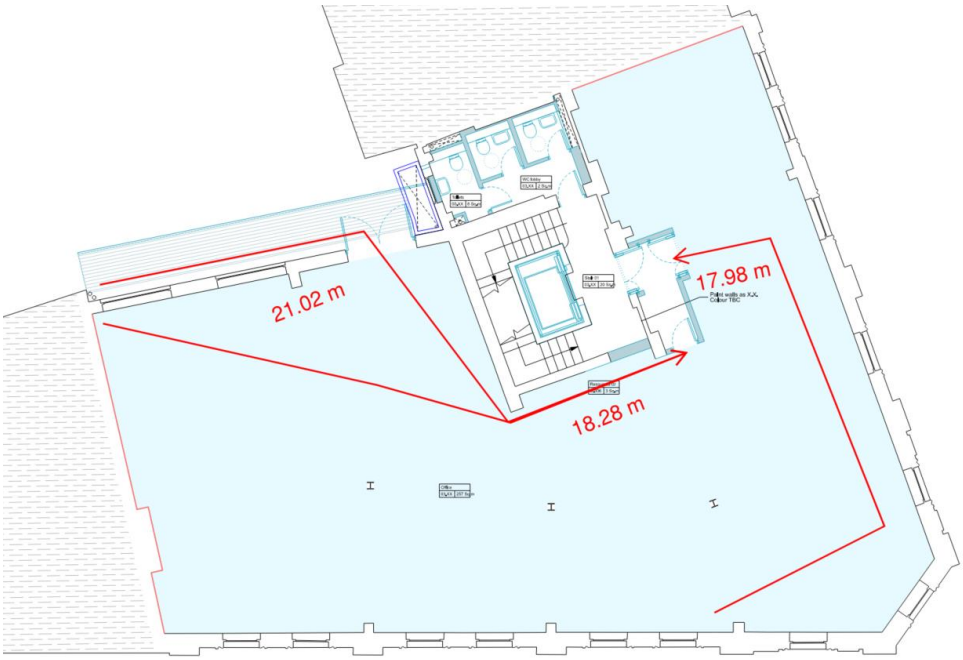


Figure 2: Travel distance Limitations

3.2.2 Horizontal Means of Escape

All doors would require a minimum clear width of 750mm to comply with Part B; whereby reduced mobility access is provided a door width of 850mm is required. From inspection of door widths, 750mm is achieved.

Doors that are to accommodate more than 60 people in an emergency must swing in the direction of escape. From inspection of the plans, the final exit doors do not open outward however the existing condition is deemed acceptable. This is no less satisfactory than the existing condition and therefore no change is proposed.

Any gradients on escape routes should be no steeper than 1:12.

Note: Doors should either not be fitted with a lock, or provided with fastenings that are easily negotiated in the event of a fire. Doors where it is expected will be used by more than 60people in the event of a fire should open in the direction of escape and any access controls on doors should be overridden in the event of a fire being detected.

3.3 Vertical Means of Escape

Norfolk House has a topmost storey measuring 17.0m above access level is served by a single stair having lobby protected on every floor level and therefore limited to 60 people with a minimum 750mm clear width door.

Given the topmost storey exceeds 11m in height it should be provided with alternative escape. This will not be provided as the building is existing and no major changes are proposed, with the limited space and listed nature it is not practically possible.

The following refurbishment work is considered reasonable on the following basis:

- The original building height is not being changed and therefore no greater risk.
- The proposed works are to remove internal partitions to create an open plan feel to the existing office floor plates.
- The removal of non-fire rated partitions is deemed no less satisfactory than the existing condition and therefore not detrimental to life safety.
- The occupancy for a typical floor plate is limited to 60 people but from inspection of the plans the highest anticipated occupancy on a single floor plate using $6m^2$/person is 45 people and therefore the building will have a low occupancy overall.
- The office buildings will be provided with a Category L1 fire and detection system, this is an enhancement over the minimum Category M required for Building Regulation approval.

