# Alfred Gunn House

## Retrospective Fire Safety Strategy

19/08/2025

Sandwell Metropolitan Borough Council

RFSS-00436-00522-01

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## Contents

# 1. Introduction

## 1.1 Report Purpose and Intent

RPS has been commissioned by Sandwell Metropolitan Borough Council (SMBC) to produce a Retrospective Fire Safety Strategy (RFSS) for an existing 1960's residential tower block: Alfred Gunn House, Oldbury, Birmingham, B68 8QR. The Alfred Gunn site is owned and operated under the jurisdiction of Sandwell Metropolitan Borough Council (SMBC).

Refurbishment works have been carried out within both the common areas and residential units, and an additional accommodation floor has been added. The full details of these works are described in Section 3.

As all works commenced prior to the enactment of the Building Safety Act 2022 (BSA) [25] there is no requirement to utilise the building gateway processes for planning, design or build stages. Nonetheless, Alfred Gunn House is classified as a 'high risk' building under the BSA, and as such will need to be registered with the Building Regulator under the requirements of the Act and will ultimately require a Building Safety Case to justify the fire safety measures in place for the building.

The refurbishment works have been carried out under the Building Regulations 2010. This requires that new works comply with the B1 – B5 performance standards for fire and that material alterations are acceptable where the alteration does not create a situation which would be worse than the existing condition. However, in order to provide assurance that the building will achieve a standard of fire safety that will ultimately be accounted for in the BSA, by means of a building safety case, it is recognised that works may be required to raise the standard of the existing arrangements.

It is also a requirement that once the works are carried out for the common parts of the building that they will be found acceptable when considered during the ongoing fire risk assessment process that is a requirement under the Regulatory Reform (Fire Safety) Order 2005 (FSO) [1].

## 1.2 Scope

The scope of this assessment is limited to Alfred Gunn House, Cores C, A and B.

The primary aim of this report is to ascertain the standard of existing fire safety provisions, after the recent refurbishment of the building. This has subsequently allowed RPS to provide recommendations with regard to the current fire safety provisions to ensure a reasonable standard of fire safety is provided in the existing buildings. This report summarises the findings of a desktop study which reviewed the relevant documentation, certification and plans, and and also the information noted during a site inspection and provides recommendations where improvement works are considered necessary to achieve an acceptable standard of fire safety

The Alfred Gunn building (AG) is subject to Regulation 3 of The Building Regulations 2010 [2]; specifically the material alteration of a building, due to additional flats being added, or a controlled service or fitting. The completed works will also be subject to a formal review by the Local Building Control Authority and subject to approval. There is a requirement for the Alfred Gunn building works to comply with the applicable requirements of the Building Regulations. Noting that the building work must be no more unsatisfactory in relation to the requirements than before the work was carried out.

This report will also form the basis of the Building Safety Case; identifying the fire safety provisions that are in place, risk mitigation measures, fire risk assessment and fire safety management requirements.

The AG building has been benchmarked against Approved Document B (ADB) Volume 1: Dwellings 2020 Edition to satisfy the Functional Requirements of Part B of Schedule 1 of the Building Regulations 2010. However, ADB is not always appropriate for prescriptive application to existing buildings but as will be noted in following sections, it can be used as a benchmark for comparative purposes. The limitations imposed by the existing building will need to be considered within the fire strategy. Therefore, the use of supporting documents such as, the Local Government Association (LGA) Guide 'Fire Safety in purpose-built blocks of flats' May 2012 which provides guidance with regards to the standard of fire safety considered appropriate for existing blocks of flats will also be utilised within the strategy.

PAS 911 [5] the British Standard framework and guidance for completing fire strategies has also been considered. Other relevant standards, such as BS 7974: Application of fire safety engineering principles to the design of buildings 2019 [] are utilised and referenced within this report. At the time of construction it is understood that the guidance for fire safety in blocks of flats was provided by British Standard Code of Practice CP3 Chapter IV Part 1; Precautions against fire. A historical perspective of the building guidelines applicable to Alfred Gunn will be provided where appropriate within this report.

It should be noted that a "pick 'n' mix" approach has not been used. The principal guidance applied is ADB and other guidance has been referenced where necessary to support the fire engineered approach in order to evidence an equal level of safety, to a code compliant situation.

This report describes the recommendations for fire safety on the basis of following published fire safety guidance and fire engineering principles.

Table 1 below provides an overview of the main features of the building.

*Table 1: Main fire safety features*

| Requirement | Provision | Reference |
|---|---|---|
| Guidance Used | Approved Document B Volume 1: Dwellings, 2019 edition incorporating 2020 and 2022 amendments.<br>Approved Document B Volume 2: Buildings other than dwellings, 2019 edition incorporating 2020 and 2022 amendments. | Section 2 |
| Building Description and Purpose Group | Residential building with two basement levels that are to contain ancillary accommodation and 10 floors of residential accommodation above ground.<br>Purpose group Residential (Dwellings) - 1(a) | Section 3.2 |
| Building Height | Top storey height of 26m. | Section 3.2 |
| Evacuation Strategy | Stay put evacuation strategy within the residential apartment areas.<br>Simultaneous evacuation within the ancillary areas | Section 4 |
| Automatic Fire Detection and Alarm System | Residential areas will be provided with Category LD1 Grade D1 automatic fire detection and alarm systems in line with BS 5839-6:2019+A1:2020.<br>Ancillary areas will be provided with Category L1 automatic fire detection and alarm systems in line with BS 5839-1:2017.<br>Category L5 automatic fire detection and alarm systems in line with BS 5839-1:2017 should be provided within the stair and associated lobbies to operate the associated smoke control systems, where applicable. | Section 5 |
| Automatic Fire Suppression | Sprinkler system in accordance with BS 9251:2021 provided throughout the building | Section 7 |

| Requirement | Provision | Reference |
|---|---|---|
| Structural Fire Resistance | 60 minutes – on the basis that a BS 9251 sprinkler system has been installed throughout residential accommodation and any other ancillary areas containing a fire load. | Section 10 |
| External Wall Construction | This is outside the scope of this report and is considered in Reference | Section 11.1 |
| Roof Covering | $B_{ROOF}(t4)$ | Section 11.3 |
| Firefighting Access | Firefighting access to the building will be provided via the central protected stair the building. Nearby lift access will be used as a 'Fireman's lift with override controls for fire service use. There are two dry risers with outlets provided at each floor level accessible from the protected stair. | Section 12 |

## 1.3 Deviations from Guidance

Where recommendations in guidance cannot be met in full, or an alternative design is required to meet the architectural aspirations and client requirements, fire-engineering principles have been adopted. The alternate approaches to meet the Functional Requirements of Part B of Schedule 1 of the Building Regulations 2010 are summarised in where relevant in this report.

*Table 2: Summary of Deviations from Published Guidance and Proposed Solutions*

| Deviation from Guidance | Discussion | Reference |
|---|---|---|
| 11th floor hose laying distance from riser outlet | The hose laying distance to the extremities of the 11th floor is excessive, however this is thought reasonable based on the low fire load and high category fire detection. | Section 12.3 |

## 2. Relevant Guidance

This report outlines the proposed fire safety strategy for Alfred Gunn House. The purpose of this report is to set out and detail the fire safety principles that will be present upon completion of the building.

The building and safety measures described in this fire strategy will need to satisfy the relevant provisions of the following fire-related legislation:

- The Building Regulations 2010 as amended 2018 and 2022
- Regulatory Reform (Fire Safety) Order 2005
- The Fire Safety (England) Regulations 2022
- Building Safety Act 2022
- Statutory Consultation
- Regulation 38

### 2.1 Building Regulation 2010

The Building Regulations, produced under the Building Act 1984, is the primary legislation controlling building work and applies to the majority of new or materially altered buildings.

Part B of Schedule 1 to the Building Regulations includes five functional requirements.

- Regulation B1 Means of Warning and Escape
- Regulation B2 Internal Fire Spread (Linings)
- Regulation B3 Internal Fire Spread (Structure)
- Regulation B4 External Fire Spread
- Regulation B5 Access and Facilities for the Fire Service

This fire strategy, along with plans issued by the Architect and other relevant documents, is intended to demonstrate full compliance with the above regulations for the refurbishment works carried out.

### 2.2 Regulatory Reform (Fire) Order

The Fire Safety Order is the primary piece of legislation relating to fire safety in occupied, non-domestic premises (including the common areas of apartment blocks) and is usually enforced by the local fire authority.

The duty of ensuring that the requirements of the Order are met rests with the Responsible Person, who must undertake a risk assessment for the purpose of identifying the fire precautions he needs to take.

### 2.3 Fire Safety Regulations 2022

The Fire Safety (England) Regulations 2022 are the recent regulations that came into force on 23 January 2023. The regulations describe the responsibilities of the Responsible Person, as defined under the Regulatory Reform (Fire Safety) Order in relation to fire safety within the buildings that contain two or more domestic premises (including the residential parts of mixed-use buildings).

The extent of the responsibilities defined within the regulations varies depending on the height of the building and whether it is classified as a "high-rise residential building", as defined within Regulation 3 of the Fire Safety (England) Regulations 2022.

For Alfred Gunn House, the full extent of the regulations would apply as it is defined as a "high-rise residential building" due to the top occupied floor of the building being more than 18 m above the lowest adjacent ground level. Relevant provisions under the act include:

- Provide residents with fire safety instructions, including how to report a fire, the evacuation plan and so on.
- Provision of a Secure Information Box (see Section 12.6).
- Provide way-finding signage (see Section 12.5)
- Have a robust system for fault reporting and maintenance – with particular stress on fire doors (including flat entrance doors) and firefighting equipment.
- Provide the fire service with information regarding the external wall construction as well as floor and building plans.

### 2.4 Building Safety Act 2022

The Building Safety Act 2022 is a comprehensive UK legislation enacted to enhance building safety, particularly in high-rise residential buildings following the Grenfell Tower tragedy. It establishes a new regulatory framework, including the creation of the Building Safety Regulator within the Health and Safety Executive.

The Act mandates the appointment of Building Safety Managers and Accountable Persons responsible for managing safety risks, introduces the concept of a "golden thread" of safety information, and enhances resident engagement in safety matters. It also sets new competence requirements for industry professionals and provides protections for leaseholders from unfair remediation costs related to building safety defects.

The Act aims to prevent future tragedies by ensuring rigorous safety standards and oversight throughout the lifecycle of high-rise buildings.

Whilst the staged gateway process doesn't apply to Alfred Gunn House it remains the case that residential premises over 18m will need to be registered with the Building Safety Regulator set up under the act and all such premises will require a building safety case. This retrospective fire strategy will underpin the safety case.

### 2.5 Statutory Consultation

During the Building Regulations application process, the building control body is required to formally consult with the local fire authority. The purpose of this consultation is to give the fire authority the opportunity to make observations with respect to the Building Regulations and to provide an opportunity to make the applicant aware of the action that may have to be taken to meet the requirements of the Fire Safety Order.

The consultation should allow both parties to reach mutually compatible views on whether the building meets the requirements of both pieces of legislation. In the exceptional event that the fire authority requires physical changes to be made to the building to meet the requirements of the Fire Safety Order, the building control body should make the applicant aware.

### 2.6 Fire Risk Assessment

There is now a requirement for a fire risk assessment to be undertaken for virtually all non-domestic premises. In many instances, the significant findings of this assessment are to be recorded. Furthermore, the onus on proving what reasonable fire safety measures should be provided lies with the person responsible for the building, not the enforcing authority.

According to PAS 79 - Fire Risk Assessment - Guidance and a Recommended Methodology - the risk assessment can only validly be carried out when a building is in normal use. However, it should be noted that there is no grace period between occupation and completion of the risk assessment, and thus failure to undertake a risk assessment prior to occupation could constitute a breach of legislation. OAL are therefore of the opinion that a pre-occupation risk assessment is essential to assist the responsible person in fulfilling their legal obligations.

The Building Regulations do not specifically require a risk assessment to be undertaken. However, the development of a fire strategy has risk assessment at its core, thereby ensuring that the measures provided in the building reflect the risk presented by those buildings' intended use.