- It is proposed to introduce an Automatic Openable Vent (AOV) to the fourth floor of the stair measuring 1m^2 free area to allow smoke to escape and as a compensatory feature.

The above justifications are deemed acceptable but subject to agreeing with the approving authority.

The vertical means of escape calculation has been carried out in a tabular format with the stair width, number of floors served and stair capacities.

Table 2: Stair Capacities

	Norfolk House
*Stair Width**	1000mm
Purpose Group	3 (Office)
	Floor Levels Served
4th floor	X
3rd floor	X
2nd floor	X
1st floor	X
Ground floor	X
Basement	X
Single Stair Buildings	Single Stair Buildings are limited to 60 people per floor level served
Allowable Capacity (People)	360 people
Total Anticipated Building Occupancy	**174 people**

Note: Table 3.1 of ADB allows for a minimum stair width of 800mm under Part B but should achieve 1000mm for Part M.

All escape routes are to remain sterile (i.e. free from fire load).

Basement

An escape stair forming part of the only escape route from an upper storey should not continue down to serve a basement storey unless the stair is enclosed at ground level to prevent smoke affecting the upper floor levels. From inspection of the plans, the stair has been provided with a door at ground floor level preventing smoke rising and affecting upper floor levels.

3.4 Merging flows

Where a storey exit shares the final exit, the width of the final exit should be sufficiently sized to account for the additional congestion.

Due to the low occupancy per floor level (less than 60 people) it is anticipated that no merging will likely occur. On this basis the merging flow is deemed acceptable and will not provide detrimental effects to the occupants.

3.5 Provision of Refuges

The building is provided with stepped access and therefore reduced mobility is limited. Where access is achieved then the occupant can only use the ground floor levels. This is deemed reasonable given the existing condition is no less satisfactory than before the refurbishment works.

No refuge locations will be provided on the lower or upper floor levels due to space constraints and no reduced mobility occupants will be able to reach these levels.

3.6 Emergency Lighting and Escape Signage

Emergency lighting should be provided in accordance with BS5266-1 and include coverage in the following areas:

Table 3: Emergency Lighting and Escape Signage

Building Type and Emergency Lighting and Escape Signage Requirements

Office	• Underground or windowless accommodation; • Stairs; • Internal corridors more than 30m long; • Open plan areas greater than 60m^2; • All sanitary accommodation with a floor area over 8m^2; • Windowless sanitary accommodation with a floor area less than 8m^2; • Electricity and generator rooms; • Switch room/battery rooms for emergency lighting systems; • Emergency control rooms (where provided). • Areas directly outside the final exits.

Every escape route should be adequately signed in accordance with BS5499-4.

4. B2 - Internal Fire Spread (Linings)

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B2, Internal Fire Spread (Linings):

> *(1) To inhibit the spread of fire within the building the internal linings shall-*
>
> *(a) Adequately resist the spread of flame over their surfaces; and*
>
> *(b) Have, if ignited, a rate of heat release which is reasonable in the circumstances.*
>
> *(2) In this paragraph 'internal linings' means the materials lining any partition, wall, ceiling or other internal structure.*

Internal linings are required to be provided in accordance with Table 4 in Approved Document B as follows:

Table 4: Classification of Linings

Location	*Classification*
Small rooms of maximum internal floor area of $4m^2$	D-s3, d2
Other rooms (including garages)	C-s3, d2
Other circulation spaces	B-s3, d2(1)

NOTE:

1. *Wallcoverings which conform to BS EN 15102, achieving at least Class C-s3, d2 and bonded to a Class A2-s3, d2 substrate, will also be acceptable.*

5. B3 - Internal Fire Spread (Structure)

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B3, Internal Fire Spread (Structure):

(1) The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period.
(2) A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those two buildings.
(3) To inhibit the spread of fire within the building, it shall be sub-divided with fire resisting construction to an extent appropriate to the size and intended use of the building.
(4) The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.

5.1 Loadbearing Elements of Structure

The elements of structure for Norfolk House having a topmost storey less than 18m in height are required to achieve no less than 60 minutes fire resistance in accordance with ADB.

The existing loadbearing elements of structure will remain as it is considered no less satisfactory than before however any new piece of structure defined as loadbearing will be required to meet 60 minutes fire resistance.

Where one element of structure supports or stabilises a loadbearing element of structure, the supporting element should not have a lesser fire resistance than the loadbearing element.

Existing walls that are required to be fire rated should be reviewed on site and any obvious damage (such as large cracks etc) should undergo remediation during the site works to ensure building integrity.

Any elements which only support themselves, provided for wind loading and/or a roof can be non-fire rated.

5.2 Compartmentation

5.2.1 Size of Compartments

An office has no limit on the size of compartments and therefore there is no requirement to subdivide the building into further compartments.

5.2.2 Compartmentalisation

The Norfolk House Building shares a party wall and therefore will need a separation line, this is achieved by having an existing compartment line. This would typically be rated to 60 minutes fire resistance as per the elements of structure. Where existing walls are used it is assumed that where they are of masonry construction they will achieve 60 minutes fire resistance.

The office building measures less than 30m in height and has no sleeping risk, therefore having no compartment floors required on the upper floor levels. The basement and ground floor should be a compartment floor achieving 60 minute fire resistance. We would recommend that the floor is inspected and any obvious remedial works necessary be undertaken.

The stair enclosure will require 60 minutes fire resistance due to breaching the ground floor compartment floor. As the lift shaft is positioned within the stair enclosure it is not proposed to fire rate the shaft on the basis the outer walls are suitably fire resistant.

Any penetrating shafts/service riser which passes through the compartment floor at ground and constructed as a continuous vertical protected shaft shall afford a fire resistance equal to the elements of structure (i.e 60 minutes fire resistance). No smoke seals or self-closers are needed however the riser doors should be kept locked shut and labelled kept locked shut.

The kitchenette is a tea point with a microwave and therefore considered low risk. No commercial/large scale cooking will take place. No fire resisting enclosure required.

Where the basement lockers are within the stair then this is deemed a fire risk and therefore a 30 minute fire rating is required to prevent fire spread. Alternatively add a door to enclose the stair and form a basement lobby.

The ground floor will also form part of a reception/welcoming lobby whilst also being the stair final exit. It is highly important to kept the escape route sterile and therefore by introducing a seating area and a desk to the ground floor lobby the stair has become a potential risk. To mitigate the risk and maintain sufficient means of

escape it is proposed to introduce fire and smoke curtains to form a protective route leading to the final exit. The fire and smoke curtain will achieve 60 minutes fire resistance, be installed in accordance with BS8524 Part 1 and Part 2 and maintain a 2m head height for 120 seconds before deploying full height. This is to ensure the reception area evacuate without being trapped behind the fire curtain. A retractable switch will be provided to allow ascent/descent of the fire and smoke curtain.

The introduction of a balcony to the upper floor levels is a new feature and therefore required to be assessed. Given the balcony reduced the separation distance between buildings but also the access is via a door opening which is achieved by increasing the unprotected area in the façade. This creates a radiating heat issue between buildings and therefore as part of an engineered solution it is proposed to apply 60 minute fire and smoke fire curtains which will act like a shield to reduce the unprotected area. The new door opening will no longer be subjected to fire spread concerns and therefore deemed acceptable.