### 2.7 Regulation 7 – Materials and Workmanship

Regulation 7 of the Building Regulations requires that all building work should be carried out in a workmanlike manner, with adequate and proper materials that are appropriate for the circumstances in which they are used, are adequately mixed and prepared, and are applied, used or fixed so as to perform the functions for which they are designed. Further guidance is provided in the Approved Document B supporting Regulation 7.

Independent certification schemes exist to provide additional confidence that products are manufactured and installed to an appropriate and consistent standard. It is therefore suggested that, where appropriate, manufacturers and installers that are subject to independent certification schemes are specified on this scheme.

### 2.8 Regulation 38

Regulation 38 of the Building Regulations requires fire safety information for a new or altered building to be passed to the responsible person at the completion of the project or on occupation, whichever comes sooner.

This requirement aims to provide the responsible person with appropriate information to assist him to operate and maintain the building in reasonable safety.

This information can therefore assist the responsible person in undertaking a risk assessment to meet the requirements of the Fire Safety Order.

As the developer of the fire strategy, OAL is well-placed to produce the information to meet these requirements. This will ensure a smooth transition between the design stage and the safe occupation of the completed building.

# 3. Project Description

## 3.1 Referenced Information

The table below provides a summary of the information that has been considered to develop the fire strategy. Where the design of the building is referred to in this report, it is based on the documents listed in the table below only.

*Table 3: Referenced Information*

| Description | Reference | Revision | Date |
|---|---|---|---|
| Setting Out - Level -01 Plan | WCH-SVA-ZZ-ZZ-DR-A-4010 | - | July 2023 |
| Setting Out - Level 00 Plan | WCH-SVA-ZZ-ZZ-DR-A-4011 | - | July 2023 |
| Setting Out - Level 01 Plan | WCH-SVA-ZZ-ZZ-DR-A-4012 | - | July 2023 |
| Stair Detail | WCH-SVA-ZZ-ZZ-DR-A-6050 | - | Nov 2023 |
| Proposed Site and Location Plan | WCH-SVA-ZZ-ZZ-DR-A-3001 | - | Mar 2023 |
| Setting Out - Level -02 Plan | WCH-SVA-ZZ-ZZ-DR-A-4010 | - | Dec 2023 |
| Setting Out - Level -01 Plan | WCH-SVA-ZZ-ZZ-DR-A-4011 | - | July 2023 |
| Setting Out - Level 00 Plan | WCH-SVA-ZZ-ZZ-DR-A-4012 | - | July 2023 |
| Setting Out - Level 01 Plan | WCH-SVA-ZZ-ZZ-DR-A-4013 | - | July 2023 |
| GA Elevations 01 | WCH-SVA-ZZ-ZZ-DR-A-4100 | - | Sept 2023 |
| GA Elevations 02 | WCH-SVA-ZZ-ZZ-DR-A-4101 | - | Sept 2023 |
| GA Elevations 03 | WCH-SVA-ZZ-ZZ-DR-A-4102 | - | Sept 2023 |
| GA Sections 01 | WCH-SVA-ZZ-ZZ-DR-A-4200 | - | Dec 2023 |
| GA Sections 02 | WCH-SVA-ZZ-ZZ-DR-A-4201 | - | Dec 2023 |
| GA Sections 03 | WCH-SVA-ZZ-ZZ-DR-A-4202 | - | Dec 2023 |

## 3.2 Building Description

The building comprises accommodation in flats (Purpose group 1(a)) with a ground floor (lower ground) and ten floors above. The lower ground floor will be an empty space containing only some building services and be accessibly only for occasional maintenance and repair. The building work consisted of the addition of a central staircase and tenth floor to recover accommodation lost to the additional stair.

The top floor is more than c. 18m in height from ground level access at nominally 26m. The site is sloping such that the lower ground floor exits to ground to the north elevation at which point the nominal height to the top floor is 29m.

The building is therefore classed as a relevant building, since it has a habitable floor at least 18m above ground and contains one or more dwellings.

The building is comprised of three linked cores as detailed in Figure 1 below. All accommodation floors from ground to 9$^{th}$ floor have the same layout, as shown in The 10$^{th}$ floor differs in that there is a plant room. The lower ground floor layout has been altered as part of the refurbishment to accommodate the sprinkler tanks and new main electrical supplies. However, there have been alterations in the design intent since the production of fire strategy drawings listed in Table 3.

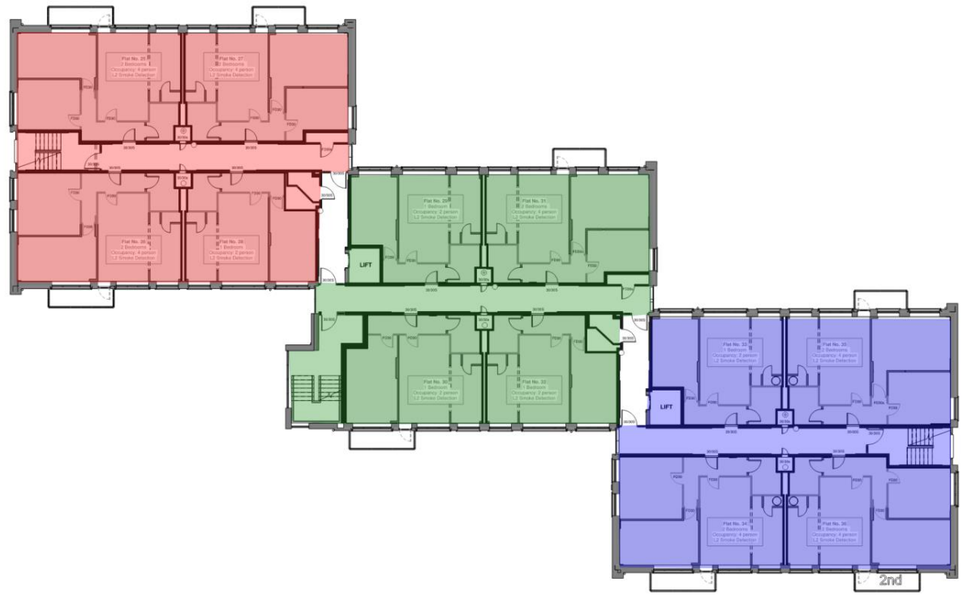



*Figure 1: Building Cores*

Each core within the block is provided with a protected central corridor to access the flat entrance doors with a staircase located in each section. The building also contains two sets of lifts, one located in the protected corridors of core A and B. Each floor contains twelve flats, four in each core, except the top floor which contains only 10 flats. There is a total of 130 flats in the building, these all providing either one- or two-bedroom accommodation.

The staircase in core A, referred to as staircase A, is the recently added staircase, that was introduced to improve evacuation routes from core A. Refuse chutes are located in a riser room in the protected corridor within cores C & A, the refuse chutes discharge into the bin stores located at lower ground floor.

The AG building has a lower ground floor. As this is accessed from ground level it does not fall under the definition of a basement area, and as such it provides no additional firefighting challenges in that regard. The lower ground is landlord occupancy only and has undergone significant alterations as part of the refurbishment, with the entire area now relatively fire sterile except for the main electrical riser and new unprotected cable runs. The sprinkler tank and pumps are also housed in this area. A fire strategy or layout drawing is not currently available; therefore, the following Recommendation is raised.

**Recommendation 1: Ensure a fire strategy drawing for the lower ground, showing the location of smoke detection, evacuation routes, sprinkler tanks, emergency lighting etc. is available.**

The refurbishment has also consisted of the addition of a tenth floor for which the layout can be seen in Figure 2. This has also resulted in the extension of staircases and the lifts up one level. Additionally, the tenth floor contains a plant room in the central area of the flats. A mezzanine floor in the plant room gives access to the 11$^{th}$ floor above which is required for maintenance purposes only. The mezzanine floor contains two corridors which are assessed to see if the travel distance is safe for means of escape from the plant areas.

*Figure 2: 10th Floor Layout*

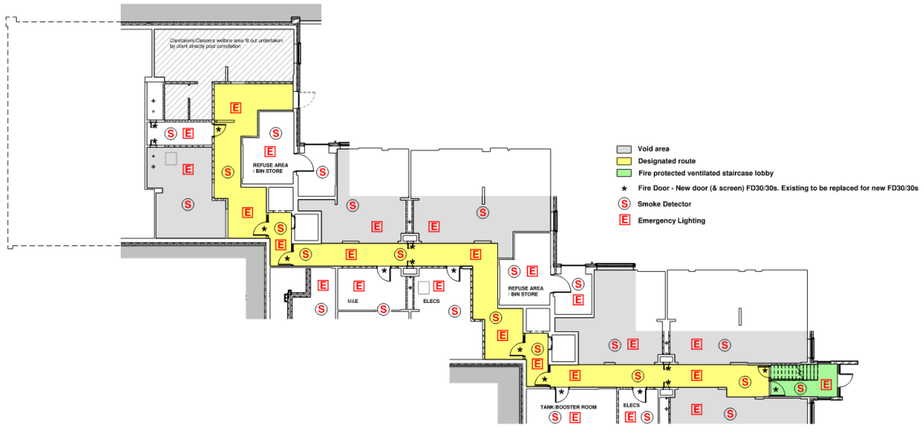



*Figure 3: Lower Ground*

# 4. Evacuation Strategy

## 4.1 Flats

A 'Stay-Put' strategy will be adopted for the building. The principle of such a strategy is that only the occupants of the apartment containing the fire (the 'flat of origin') are expected to make an escape. This approach is supported by national guidance for the Building Regulations, A fire will generally only occur in a flat,

- There is no reliance on external rescue,
- There is a high degree of compartmentation and therefore a low probability exists that there will be fire spread beyond the flat of origin,
- If a fire does occur within the common parts, the materials and construction used in these areas should limit the development and spread of fire.

Whilst there have in recent years been a number of serious fires affecting high risk residential buildings in which there has been a significant loss of life, some of which featured a 'stay-put' policy, in the vast majority of case evidence supports the suitability of continued application of the stay-put policy in purpose built high rise residential building, should they feature adequate fire safety provisions. This view is also supported in the post Grenfell, government and National Fire Chiefs Council Guidance (NFCC) . It is important to note the support for the suitability of the stay-put policy is on the basis of adequate fire safety provision particularly the structural fire resistance and compartmentation being in place.

To put this into context, in 2009-2010 there were over 8000 fires in multi-storey blocks of flats in the UK. In only 22 of these 8000+ occasions was the evacuation of more than 5 people with fire and rescue service assistance required. This indicated that the 'stay put' principle is undoubtedly successful in an overwhelming number of fires in blocks of flats.

Recent guidance from the NFCC states the following:

> *'NFCC supports the principle of a stay put strategy whenever possible, it reflects the Building Regulations requirement' that each flat should be its own fire-resisting compartment, and has proved over many years to be safe for residents of purpose-built blocks of flats.'*

A 'stay put' strategy relies on the fire separation between each flat to ensure that fire and smoke does not spread throughout the building unrestricted and uncontrolled. This fire separation is achieved through different means such as fire-resisting doors, fire-resisting walls, floors and ceilings separating flats, and ensuring that the external walls of the building adequately resist the spread of fire over the walls.

Therefore, it is essential that a suitable fire compartmentation scheme is maintained within the building to support the stay put policy; and, in addition, to this building's elements of structure are required to possess sufficient fire resistance, when exposed to a fire of predicted severity, to prevent structural collapse. These elements are considered further in subsequent sections of this report.

As the building has undergone a number of fire safety improvements it is considered that adequate fire safety measures, in particular fire compartmentation, fire resistance and the provision of sprinklers, are in place to support the 'stay-put policy'.

## 4.2 Landlord Areas

The evacuation strategy for the landlord areas will be simultaneous evacuation. The principle of this strategy is that any persons in the refuse rooms, plant room and lower ground floor are expected to make an escape. In order to support this evacuation strategy sufficient means of warning, lighting and evacuation routes need to be maintained. There are extended travel distances within the plant room area which is discussed in further detail later in this report.

# 5. Means of Warning

## 5.1 Flats

The fire detection and warning system for the AG building refurbishment was specified prior to production of this RFSS and without Cause and Effect being well understood. The specification of detection within the flats alters depending on the floor level of the building. Nonetheless the systems installed within the flats exceeds the minimum requirements noted within ADB for a Grade D2, Category LD3 standard in accordance with the relevant recommendations of BS 5839-6:2019 and is therefore considered sufficient.