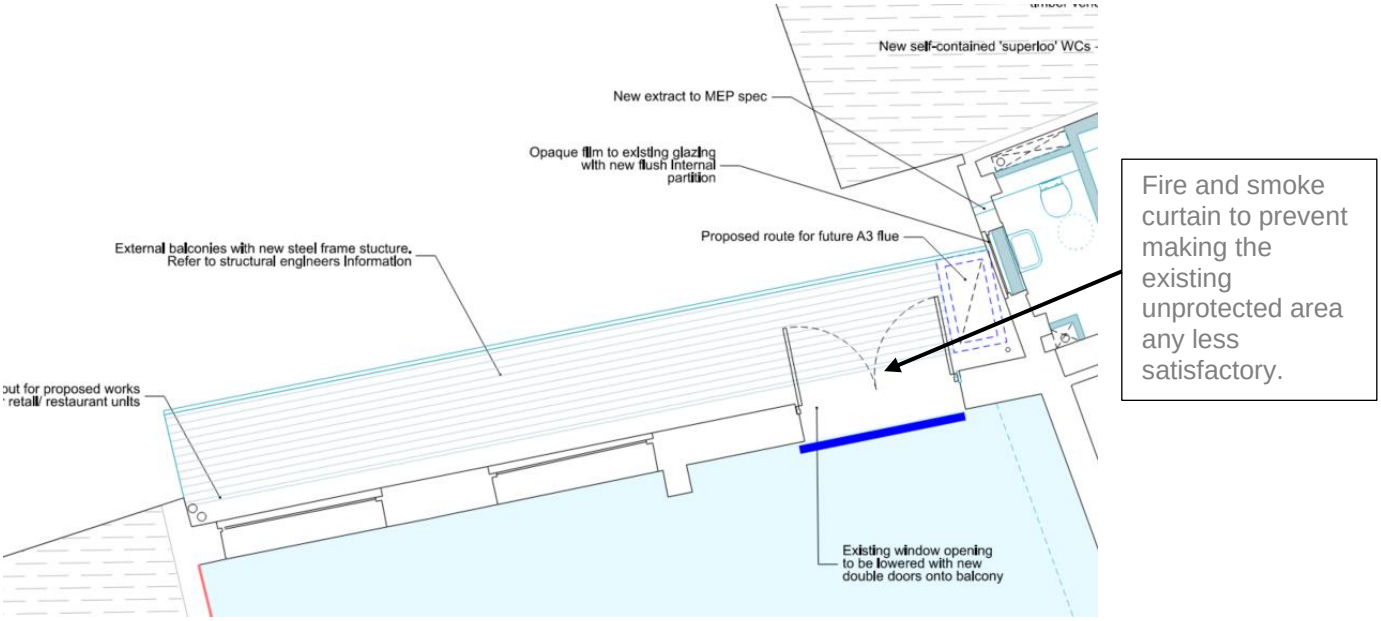


Figure 3: Fire and smoke curtain to external wall.

Table 5: Compartmentation (fire-resistance) requirements

Part of building	*Fire resistance rating (mins)*	*Fire doors*
Means of escape stair	60 (each side separately)	FD30S
Protected stair lobbies	30 (each side separately)	FD30
Service risers	60 (each side separately)	FD30
Substation	120 (each side separately)*	FD60*
Places of special fire hazard	30 (each side separately)	FD30
Store rooms	30 (each side separately)	FD30
Separating Buildings	60 (each side separately)	-
Fire and Smoke Curtains	60 (each side separately)	-

Note: *Please be aware that specific electrical supplies may require additional fire resistance to any substation on site.

5.3 Sprinkler Protection

There is no requirement to provide a sprinkler system in accordance with BS EN 12845 due to the building being under 30m in height.

5.4 Provisions for Cavities

The unseen spread of fire and smoke will be controlled by the provision of cavity barriers. These will be rated to 30 minutes integrity and 15 minutes insulation and be provided such that the maximum dimension of any cavity will be limited in size to 20m in any direction. This is on the assumption that the linings achieve the fire performance listed in Table 9.1 of Approved Document B. This is reproduced below for reference.