Floors 1 – 7 have a Grade D1 Category LD2 system within each flat. A Grade D1 system consists of mains powered detectors with integral standby supply provided by tamper proof batteries. The following is provided:

- A smoke detector within the living room.
- A heat detector within the kitchen.
- A smoke detector within the hallway.

Floors 8 - 10 have a Grade D1 Category LD1 system within each flat. The following is provided:

- A smoke detector within the living room.
- A heat detector within the kitchen.
- A smoke detector within the hallway.
- A smoke detector within each bedroom.

Activation of any of the detectors within the flats will not cause activation of the alarms within any of the common areas of the building or within other flats (i.e. simultaneous building evacuation).

### 5.1.1 Regulation 38 – B1 Means of Warning - Flats

Design, Installation and Commissioning Certificates have been provided for each flat within the AG building, therefore, no recommendations are made in this regard. An example certificate has been provided in Appendix A: Regulation 38 Information.

### 5.1.2 Potential Shortfalls – Flats

2H Group Ltd have completed the Design, Installation and Commissioning of the fire detection and warning for the flats. They have selected a smoke alarm manufacturer that provides a limited range of detector heads, and the following functions are omitted:

- Remote monitoring
- Flashing strobe light
- Vibrating strobe pad
- Mechanical ventilation shut down

As the building was decanted to undertake the refurbishment, Personal Emergency Evacuation Plans (PEEPs) have not been undertaken to assess any additional occupant need. Therefore, the following recommendation is made.

**Recommendation 2: When the building is occupied SMBC Fire Safety teams should undertake Personal Emergency Evacuation Plans (PEEPs) for occupants that would be considered to have additional fire safety needs, such as, hard of hearing and non-ambulant persons.**

2H Group Ltd have utilised the local lighting circuit within each flat for the mains power supply, this meets with Section 15.4 of BS 5839-6:2019. However, inspection of the consumer units identifies the following requirement.

**Recommendation 3: Ensure that any device that isolates the power to the smoke alarms is labelled "CAUTION. SMOKE ALARMS CONNECTED TO THIS CIRCUIT. DO NOT SWITCH OFF".**

## 5.2 Common Lobbies and Stairs

Common fire alarm systems in residential common areas are not normally recommended for flats buildings as simultaneous evacuation of all occupants is not typically feasible or desired. The need for detection in such spaces is typically driven by the intended smoke venting arrangement of the common area.

Section 3.53 of ADB notes that in single stair buildings the smoke vents on the storey where the fire is initiated and the vent at the head of the stair should be activated by smoke detectors in the common parts.

The smoke ventilation schematics identify that two smoke detectors have been installed in each corridor within the AG building. These detector heads are designed to operate the newly installed Automatic Opening Vents (AOV's) located on the flank wall of each corridor and the AOV at the head of the corresponding stair. Figure 4 below provides the design intent for the smoke ventilation system within each core.

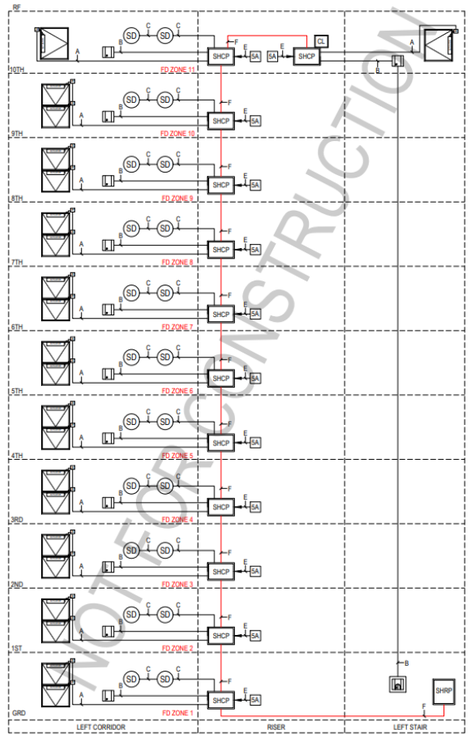



*Figure 4: AOV Schematic*

There are a number of design considerations for the landlords' fire detection and warning system within the AG building above the requirements of smoke ventilation, including the provision of early warning systems for the plant and lower ground floor, lift grounding and building management. The AG building is provided with a landlord's fire alarm system to the plant room only. The smoke detection installed for the building's smoke ventilation system is located in each corridor on each level. The AOV detector heads meet the EN54 requirement under BS 5839-1:2017 and are therefore considered suitable to interface with the lift.

It is recommended that the following interfaces for the landlord's system are incorporated into the fire alarm design, with external fire signal monitoring provided by an Alarm Receiving Centre. It is noted in discussion that the likely ARC is to be a Sandwell Council 24/7 staffed facility used for security purposes – Roway House.

**Recommendation 4: Ensure that the interfaces listed below are incorporated into the landlord's fire detection and warning system:**

1. **The lifts descend to ground floor upon activation of a smoke detector head within the protected corridors.**
2. **The lower ground floor fire detection, including the bin rooms, is connected to an Alarm Receiving Centre (ARC) to ensure early warning and intervention.**
3. **The plant room (roof level) is connected to an ARC**
4. **The VESDA system within the ceiling void of the 10th floor flats is connected to an ARC.**
5. **Activation of the sprinkler system is connected to an ARC.**
   **Nb. For the benefit of the ARC it should be noted that the system reliability of a sprinkler system in response to a fire is high and the rate of false activation is low. For these reasons it is a standard procedure for the ARC to inform the fire service of a confirmed fire rather than an alarm signal should sprinkler activation be flagged by the fire detection system. The fire service may otherwise operate a procedure to filter out low priority calls and provide a delayed response in order to avoid unnecessary turnouts.**

The landlord's system should therefore comply with the Cause and Effect Matrix provided in Appendix B and illustrated in Figure 5 below.

| CAUSE / EFFECT | Signal to Main Fire Alarm Panel | Signal to Remote Monitoring Facility | Door Access Release | Lift to Ground Floor | Activate smoke vent zone 1 | Activate smoke vent zone 2 | Activate smoke vent zone 3 | Activate smoke vent zone 4 | Activate smoke vent zone 5 | Activate smoke vent zone 6 | Activate smoke vent zone 7 | Activate smoke vent zone 8 | Activate smoke vent zone 9 | Activate smoke vent zone 10 | Activate smoke vent zone 11 | Stairwell Automatic Opening Vent (AOV) open | Shut down mechanical ventilation extract system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mains Failure | X | X | X | X | | | | | | | | | | | | | |
| Panel Fault/ System Fault | X | X | | | | | | | | | | | | | | | |
| Weekly Test | X | | | | | | | | | | | | | | | | |
| Annual Test | X | X | | | | | | | | | | | | | | | |
| Any Smoke Detector in Zone 0 Lower Ground Floor (Landlord's Area, including bin stores rooms) | X | X | X | X | | | | | | | | | | | | | |
| Any Smoke Detector in Zone 1 GF Corridor | X | X | X | X | X | | | | | | | | | | | X | |
| Any Smoke Detector in Zone 2 First Floor Corridor | X | X | X | X | | X | | | | | | | | | | X | |
| Any Smoke Detector in Zone 3 Second Floor Corridor | X | X | X | X | | | X | | | | | | | | | X | |
| Any Smoke Detector in Zone 4 Third Floor Corridor | X | X | X | X | | | | X | | | | | | | | X | |
| Any Smoke Detector in Zone 5 Fourth Floor Corridor | X | X | X | X | | | | | X | | | | | | | X | |
| Any Smoke Detector in Zone 6 Fifth Floor Corridor | X | X | X | X | | | | | | X | | | | | | X | |
| Any Smoke Detector in Zone 7 Sixth Floor Corridor | X | X | X | X | | | | | | | X | | | | | X | |
| Any Smoke Detector in Zone 8 Seventh Floor Corridor | X | X | X | X | | | | | | | | X | | | | X | |
| Any Smoke Detector in Zone 9 Eighth Floor Corridor | X | X | X | X | | | | | | | | | X | | | X | |
| Any Smoke Detector in Zone 10 Ninth Floor Corridor | X | X | X | X | | | | | | | | | | X | | X | |
| Any Smoke Detector in Zone 11 Tenth Floor | X | X | X | X | | | | | | | | | | | X | X | X |
| Any Smoke Detector in Zone 12 Tenth Floor Plant Room | X | X | X | X | | | | | | | | | | | | X | X |
| VESDA System to Roof Void (Zone 137) | | X | | | | | | | | | | | | | | | |
| Activation of sprinkler fire suppression anywhere within building* | | | | | | | | | | | | | | | | | |

*for the purposes of the ARC this should be taken as an indicator of a confirmed fire.

*Figure 5: Landlord cause and effect table*

## 5.3 Plant Room – Aspirating System

The 10th floor plant contains an aspirating system within the roof voids. A schematic of the system is provided in Figure 6. The commissioning certificates are provided in Appendix A. It is understood that the Very Early Smoke Detecting Apparatus (VESDA) system has been installed to compensate for the design of the new curved roof above the flats.

The curved roof design of the tenth floor resulted in a confliction with, maintaining air flow in the roof, and being able to take the compartment wall of the flats to the underside of the curved roof. The compartment wall separating the flats from the protected corridor has not been carried to the underside of the roof. A fire barrier has been completed utilising a fire stopping solution of ablative batt and intumescent coating, with rockwool into the eaves. A service void has been installed within the 10th floor flats above the entrance hall and a VESDA (Very Early Smoke Detection Apparatus). The fire compartmentation for the flats is discussed separately.

Utilising highly sensitive smoke detection in concealed voids or cavities areas that are difficult to access is a reasonably practicable approach to ensure occupant safety and property protection. It is expected that the VESDA system will activate in the very early stages of a fire within the void. The sprinkler system within the flats will control or extinguish a fire prior to breaching the flat compartment. Therefore, subject to Recommendation 4, no further recommendations are made in this regard.

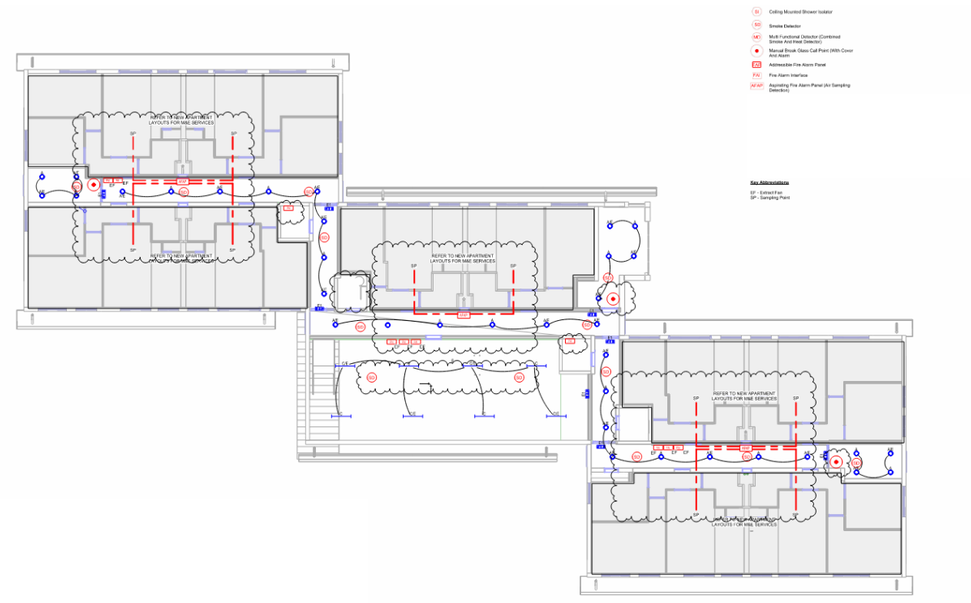


*Figure 6: Schematic of aspirating fire detection*

# 6. Means of Escape

The design principles of residential flat type buildings are heavily reliant on fire compartmentation and smoke venting provisions and current guidance for such buildings reflect this. Where deficiencies in either of these two provisions occur in existing buildings, the impact this would have in a fire scenario needs to be reviewed and the necessary provisions put in place to ensure a reasonable standard of fire safety provisions are provided.