Table 9.1 Maximum dimensions of cavities in buildings other than dwellings (purpose groups 2 to 7)

Location of cavity	Class of surface/product exposed in cavity (excluding the surface of any pipe, cable or conduit, or any insulation to any pipe)	Maximum dimension in any direction (m)
Between roof and a ceiling	Any	20
Any other cavity	Class C-s3, d2 or better	20
	Worse than Class C-s3, d2	10

Figure 4: Maximum dimensions of cavities

Cavity barriers will also be required to be provided in the following locations:

- Around openings;
- Top of cavity wall;
- Within external cavity walls along the lines of internal fire rated walls;
- Concealed spaces greater than 20m in length.

This is detailed in Diagram 9.1 of Approved Document as reproduced below.

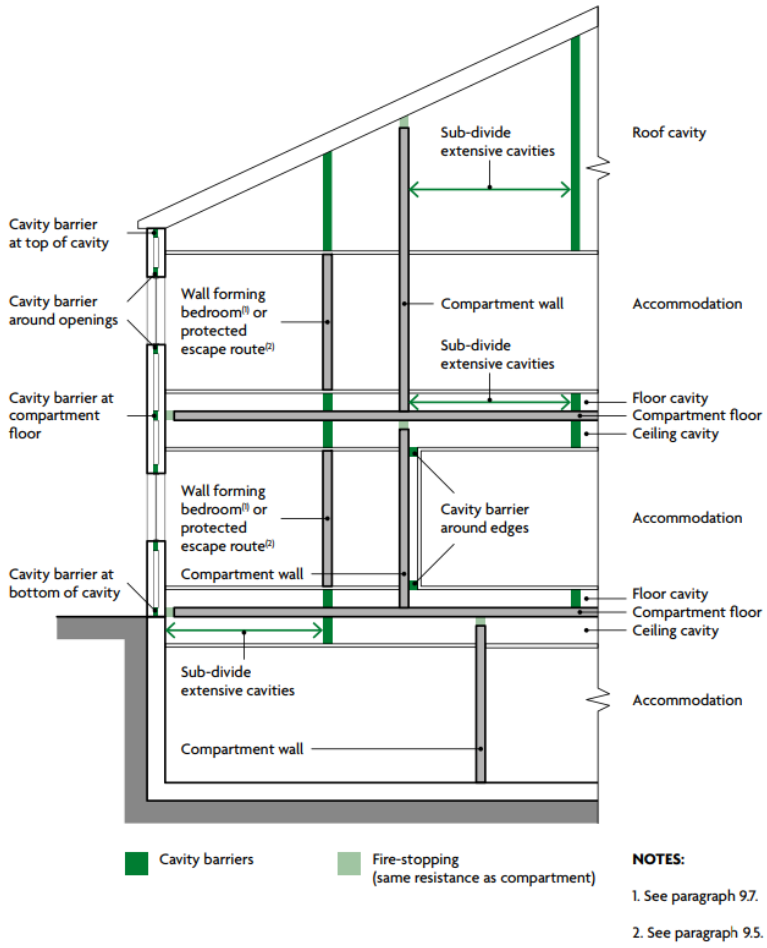


Figure 5: Provision of Cavity Barriers

6. B4 - External Fire Spread

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B4, External Fire Spread:

> *(1) The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of building.*
>
> *(2) The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.*

6.1 Overview

Buildings are required to be assessed for external fire spread however the proposed works are to be undertaken on an existing building. Given the external walls of the units will not be altered or changed, then they are considered no less satisfactory.

6.2 Space Separation

It is proposed to introduce a balcony to every upper floor level located at the rear of the building which is defined as an external wall attachment. This reduces the available boundary distance between buildings making the existing condition less satisfactory than before and therefore needs to be considered. The balcony is to be constructed from non-combustible materials and not used for storage therefore not a medium for fire spread, therefore the balcony is low risk.

The existing window will need to be converted into an access door and therefore increasing the unprotected area. It is proposed to introduce a fire and smoke curtain to enclose this opening and therefore making the proposed condition no less satisfactory than prior the refurbishment.