## 6.1 Means of Escape from within the Flats

ADB [3] recommends that travel distances within a flat, which is located in a building within a storey more than 4.5 m above ground level, to the entrance door should be limited to 9m from any point in a flat unless an internal protected entrance hallway is provided. The guidance which is understood to have been current at the time the flats were constructed did not require a corridor to be fire resisting but instead required the entrance hall to have no fire hazard (which in reality cannot be managed) and that the living room, dining room and kitchen doors were required to be fire-resisting and self-closing.

The travel distances within each flat is limited to approximately 9m from the furthest point within the flat, as measured on site and shown in Figure 4.1 below. This includes both flat architypes (one and two bed). On this basis a protected entrance hall within the flats is not required. However, protected entrance halls have been provided within each flat. The arrangement is considered acceptable.

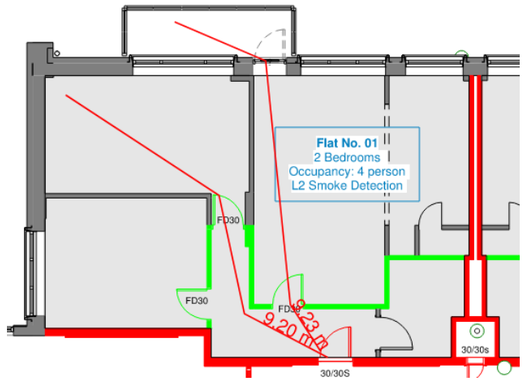



*Figure 7: Travel distance in two-bedroom flat layout*

The inclusion of a protected lobby, in addition to increasing the safety of the flat occupants, also raises two other considerations. The lobby protection also adds an additional fire door between a likely seat of a fire in a room and the access to the dry riser outlet which the fire service may choose to use at the fire floor. Fire service access is discussed further in Section 12.3. However, given the creation of protected lobbies, an issue is created due to the ventilation system employed in the flats. This is discussed in detail below.

### 6.1.1 Ventilation – Flats

The flats have a suspended ceiling comprising of 15mm gypsum soundboard (or similar) containing a number of service runs, resulting in low ceiling heights at approximately 2.2m. Given the floor area, historically, it is likely that the AG flats will have suffered with increased moisture retention and condensation leading to mould growth. To counter this, SMBC have installed a Nuaire Flatmaster mechanical ventilation system within each flat and trickle ventilation within each window. The unit is located within the kitchen area, the input grille is located on the external wall and a discharge vent is sited above the bathroom door. Figures 4.2 and 4.3 provide further detail on the system.

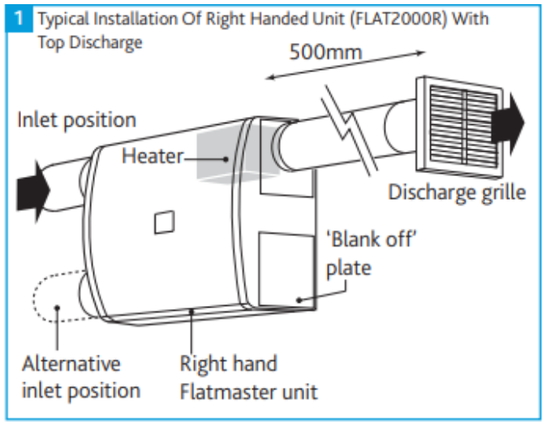



*Figure 8: Flatmaster Schematic*

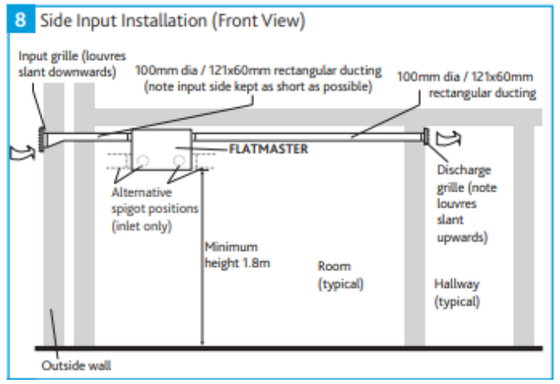



*Figure 9: Flatmaster installation arrangement*

ADB provides the following recommendations regarding air circulation systems within flats with a protected entrance hall or protected stair.

For systems circulating air only within an individual flat, take all of the following precautions:

a) Transfer grilles should not be fitted in any wall, door, floor or ceiling of the enclosure.
b) Any duct passing through the enclosure should be rigid steel. Joints between the ductwork and enclosure should be fire-stopped.
c) Ventilation ducts serving the enclosure should not serve any other areas.
d) Any system of mechanical ventilation which recirculates air and which serves both the stair and other areas should be designed to shut down on the detection of smoke within the system.
e) For ducted warm air heating systems, a room thermostat should be sited in the living room. It should be mounted at a height between 1370mm and 1830mm above the floor. The maximum setting should be 27°C.

Based upon the site inspection and the information contained within the project folder, it is understood that the Flatmaster system will not shut down in the event of a fire. As the discharge grille is in the entrance hallway and given the low ceiling heights, it is considered that it would be good practice for the system to

'fail safe' and switch off upon smoke detection, thus helping to ensure occupants can evacuate safely. However:

- There is a sprinkler system in each flat,
- Relevant ADB guidance for this type of system specifically references a need for a fire detection interlink only for protected internal flat stair enclosures., o
- The ductwork for the Flatmaster is above the plasterboard ceiling.
- There is a good standard of automatic fire detection within all flats.
- The air entrainment if from outside of the building.

### 6.1.2 Means of Escape from Flat Balconies

ADB refers to BS 9991 [6] for the means of escape from balconies:

For private balconies and terraces more than 4.5 m above ground level, the following recommendations should be met.

a) The escape route from the balcony or terrace (open or enclosed) should not pass through more than one access room.

b) Either the interior of the access room should be clearly visible from all parts of the balcony, or a fire detection and fire alarm system in accordance with BS 5839-6:2019+A1 should be provided, with detection in the balcony access room and giving warning that is audible on the balcony with the external doors in the closed position.

c) Any cooking risk in the access room should be enclosed with fire-resisting construction or meet the recommendations given in 5.6.

d) Where the travel distance from the balcony access door to the furthest point on the balcony exceeds 7.5 m, either:

1) there should be an alternative escape route from the balcony without going via the same access room; or

2) a fire detection and fire alarm system in accordance with BS 5839-6:2019+A1 should be provided, with detection in the balcony access room and giving warning that is audible on the balcony with the door in the closed position.

The balconies on the AG building are relatively small with a travel distance of approximately 3m. The flats are fitted with a fire detection and warning system in accordance with BS 5839-6 and the interior of the access room (of which there is only one) is visible from the balconies. Whilst the kitchens are considered open plan and forming part of the access rooms, they are located as far from the access room as is reasonably practicable given the flat sizes. There is also a sprinkler system fitted in each flat in accordance with BS 9251:2021.

**Recommendation 5: Test the smoke alarm audibility (taken to be 65dB) within the flats, to ensure that they can be heard on the balcony with the door in the closed position. If not, or persons that are hard of hearing (PEEP users) would be unable to hear the alarm, then a visual/ audible device connected to the alarm system should be installed within the balconies.**

## 6.2 Means of Escape from the Common Areas

ADB recommends that a person escaping through the common area, if confronted by the effects of a fire in another flat, should be able to turn away from it and make a safe escape via an alternative route. The maximum travel distances for escape in more than one direction is 30 m.

Occupants of the AG building can evacuate via two routes from each Core, with each Core provided with a protected stair. The travel distance assessment is provided in Figure 4.5. The arrangement is considered acceptable.

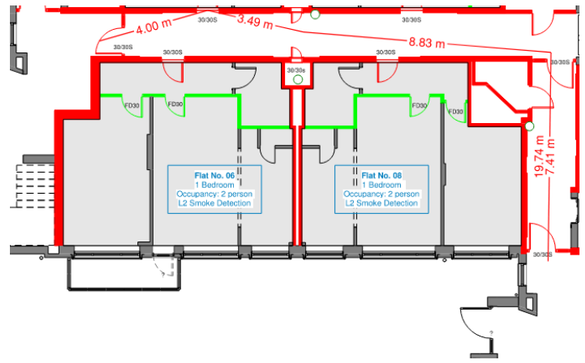



*Figure 10: Travel distances from flats through common areas.*

### 6.2.1 Corridor Ventilation

Both current design guidance and previous standards for purpose-built blocks of flats recommend that measures be provided to ensure that escape routes remain free of smoke. However, different approaches have been employed in order to achieve this, and, indeed, the philosophy behind smoke control design has changed over the years.

The current benchmark design guidance is based on using smoke control to protect the common stairways. While this might afford some protection to the corridors and other horizontal routes, this is not the design intent. The emphasis in previous design guidance has been on protecting not only the stairways, but also the entire horizontal route to them.

Current guidance within ADB dictate that the lobby adjoining the stair should be provided with a means of smoke ventilation in all but small (i.e. 3 stories, < 11 m above ground) block of residential flats.

ADB provides the following recommended approaches for smoke ventilation of the common space; whereby the smoke vents provided must meet one of the following:

- They should be located on an external wall with minimum free area of 1.5m$^2$.
- They should discharge into a vertical smoke shaft, closed at the base that meets a number of criteria.

In addition to ventilation of the corridor ADB also requires that ventilation is provided to the head of the escape stair.

ADB required the provision of Automatically Opening Vents (AOVs) which open on the storey where the fire is initiated, and the vent at the head of the stair, and should be activated by smoke detectors in the common parts. In buildings with more than one stair, smoke vents may be activated manually.

Alfred Gunn House does not feature any smoke venting provisions to the stair lobbies and so does not meet the requirements of ADB. Further, owing to the physical constraints of the building neither could be incorporated with any ease; the stair lobby features no external walls and so would require the installation of a shaft throughout the full height of the building.

In the case of flats constructed between 1971 and 1985, CP3 chapter IV part 1: 1971 would have provided the current guidance of the time giving recommendations for precautions from fire in flats and maisonettes over two storeys. In the case of conventional corridor access (i.e. without alternative means of escape from the dwellings), two alternative methods of smoke control were specified in the guidance as follows:

In smoke containment, the entrance door of every dwelling was to be no more than 4.5m from a door to a fire door to a main stairway, to a fire door across the corridor or to the door to a ventilated lobby. If the design was such that the 4.5m distance was to a cross-corridor door, and any other flat entrance door was located between the cross-corridor door and the stairway, there was to be an alternative means of escape to a further stairway. Alternatively, the flats could open into a ventilated lobby and have entrance doors no further than 4.5m from a door separating the lobby from a corridor that led to a stairway.

In smoke dispersal, reliance was placed on cross-ventilation of the corridor, uninterrupted by cross-corridor doors. The cross-ventilation could be provided by manually opened vents, together with either permanent vents or automatically opening vents operated by smoke detectors. Dead end corridors were limited in length to 15m, but, where there is escape in two directions, the travel distance from a flat entrance door to a stairway could be 40m.

The building currently features two large permanently open vents (POVs) on each floor at either side of the building as a means of venting smoke. The common escape route is however split into three separate sections (2x common corridors and a lobby to the stairs) which are subdivided by two cross-corridor doors and so with the provision of these door the cross-ventilation method of smoke dispersal would not be valid. The approach adopted meets the smoke containment approach of CP3 chapter IV part 1 in that the flats open into a ventilated lobby and have entrance doors no further than 4.5m from a door separating the lobby from a corridor that leads to a stairway.

Nonetheless, it is unclear if the doors and their associated partitions were in place at the time of construction or were added at some point in the history of the building to change the smoke control philosophy to a smoke containment approach. This could be the case given that the smoke dispersal method using cross-corridor ventilation in particular with permanently open vents is no longer seen as an acceptable as it has been shown to be vulnerable to failure as a result of wind direction and pressure or being undermined by residents who block the permanent vents because of discomfort.

In either case, whether or not the doors were in place at the time of construction, the building as it stands currently follows the smoke containment approach which is still the current approach. However, smoke venting is provided to the corridor sections as opposed to the lobby to the stair itself as would be required by current benchmark guidance.

Whilst this approach does not meet current guidance, and the use of POVs do not provide an optimum solution given that the openings bridge all floors and so would permit smoke passage between the floor of fire origin to other floors (dependent on wind conditions), travel distances in the common areas are low and the approach is not that far removed from current benchmark guidance.

### 6.2.2 Stair ventilation

ADB requires that a vent to the outside with a minimum free area of 1m² should be provided from the top storey of the stair.

As stairs will be used by the majority of the occupants of the building, potentially for a longer duration than the common escape routes on the floor of fire origin, as well as being an access and egress route for the Fire and Rescue Service, it is considered of primary importance to protect the stair(s) irrespective of the design of the smoke ventilation system.

The ability of the system to prevent smoke from entering the staircase is affected by the proximity of the apartment door to the staircase. Although there is no control on this proximity in many design guides, including ADB and BS 9991, where possible, apartment doors should not be located in close proximity to doors to the staircase. Some smoke leakage into the staircase due to thermal expansion of hot gases in the fire zone (apartment of fire origin) may occur irrespective of the door location. This is because fire induced expansion of gases can result in a build-up of pressure, leading to a rapid flow of hot gases out of the compartment when the apartment door is opened, especially if the staircase door is already open. However, in most cases, the initial expansion forces dissipate quickly and the leakage of smoke into the stair due to this action is limited.

For each stair, the head of the stair has an AOV estimated to have a minimum free area of 1m² each, located on the external wall. Whilst it is expected that there will be some stratification of cold smoke within the stair the arrangement is considered acceptable to meet the requirements of ADB.

## 6.3 Means of Escape from Landlord areas

### 6.3.1 Lower ground

The lower ground floor area is relatively open plan given the scale of refurbishment works undertaken, due to the removal of the building's gas supply and the introduction of new electrical services. Figure 1.3 (taken from the fire strategy drawings) of this report identifies that a protected escape corridor is in place. However, the figure below, taken from the 'Lighting, Emergency Lighting & Fire Alarm' M&E drawing pack, is more representative of the current arrangement.

*Figure 11: Lower ground layout*

A travel distance assessment is provided in Figure 4.7. The assessment has been completed using the fire strategy drawings and is based on the limits of travel distance to the nearest exit at 45m, noting that alternative exits may be further away. Each area of the lower ground is provided with two directions of travel and occupants will move into a place of relative safety when passing through each Core to access an alternative final exit. The arrangement is considered acceptable.

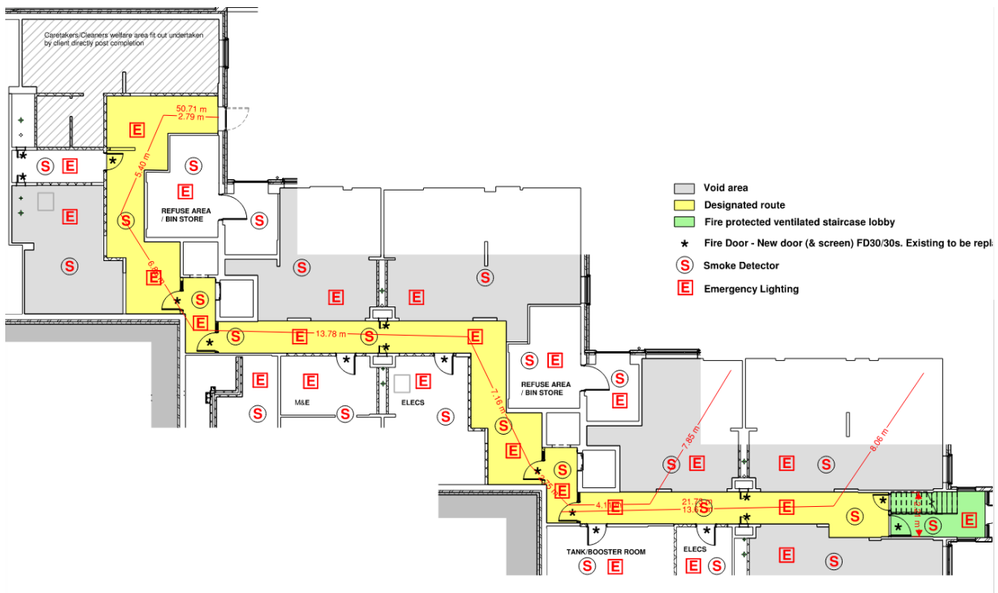



*Figure 12: Lower ground travel distances*

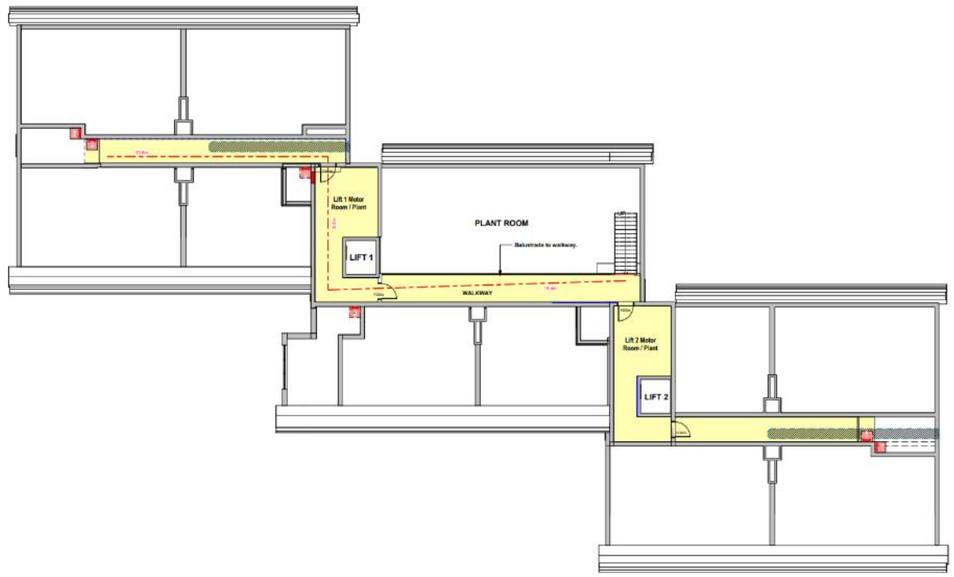



*Figure 13: 11th floor travel distances*

### 6.3.2 Means of Escape from the Roof Top Plant Area

There is a Plant room located on the 10th floor in Core A as can be seen in Figure 2. The plant room contains a mezzanine area from which a door provides access to a corridor at the 11th floor level, this leading through the lift motor rooms for both lifts and travelling on for a further 9m. The 11th floor arrangement is shown in Figure 13 below. Occupants working in this area are subject to dead end conditions on either side of the lift motor room. The maximum travel distances from the furthest point on the 11th floor, travelling back to and through the plant room via the mezzanine stair to the protected corridor from where a change of direction could be taken on the 10th floor, equates to 55.5 metres.

ADB states a maximum single direction of travel from within a plant room of 9m. Whilst the plant room is a large volume space with a high ceiling, it is not thought reasonable to permit excessive travel passing through the plant room as it does contain a fire load resulting from an array of electrical equipment and cabling associated with rooftop communications equipment. The extent of the corridors on the 11th floor also creates a situation where there are two access rooms to the inner room created at the furthest segment of the corridor. Additionally, the entry point into the plant room from the 11th floor is at a high level which would be the first area of the room to be affected by smoke in the event of fire. The 55m is excessive and an alternative means of escape should be provided from the 11th floor corridors which avoids passing through the plant room.

There is an access hatch in each of the lift motor rooms in the floor between the 10th and 11th level, the purpose of which is to be able to hoist equipment into motor room in the event of repair or maintenance work being carried out. These hatches are fire rated from below forming part of the fire compartment floor. It is proposed that the method of opening the hatches from the lift motor room be simplified to be able to open them in an emergency – this being in the situation where there is a fire in the plant room and the means of escape is then compromised. In such circumstances, opening the hatch and having access to an easily deployable ladder would allow the plant room to be by-passed. Any fire in the plant room would be contained by the fire doors which open onto the plant mezzanine area from the motor rooms. This proposed arrangement is illustrated in Figure 14 below where the hatch locations are marked in red and Figure 15 illustrating the deployable ladder arrangement.

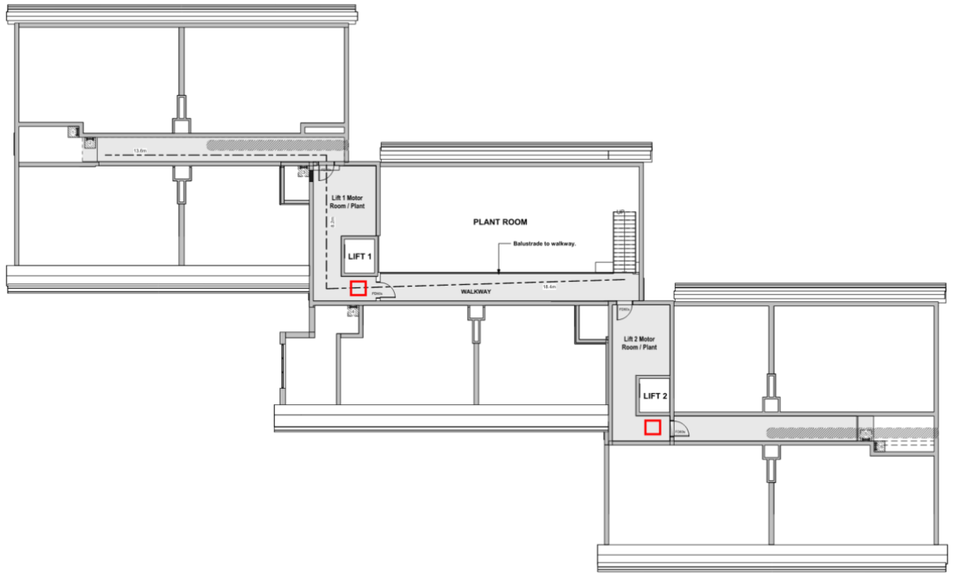



*Figure 14: 11th floor hatch locations*

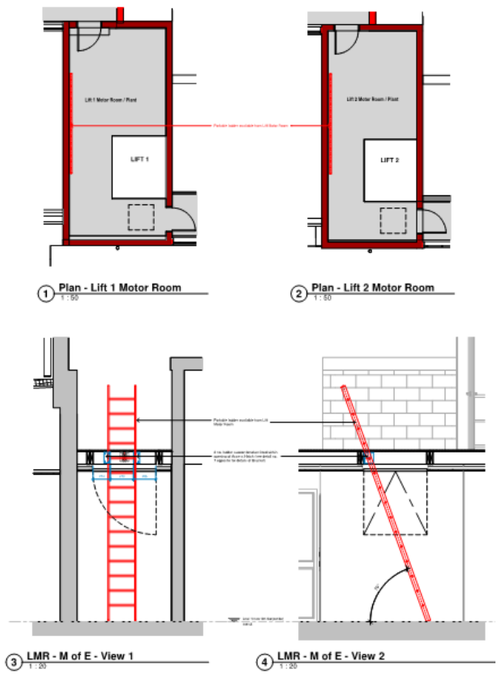



*Figure 15: Illustration of deployable ladder*

**Recommendation 6: Provide a deployable ladder and a readily openable hatch in each lift motor room to provide an alternative means of escape that doesn't require passing through the plant room.**

## 6.4 Door Hardware on Means of Escape

Doors on the common escape route, including the final exit from the building, should meet the following requirement of ADB:

- be fitted only with simple fastenings that can be operated from the escape side of the door without the use of a key;
- be hung clear of any change of floor level;
- be hung so that they do not reduce the effective width of any escape route across a landing;
- if opening into a corridor, be recessed to the full width of the door;
- where hung to swing both ways (double swing), or subdividing corridors, be provided with a minimum of a vision panel;
- open to an angle not less than 90°.

Further to the above, where access control systems or electronic locking mechanisms are provided security requirements should not override the need to provide adequate means of escape. All security locks and/or devices on an exit door should be openable from the escape side by a single manual operation not requiring the use of a key.