Refer to Section 5.2.2 for more details on the fire and smoke curtain.

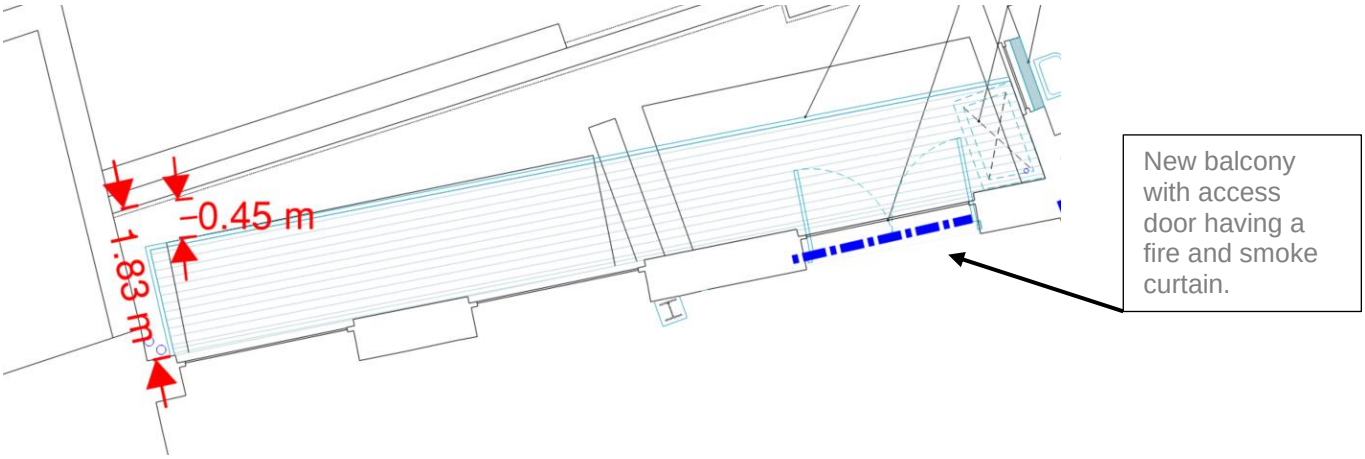


Figure 6: Attaching balconies to the external wall

6.3 Surface Spread of Flame Requirements

It is not proposed to change the external façade surface and therefore the existing condition is deemed acceptable.

Where the client wishes to improve or change the external wall, the surface spread of flame is required to achieve not provision up to 18m in height given a boundary greater than 1000mm and Class B-s3, d2 or better where the boundary distance is less than 1000mm.

6.4 Combustibility of Insulation and other Components in the External Walls

It is not proposed to change the external façade build up and therefore the existing provision is deemed acceptable.

It is noted that the office buildings are not part of a “Relevant Building” group, defined as over 18m in height or contains;

- One or more dwellings,

- An institution,
- A room for residential purposes such as student accommodation, sheltered housing, hospitals and boarding schools excluding hotels, hostels and boarding houses.

Then Regulation 7(2) does not apply; therefore, no limitation on insulation products.

7. B5 - Access and Facilities for the Fire Service

Schedule 1 of the Building Regulations provides the following functional requirement in relation to B5, Access and Facilities for the Fire Service:

> *(1) The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life.*
>
> *(2) Reasonable provisions shall be made within the site of the building to enable fire appliances to gain access to the building.*

7.1 Access to the Building for Firefighting

Fire service will access the building via the same public roadways as prior to the refurbishment works. The following parameters are considered to be achieved and no less satisfactory than before give no changes to the landscaping are proposed.

Table 6: Pump appliance access route requirements

Appliance Type	*Min. width of road between kerbs (m)*	*Min. width of gateways(m)*	*Min. turning circle between kerbs(m)*	*Min. turning circle between walls (m)*	*Min. clearance height (m)*	*Min. carrying capacity (tons)*
Pump	3.7	3.1	16.8	19.2	3.7	12.5*
High Reach	3.7	3.1	26.0	29.0	4.0	17.0*

Note: * The minimum carrying capacity should be checked with the local fire brigade.