It was noted on inspection that 'thumb turns' are provided on the interior of the flat doors, therefore no recommendations are made in this regard.

The three main entrance doors are electronically controlled. These will fail safe in the event of power failure, however it is not thought necessary that they unlock in the event of a fire alarm activation. This is primarily driven by building security, as there would be no clear reset procedure if the fire detection were activated, potentially leaving the building unsecure for a considerable time. Given that the entrance doors are in lobby areas off protected corridors, that all three exits are accessible from anywhere on the ground floor and there is a 'stay put' arrangement in place, this arrangement is thought reasonable.

## 6.5 Emergency Lighting

Emergency lighting would be required to be installed to provide temporary illumination in the event of failure of the primary power supplies to the normal lighting system. Adequate artificial lighting should be provided in all common escape routes.

Emergency lighting would also be installed in accordance with the recommendations of BS 5266-1 , BS EN 1838 2024 [32], and BS EN 60598-2-22 [32]. The system would be required to provide emergency lighting for 3 hours in the event of a mains power failure.

Emergency lighting installation would illuminate all internal circulation routes, refuse stores, plant rooms, all final exits from the buildings and firefighting equipment.

Primary and emergency lighting would be required for any external escape routes that will not be lit by surrounding street lighting.

*Table 4: Emergency lighting locations*

| Parts of the Building | Areas Requiring Escape Lighting |
|---|---|
| Ancillary areas | All escape routes including external escape routes. |
| Residential | All common escape routes (including external escape routes). |

Luminaires would require to be provided, appropriately spaced, to provide the light levels suggested within British Standard BS 5266, see *Table 5* below.

*Table 5: Illuminance for specific locations*

| Location | Response Time (s) | Min Illuminance (lx) | Min Duration (h) | Reference Plane |
|---|---|---|---|---|
| Defined Escape Routes. | 5.0 | 1.0 | 3.0 | Centre line of the escape route. |
| Undefined Escape Routes. | 5.0 | 0.5 | 3.0 | Floor level excluding border of 0.5m around the perimeter of the room. |
| Plant Rooms, Switch Rooms and Emergency Winding Facilities for Lifts. | 5.0 | 15 | 3.0 | In plane of visual task. |
| Fire Alarm Control and Indicating Equipment. | 5.0 | 15 | 3.0 | In plane of visual task. |
| Reception Areas. | 5.0 | 15 | 3.0 | In plane of visual task. |
| Security Devices. | 5.0 | 5.0 | 3.0 | Horizontal on plane of panic bar / pad; vertical at vertically mounted / wall mounted security devices. |

Newly installed emergency escape lighting has been provided within the AG building. During the visual survey the emergency lighting provision seemed to be broadly sufficient, in terms of layout; a self-contained emergency lighting unit was noted to be provided in each of the section of the common areas of the building (i.e. common lobbies and stair). A review of the specification and drawing pack identifies that a 3 hour non-maintained emergency battery backup has been provided within the luminaires. However, emergency lighting should be provided on the external faces of the building, noting that sufficient street lighting can be claimed to help facilitate to escape.

**Recommendation 7: Confirm if the front and rear of elevations areas of the building are provided with functioning emergency lighting to a sufficient standard; if emergency lighting is not provided in these areas, it should be installed in line with the requirements of BS 5266-1.**

### 6.6 Fire Safety Signage

All signage should meet the recommendations of BS ISO 3864-1, BS 5499-4 and BS EN ISO 7010.

Escape signage would be required to be located as follows, except for escape routes which are in ordinary use:

- All designated escape routes or escape routes across open areas provided with signage, especially stairs and other changes in level and direction.
- The position of all doors and other exits sited on escape routes, including storey exits and final exits will be identified by signs.
- Where an escape route from a room is not conspicuous or confusion could occur, the route will be indicated by a sign, including intermediate signs where necessary.
- All changes of direction in corridors, stairways and open spaces forming part of an escape route will be marked with intermediate signs. Each intermediate door or junction will be similarly signed.

Fire resisting doors in the common areas, excluding the entrance doors to apartments, would be signed with 'Fire Door Keep Shut' and riser doors would be signed with 'Fire Door Keep Locked'.

Firefighting equipment, including the ventilation controls and overrides in and around the building, would be provided with signage.

## 7. Active Fire Safety Systems

### 7.1 Automatic Water Fire Suppression

All residential units have had sprinkler suppression installed that is compliant with BS 9251. On the basis of the size of building this is assumed to be a Level 3 system. The water tank and pump system are located in the LG floor.

Normally it is the case that life safety systems, including the sprinkler pump assembly and water tank, are enclosed within 120 minute fire resisting construction to ensure that they are available on demand even when there is a fire in a nearby section of the building. On the LG floor the main fire hazards are the bin stores, however these are located in separate fire resistant enclosures. As the sprinkler provision is specifically for life safety resulting from a fire in the residential units then a fire in the LG floor would be unlikely to compromise safety of the residents due to fire spread given the compartment floor between LG and G, and the level of fire compartmentation within the LG itself. For this reason, it is thought that the arrangement for the fire protection of the life safety systems is adequate. However, should a fire on the LG floor occur and compromise the functionality of the sprinkler system then the residents would be left without a key safety feature until the sprinkler capability be reinstated. It should be part of Sandwell's emergency plan to determine an acceptable course of action if this was the case.

# 8. Fire Compartmentation

## 8.1 Compartmentation and Fire Resisting Construction

The minimum requirements for the provision of compartmentation and fire resisting construction, as well as associated fire doors, are shown in the table below, as per requirements of ADB Vol. 1 and ADB Vol. 2.

As the building is a residential building, all floors will be designed as compartment floors.

Any penetrations in the fire resisting construction will be fire stopped to maintain the same fire resistance.

*Table 6: Compartmentation and fire resistance requirements*

| Area | Fire Resistance Requirements | Exposure | Fire Doors (minimum requirement) |
|---|---|---|---|
| Compartment floors. | REI 60 | From underside | - |
| Residential apartment enclosure. | REI 60 | Form each side | FD 30S |
| Common corridors and lobbies. | REI 30 | From each side | FD 30S |
| Apartment protected hallways. | REI 30 | From each side | FD 20 |
| Risers and shafts. | REI 60 | From each side | FD 30 |
| Protected stairs. | REI 60 | From each side | FD 30S |
| Separation between residential and ancillary areas. | REI 60 | From each side | FD 30S |
| Places of special fire hazard. | REI 30 | From each side | FD 30 |
| Period of resistance for Loadbearing (R), Integrity (E), Insulation(I).<br>Places of special fire hazard include oil-filled transformer rooms, switch gear rooms, boiler rooms, storage spaces for fuel or other highly flammable substance, rooms that houses a fixed internal combustion engine.<br>Fire door sets to consist of a complete door set as defined by BS 8214: 2016. This includes door leaves, frames, cold smoke seals and closers where applicable. Fire doors should meet the Sa classification when tested to BS EN 1643-3 or have a leakage rate not exceeding 3m3/m/hour (from head and jambs only) when tested at 25 Pa under BS 476-31.1. | | | |

### 8.1.1 Observations on compartmentation from site visit

#### 8.1.1.1 Flats

The fire compartmentation requirements for the flats has been identified as REI60 minutes fire resisting construction.

Historically, fire safety measures have been specified by reference to prescriptive codes that provide standard solutions for a given set of building parameters. For many buildings of straightforward construction, layout and use, prescriptive codes and standards provide the designer with an acceptable solution. However, these codes have to account for a wide range of buildings and will often not provide the optimum solution property protection, operational requirements and cost-effective fire protection.

As discussed in Section 5.3 the Building Regulations identify the need to maintain air flow and eliminate the possibility of condensation within roof voids. Therefore, the walls at the perimeter of the 10th floor apartments, along the eaves & verges, have not been taken up to the underside of the roof.

To prevent the passage of fire and smoke within the eaves and verges at compartment lines the design incorporated a 100mm foil faced rockwool slab with has been sealed to the perimeter of the eaves/verge profile, in addition, for 500mm either side of the party wall line the construction has fully filled the eaves profile with rockwool insulation.

Coated Ablative batt has been used to seal the ends of PW/Corridor walls where they abut the perimeter wall construction.

#### 8.1.1.2 Party Walls

Flat walls should be of 60 minutes fire resistance (REI 60).

The detail listed is a standard British Gypsum White Book design, which is an accepted certified means of achieving the required fire resistance, see Figure 16 below.

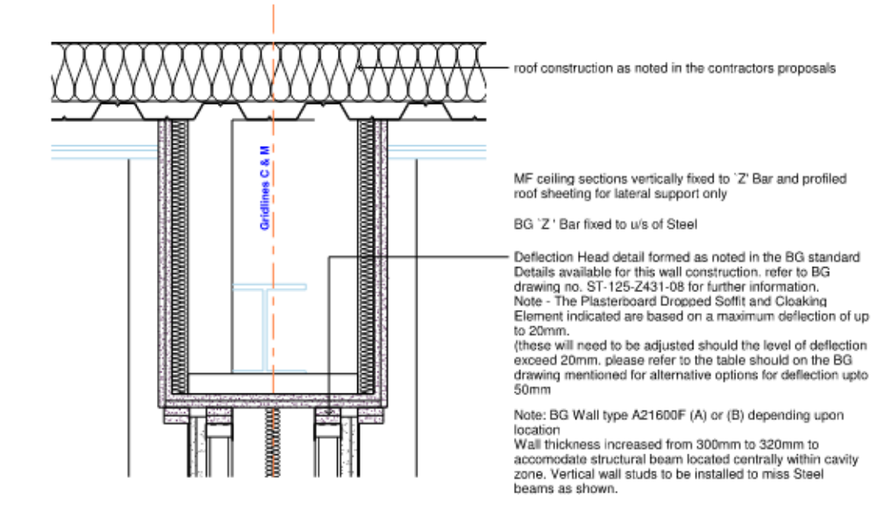



*Figure 16: Eaves detail*

## 8.2 Eaves Fire Stopping

Approved Document B requires that the junction of the compartment wall with the roof should be continued across an eaves.

shows the location of the junction of the party wall with the roof. At this point the eaves detail shown in Figure 16 is employed. This is not a standard detail, but the objective to prevent burn around of the party wall appears to be maintained with ablative batt, mineral wool and the cementitious sheathing board.

There is no evident route for the passage of fire products and therefore the functional requirement of Building Regulations is considered to be met.

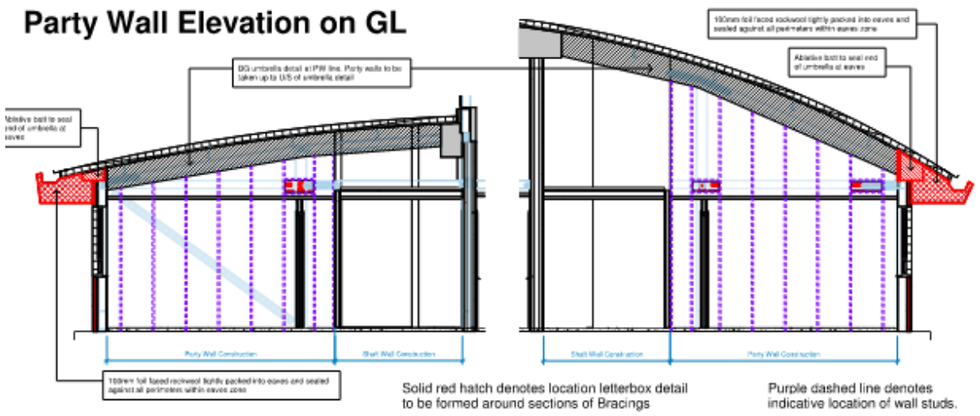



*Figure 17: Eaves overview*

## 8.3 Fire Stopping and Penetrations Through Fire Resisting Construction

Fire-stopping would be provided at the junction of fire-separating walls and external walls in order to maintain the fire resistance period of fire-separating walls, and thereby prevent a fire from travelling around the junction and into the neighbouring space.

Penetrations through lines of fire-resisting separation should be fire-stopped to achieve the same fire resistance as the separating elements.

Fire collars are required where any kitchen / bathroom duct vents pass through external structural framing system (SFS).