As the topmost storey is less than 18m in height then there is no requirement for a firefighting shaft.

The existing firefighting provisions will not be changed and therefore is considered no less satisfactory than before the refurbishment works. Given the building exceeds 11m in height to the top occupied floor level it is required to achieve 15% perimeter access. The existing fire service access routes will be utilised and therefore this is considered acceptable.

Any gates that the fire and rescue service vehicle must pass are required to be provided with a fire brigade lock only (no other padlocks or locking devices are permitted).

7.2 Provision of Fire Hydrants

On the basis that the existing building provisions are no less satisfactory with no changes it is deemed acceptable.

7.3 Ventilation

Above ground

The existing building is deemed no less satisfactory after the refurbishment whilst acknowledging the building constraints. It is this reason that it is proposed that the stair whilst below 18m in height is provided with ventilation as part of a building enhancement and to support the shortfall in alternative escape by providing a 1m^2 free area automatic openable vent at high level.

An existing opening is positioned on Level 04 with an existing door being maintained within the stair preventing free flow to Level 5 that leads to the roof for maintenance only. This portion of stair is not accessible for everyday use and therefore Level 04 is the head of the stair.

Before Level 4 is adopted as the “head of the stair”, the design team should consider adding a power open device to the existing door leading to Level 5 so that the AOV can be open to atmosphere at the top of the building. The design team are to review this possibility and get agreement with the approving authority.

Overall, the smoke control provision is deemed a building enhancement to the existing condition.

Ancillary Areas

A protected lobby should be provided between an escape stair and a place of special fire hazard to protect from the ingress of smoke. The lobby should have a minimum 0.4m^2 of permanent ventilation, or be protected by a mechanical smoke control system.

No high risk areas are provided adjacent the stair as the toilets are deemed low risk.

Basement Smoke Control
As the basement measures less than 200m^2 in floor area and having a depth less than 3m then there is no requirement to provide a smoke and heat ventilation system. The existing provisions are deemed no less satisfactory than before the refurbishments.

7.4 Emergency Power Supplies

In the event of a failure of the mains power supply a secondary backup power supply will be provided to feed all life safety systems that require electricity to function as intended. The secondary supply will be appropriate for the life safety system concerned. The following life safety systems will include a backup power supply:

- Emergency lighting.
- Automatic fire alarm and detection systems;
- All fire alarm interlinked fire/smoke dampers (where present);
- Fire and smoke curtains.

It should be ensured that all power and control cabling required for life safety equipment within the building is specified and installed in accordance with BS8519.

8. References

i. Approved Document B – 2019 with 2020 amendments, Volume 2: Buildings other than dwelling houses.

ii. BS 5839-1:2017, Fire detection and fire alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance.

iii. BS 5266-1:2016, Emergency lighting. Code of practice for the emergency lighting of premises.

iv. BS EN 1838:2013, Lighting applications. Emergency lighting.

v. BS 5499-4:2013, Code of practice for escape route signing.

vi. BS ISO 3864-1:2011, Graphical symbols. Safety colours and safety signs. Design principles for safety signs and safety markings.

vii. BS 9990:2015, Non automatic fire-fighting systems in buildings. Code of practice.

viii. BS 476 series: 1987, Fire tests on building materials.

ix. BS EN 1366-3:2009, Fire resistance tests for service installations. Penetration seals.

x. BS 8519:2020, Selection and installation of fire-resistance power and control cable systems for life safety and fire-fighting applications. Code of practice.

xi. BR 187: 2014 External Fire Spread Building Separation and Boundary Distances.

xii. BS 8524-1: 2013 Part 1 and Part 2 Active fire curtain barrier assemblies – Specification