All pipes, ductwork and services passing through fire-resisting separations should either be enclosed in fire-resisting construction (i.e., shafts) of matching fire resistance or provided with fire dampers of matching fire resistance. Certain small diameter pipes require only fire-stopping around the pipe, dependent on pipe material and the type of fire-resisting barrier penetrated. Further information is available in Table 9.1 of ADB Vol 1.

Pipes that pass through a fire separating element should meet one of the following provisions:

**Proprietary Seals**
Provided a proprietary sealing system which has been shown by test to maintain the fire resistance of the wall, floor or cavity barrier.

**Restricted Pipe Diameter**
Where a proprietary sealing system is not used, fire stopping may be used around the pipe, keeping the opening as small as possible.

**Sleeving**

A pipe of lead, aluminium, aluminium alloy, fibre-cement or UPVC, with a maximum nominal internal diameter of 160mm, may be used with a sleeving of non-combustible pipe. The opening in the structure should be as small as possible and provide fire stopping between the pipe and structure. The sleeve should extend no less than 1000mm on either side of the structure.

### 8.3.1 Observations on fire stopping from site visit

The quality of fire stopping observed throughout the building varies in terms of quality. It was noted that fire stopping had generally being completed well but there was some evidence in places of services passing through fire boundaries which had not been fire stopped. Further to this, the new electrical cabling installed within the building is required to be secured with support cables with fire resistant fastenings and fixings which resist premature collapse in fire conditions. Consequently, plastic cable clips, plastic cable trunking and non-metallic cable ties cannot be used as the sole support method for wiring systems and so Recommendation 11 has been identified.

**Recommendation 8 With regards to BS7671, 17th Edition, Amendment 3, the electrical cabling within the lower ground floor should be provided with fire resistant fastenings and fixings which resist premature collapse in fire conditions. It is recommended that horizontal cabling (overhead) should be secured at maximum 300mm spacings, with vertical cabling (wall) secured at 500mm.**

With regard to the fire stopping visually inspected, the majority of works appear to have been completed as part of the refurbishment by fire stopping contractors; labels are generally attached which indicate the works have been completed by accredited contractors. Nonetheless, there were a number of penetrations inspected where fire stopping appear to be substandard either due to a poor standard of workmanship or the use of inappropriate fire stopping material.

It is not possible to inspect every item of fire stopping with the scope of this assessment and whilst the majority of fire stopping was observed to be in a satisfactory condition, there were some elements which either lacked fire stopping or required remediation.

**Recommendation 9: Those penetrations which are missing fire stopping, or which have inadequate fire stopping should have remediation work carried out in order to bring them up to an adequate standard.**

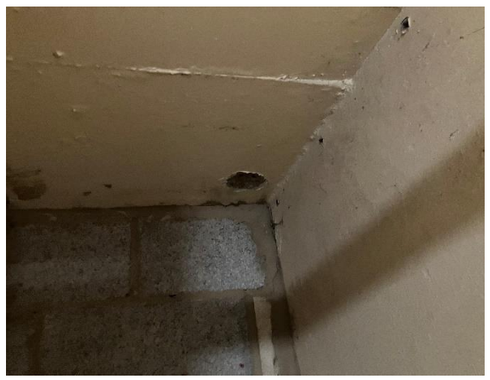


*Figure 18: Penetration to LG ceiling slab*

*Figure 19: Penetration through ventilation block*

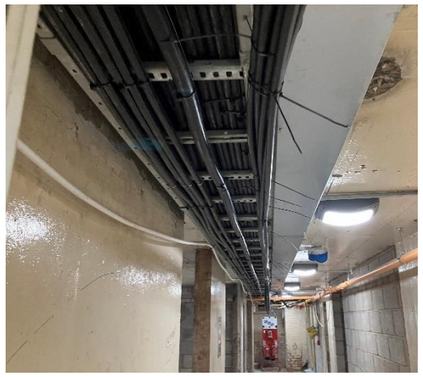


*Figure 20: Cable installation LG*

*Figure 21: Absence of fire stopping*

*Figure 24: Flat service penetration*

*Figure 25: Flat service penetration*

*Figure 22: Pipework through floor slab*

*Figure 23: Exposed trunking*

*Figure 26: Floor slab of refuse room chute*

*Figure 27: Floor slab of refuse room chute*

## 8.4 Concealed Spaces

Cavity barriers should be provided to prevent the rapid spread of unseen fire or smoke in voids and to prevent the spread of fire around compartmentation via voids and concealed spaces.

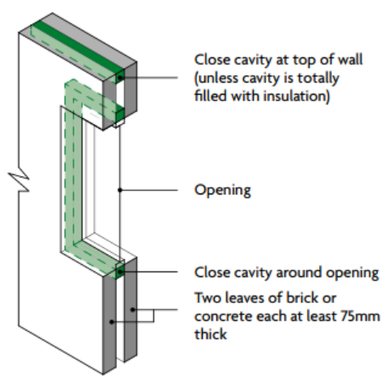
Concealed cavities (e.g., voids in partition walls, roof voids, voids between suspended ceilings and the soffit of the floor above) should be provided with cavity barriers to sub-divide them as outlined within Diagram 8.1 of ADB Vol. 1.

In general, cavity barriers should be at 20 m centres within cavities and formed exclusively of Class C-s3, d2 materials or better. For other materials, the spacing between cavity barriers should be reduced to 10 m.

In voids above or below large rooms, cavity barriers may be at up to 40 m centres in either direction, provided there are also cavity barriers provided along the lines of the enclosing walls / partitions of that room and cavity linings are exclusively Class C-s3, d2 or better.

Cavity barriers should achieve 30 minutes integrity fire resistance (E) and 15 minutes insulation (I) fire resistance.

Cavity barriers should be within the external wall cavity, positioned to align with the internal fire resisting walls and floors, unless constructed in line with Diagram 5.3 of ADB Vol. 1, presented below for ease of reference. Cavity barriers should also be installed to seal around any openings (windows or doors) in the external wall.




**NOTES:**

1. Materials used to close the cavity in this arrangement do not need to achieve a specific performance in relation to fire resistance.
2. Domestic meter cupboards may be installed provided that the following conditions are met:
   a. There are no more than two cupboards per dwelling
   b. The openings in the outer wall leaf are not bigger than 800×500mm for each cupboard
   c. The inner leaf is not penetrated except by a sleeve not more than 80×80mm, which is fire-stopped.
3. Materials achieving class B-s3, d2 or worse may be placed within the cavity.

*Diagram 5.3 of ADB Vol.1*

The non-intrusive nature of the site visit to AG House means that no direct observations were made and and therefore no conclusions can be made as to the suitability of cavity barrier provision.

## 8.5 Refuse chutes

The refuse chutes for all floors are situated in a riser room, accessed from the common corridor.

Without the implementation of sufficient fire protection measures a fire within the refuse store could impact on common corridors and adjacent stairs potentially rendering them impassable as fire and smoke may pass up the refuse chute.

As such ADB recommends that refuse chute be housed within a room of their own, accessed via a protected lobby with smoke ventilation provided by a 0.2m² permanent vent from each level. This could be via a fire rated horizontal duct direct to outside air or a vertical shaft to roof level.

In comparison LGA guidance for existing purpose building flats recommends that refuse and chute rooms should:

- Ideally be approached directly from the open air or by way of a protected lobby with permanent ventilation.
- Be separated from all other parts of the building by 60-minutes fire fire-resisting construction.
- Not be located within protected stairways or protected lobbies.

Guidance relating to refuse chutes and access hatches that open directly onto protected stairs and lobbies recommends that an automatic fire resisting shutter operated on a fixed temperature fusible link should be fitted to the base of the refuse chute to restrict the spread of fire and smoke. In addition, an automatic fire suppression system should be provided by a sprinkler head located on the bins at the base of the chute. Both of these measures have been provided in the AG building.

The AG refuse chutes access hatches are situated within two refuse chute riser rooms, rather than direct access from the corridor or stair. The refuse riser rooms have not been provided with smoke detection, however the FD30s access door to the riser rooms are fitted with a viewing pane, which would alert occupants to the potential of a deliberate or self-actuating fire (e.g. lithium ion battery disposal) within the chute/ riser room. The chute is of concrete construction and the walls to the riser room are of blockwork construction and as such are expected to meet the minimum requirement of 60 minute fire resisting construction.

It is noted that the concrete chute is fitted with a wall mounted extract grill that connects to the fans located in the 10th floor plant room. The system is designed to run continuously (24/7) to provide adequate ventilation to the refuse chute rooms. Upon detection of smoke within the 10th floor plant room the mechanical ventilation extract system will shut down. Intumescent blocks are installed in each individual extract grill located in the ductwork plenum behind each of the wall mounted grills to each of the bin chute rooms. The ducts are installed with fire dampers where they pass through the 10th floor slab and where they pass through any fire walls. The ductwork is installed in galvanised spiral ductwork from the 10th floor slab to each individual fan these then terminate to the external louvers installed in the side of the building The fire dampers are noted to be Lindab FD-C series circular fire dampers single blade and Lindab FD fire dampers multi blade drop.

New hopper doors have been installed by Dartford Metalcrafts, as part of the refurbishment, and are understood to provide a 4.5 hour fire rating to BS 476 Part 22:2005 with smoke containment to BS 476 Part 31.1:1983. Therefore, the arrangements for the refuse chutes/ refuse chute riser rooms are considered acceptable.

Figure 28 provides a photograph of the refuse chute room and extract system, with Figure 29 providing a photograph of the hopper door.

*Figure 28: Refuse room - hopper and extract*


*Figure 29: Hopper door label*

### 8.6 Ground Floor Refuse Stores

The refuse rooms are located at ground floor in Cores C & A with access provided directly from outside, via newly installed roller shutter doors. The refuse stores are provided with a fire detection and warning system and an 'auto-quench' fire suppression system. These components are supplied by Autoquench (AQ) Fire Protection systems (AQ2000), incorporating five AQ misting nozzles to protect one live bin and four additional stored bins, 2 optical smoke detectors and an external smoke alarm beacon (strobe light), cabling for the smoke detection system is provided by 22mm galvanised steel, for each store room. The AQ2000 system is a water mist system that is supplied directly from the main water supply without the need for tanks or a booster pump. Additionally, this system is to provide a 'wetting' cycle, set to dampen the bin contents every 6 hours.

The base of the chute is fitted with an automatic fire resisting shutter operated on a fixed temperature fusible link, supplied by Dartford Metalcrafts and are understood to provide a 3.5 hour fire rating to BS 476 Part 22. The system incorporates a galvanised auto cut-off slide and discharge chute complete with fusible link, control cables, pulleys and counterbalance weights. Whilst the fire resisting shutter will not provide any smoke containment, the arrangement is considered acceptable given the provision of the water mist system and automatic fire detection. The walls of riser room are of blockwork construction, with the floor slab of concrete construction and as such the refuse stores expected to meet the minimum requirement of 60 minute fire resisting construction.

The automatic fire detection in the bin store will be connected to the main fire alarm panel, which will ensure that a fire will not go undetected as the alarm signal will be passed to an alarm receiving centre.

No additional recommendations are made in respect of the refuse stores.

### 8.7 Lift Car Doors

One lift is located in each of the two central sections of protected corridor between the three residential areas. The lift serve all residential floor and also the Lower Ground level, with the lift motor rooms being on the 12$^{th}$ floor (accessed via the 11$^{th}$ floor plant room). There is currently no certification that can be provided for the lift doors to confirm whether the doors offer 30 mins fire resistance. Although this is the case, the lift access points are located in a protected corridor at residential levels, or with lobby protection at Lower Ground level. It can be assumed that fire loads are only present in areas – within the flats, or remote rooms in the LG level . There will be at least two fire doors between the lift doors and a fire load.

Therefore, taking into account the passive fire resisting structures, fire spread to the lift and subsequently smoke spread to other floors is thought to be extremely unlikely.

# 9. Internal Fire Spread

## 9.1 Internal Linings

In the early stages of a fire in a building, the choice of material for the lining of walls and ceilings can significantly affect the spread of fire and its rate of growth.

It is particularly important that in circulation spaces, where the rapid spread of fire is most likely to prevent occupants from escaping, the surface linings are restricted by making provision for them to have low rates of heat release and surface spread of flame.

All wall and ceiling linings within the building should meet the recommendations of the table below when tested under the European Classifications (in accordance with BS EN 13501-1:2002).

*Table 7: Classification of linings*

| Location | European Class |
|---|---|
| Small room of area not exceeding 4 $m^2$ in residential areas and 30 m2 in non-residential areas. | D-s3, d2 |
| Other rooms (including garages). | C-s3, d2 |
| Circulation spaces (including common areas of blocks of flats). | B-s3, d2 1 |
| Note 1: Wall coverings 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. | |

Parts of the wall area in rooms may be of poorer performance than specified above, but not worse than Class D-s3, d2. In any one room, the total area of lower performance wall lining should be less than an area equivalent to half of the room's floor area, up to a maximum of 20 m2 in residential and 60 $m^2$ in non-residential accommodation.

Internal escape routes should generally have wall and ceiling linings achieving a B-s3, d2 surface spread of flame standard, apart from permitted exceptions which may be noted elsewhere in this report.

These should be maintained for the lifecycle of the building, and manufacturer's guidelines should be followed with respect to maintenance and replacement of their products. Display features or items such as posters, artwork pieces, etc may be included with appropriate consideration through risk assessment, justification and on-going control.

Where thermoplastic materials are used (e.g., windows, rooflights and lighting diffusers only), these would comply with the recommendations given in Sections 4.13 – 4.17 of ADB Vol 1.

# 10. Structural Fire Resistance

Load bearing elements of structure are provided with fire resistance in order to prevent premature failure of the structure for three main reasons:

- to protect occupants of the building during a fire scenario (those escaping and also those remaining within flats unaffected by fire);
- to ensure a reasonably safe environment for fire fighters;
- to protect occupants in the surrounding areas of the building from falling debris or from the potential collapse onto adjacent buildings.

In the design of new buildings, the following construction elements in blocks of flats are typically afforded the fire resistance period of the structure:

- Structural frame, beams or columns (except elements only supporting a roof not forming a floor);
- Load-bearing walls;
- Compartment walls;
- External walls where protection against external fire spread is required;
- Floors (from the underside);
- Protected shafts (e.g. escape stairs, lift shafts, service risers, all spanning compartment floors).

Based on the building having a top occupied storey height of more than 18m and less than 30m, elements of structure should provide 60 minutes of fire resistance. This is provided that a sprinkler system is installed in accordance with BS EN 12845 or BS 9251.

## 10.1 Balconies

ADB recommends that balconies provided on a residential building with a storey 11m or more in height, the balconies should meet either of the following conditions:

a) Only contain materials achieving class A1 or A2-s1, d0, except for any of the following:

i. Cavity trays when used between two leaves of masonry.

ii. Intumescent and fire-stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1 to the Building Regulations 2010.

iii. Membranes.

iv. Seals, gaskets, fixings, sealants and backer rods.

v. Thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1 to the Building Regulations 2010.

vi. Any material achieving class A1fl or A2fl-s1 when it forms the top horizontal floor layer of a balcony and is provided with an imperforate substrate under it which extends to the full size of the class A1fl or A2fl-s1 material.

vii. Electrical installations.

viii. Fibre optic cables.

b) Achieve both of the following conditions:

i. Have an imperforate soffit which extends to the full area of the balcony, achieves a minimum REI 30 rating and is constructed of materials achieving class A2-s1, d0 or better.

ii. Materials achieving class B-s1, d0 or worse extending beyond the boundary of a single compartment should include a band of material rated class A2-s1, d0 or better, a minimum of 300mm in width centred on that boundary line.

ADB refers to BS 9991: 2024 and BS 8579: 2020 for further detail:

All balconies should:

a) not be composed of materials or designed such that they provide a medium for undue fire spread over the external envelope of the building;

b) not propagate fire downwards, e.g. not produce falling brands or flaming molten droplets or debris capable of initiating fire below;

c) be designed to minimize the risk of becoming detached from the face of the building and present a hazard to persons below, e.g. firefighters and the public; and

d) be designed to minimize the risk of prejudicing the stability of the building when undergoing large deformations resulting from fire exposure.

For enclosed balconies and enclosed terraces in buildings containing dwellings, the following apply:

1) The horizontal component separating one enclosed balcony from another in a separate fire compartment or from any other fire compartment is classed as a compartment floor which requires fire resistance from the underside.

   The balcony floors at Alfred Gunn are formed of an extension of the main floor slab which forms the compartment floor arrangement at each level.

2) The vertical component separating one enclosed balcony from an adjoining enclosed balcony in another fire compartment is classed as a fire compartment wall and requires fire resistance from both sides. In the case of an inset balcony adjoining the wall of another fire compartment or dwelling, the separating wall is also classed as a fire compartment wall. The fire-resistant separation between apartments/residences should extend to the extremities of the weather screen, i.e. be provided between the terraces/balconies of neighbouring dwellings, where these elements are continuous. However, this case is not found at Alfred Gunn House.

3) The continuity of the fire separating walls and fire separating floors should be maintained into the balcony. This can be achieved by fire stopping and should have fire resistance equal to the separating elements. This situation does not apply to the Alfred Gunn balconies.

Balconies which are enclosed, the definition of which is an area open to the outside of less than 50% of the total external facing area, are to be treated as a habitable compartment of the flat. This is true of the winter garden design of the Alfred Gunn balconies with this imposing a requirement on the means of escape, fire alarm provision and fire resistance.

The balconies are classed as a 'specified attachment' on the external envelope of the building and as such Regulation 7(2) applies to the elements of the balcony construction including glazing. The glazing to be used for the winter garden is constructed as part of an Alirail glass balustrade system with the glazing sitting within aluminium frames. This achieves the necessary level of fire rating of A2-s1,d0 provided that the 19mm glazing option is used. The additional steelwork added to the balconies for the winter garden construction is designed only for the increased wind load resulting from the new glazing and does not form part of the structural framework of the building. The balcony construction is formed of a cantilevered extension of the reinforced concrete floor slab. The soffits are of concrete construction with side railings of galvanised steel. The balconies meet the European Class A1 or A2-s1, d0 in accordance with EN 13501-1:2007 - A1:2009 providing the glazing option is correct.

### 10.1.1 Balcony Recommendations

The recommendations for travel distances, inner room arrangements and fire alarm provision that come with consideration of the winter gardens as habitable areas have previously been discussed in sections 5 and 6 of this report.

### 10.2 Steelwork in Stair A

Staircase A is a protected shaft, separated by lobbies/corridors from the flats by 60 min fire walls and due to its location near a lift and a dry riser provides the best means of access for firefighters into the building. The guidance requirement for escape stair design states that the construction of a protected stair is limited to utilisation of materials of limited combustibility without any further recommendations for a fire resisting standard. In terms of structural fire resistance, a stair is not ordinarily defined as a structural element of a building. For these reasons, there are no specific recommendations about the fire resistance of the stair.

All fire escape stairs are expected to be absent of any fire load in order to remain compliant with the Regulatory Reform (Fire Safety) Order 2005 [1]. However, it is recognised that within residential buildings, the escape routes are not always maintained as fire sterile areas by the residents and there will be instances where a fire load can build up inside a stairwell, for example some discarded furniture awaiting collection, an e-scooter and such like.

Given the potential for such fire loads then the possibility exists of a fire which could cause damage to the steelwork in the stairwell. It is suggested that a robust fire safety management regime will alleviate this issue to a degree through the use of regular walkdowns and rubbish removal. However, this will not always guarantee fully sterile communal areas. However, the three stairs which serve the building, which are available at all resident levels and separated by fire rated construction and fire doors such that they can be regarded as being independent from each other, will ensure that even should one stair be compromised then residents would be able to make their way out of the building by another route should they choose to do so.

# 11. External Fire Spread

## 11.1 External Wall Construction

Part of the refurbishment has included installing a new cladding system. A review of the fire performance of this system is not part of the scope of this report (as discussed previously with SMBC) and are not considered here. It is assumed that this review will be completed elsewhere by others. Nonetheless, a full description of the cladding and how it purports to meet the current standards can be found in separate documentation provided by the responsible party.

## 11.2 Building Separation

The refurbishment and building work carried out did not alter the internal fire compartmentation, nor did it affect the nature of the internal fire load. Therefore, there is no requirement to re-assess the building for separation from adjacent buildings.

## 11.3 Roof Covering

The relevant test and classifications for the external fire performance of roof systems is BS EN 13501-5.

Roof coverings refer to a construction that can consist of one or more layers of materials but does not refer to the roof structure.

The roof covering fire performance requirements are as per the table below. As the closest point of Alfred Gunn House is less than 14 m from the site boundary, the roof covering should be at leat class CROOF(t4).

*Table 8: Roof covering requirements*

| Designation of Covering of Roof or Part of Roof | Distance From any Point of Relevant Boundary | | | |
|---|---|---|---|---|
| | Less than 6 m | At least 6 m | At least 12 m | At least 20 m |
| $B_{ROOF}(t4)$ | Acceptable | Acceptable | Acceptable | Acceptable |
| $C_{ROOF}(t4)$ | Not Acceptable | Acceptable | Acceptable | Acceptable |
| $D_{ROOF}(t4)$ | Not Acceptable | Not Acceptable | Not Acceptable | Acceptable |
| $E_{ROOF}(t4)$ | Not Acceptable | Not Acceptable | Not Acceptable | Not Acceptable |
| $F_{ROOF}(t4)$ | Not Acceptable | Not Acceptable | Not Acceptable | Not Acceptable |

# 12. Access and Facilities for the Fire and Rescue Service

## 12.1 Vehicle Access

*The fire vehicle access to the building will be available at the front of the building via the existing public roadways. The access routes for the pump fire vehicle should be in line with the recommendations in*

Table 9

*The pump fire vehicle should be able to stop within 18 m and in sight of the dry fire main inlet located adjacent to the entrance to the building.*

*Table 9: Fire vehicle access route design*

| Minimum Access Route Specification | Dimension |
|---|---|
| Width between kerbs | 3.7 m |
| Width between gateways | 3.1 m |
| Turning circle between kerbs | 16.8 m |
| Turning circle between walls | 19.2 m |
| Clearance height | 3.7 m |
| Carrying capacity | 14 tonnes |
| Maximum Reversing Distance | 20.0 m |

## 12.2 Hydrant Provision

The figure below shows the locations of known hydrants nearby. There are two private hydrants on site immediately adjacent to AGH, and two public hydrants approximately 120m away. The closest private hydrants should be checked to ensure that they can provide a sufficient flow of water for firefighting purposes, with the guidance within BS 9990 of 8l/sec recommended as a minimum thought appropriate.

**Recommendation 10: It is recommended that the site hydrants are tested for flow. BS 9990 guidance is for a flow rate of 8l/sec which is a recommended minimum.**


*Figure 30: Hydrant locations*

## 12.3 Access into the Building

There is currently a non-standard arrangement for firefighting access within the building. Current expectations for a residential building of this height would be to have a firefighting shaft, comprising a firefighting stair, firefighting lobby, firefighting lift and dry riser. The firefighting shaft would be within an enclosure offering 120 minutes of fire resistance. However, given the existing nature of the structure it has not been possible to remediate any of these issues fully. However, firefighter access has been improved significantly with the addition of a new central stair which will provide closer proximity to a lift in order to reach the upper floors and reduce hose laying distances. Wayfinding signage is also to be installed.

Lift access in tall building is essential for fire service operations where the use of stairs would cause delay in getting personnel and equipment in position. Whilst Alfred Gunn has lifts, none of these provide firefighting lift provision. Such lifts would normally include: the lift shaft being located inside the firefighting shaft; a back-up power supply; and measures in place to prevent water ingress to the lift shaft, amongst other requirements. Additionally, the door of such a lift would be within 7.5m of the head of the firefighting stair. Only the lift for the central core achieves this latter requirement. The lifts in Alfred Gunn are of a type that can be classified as a 'Fireman's Lift', this being the standard installed prior to the 1980s. In this case the requirements for a firefighting lift as stated above are often absent and the only necessity is for a 'fireman's switch' to override the normal manual controls. As the lifts are existing and given the age of the building, then they are deemed to be adequate in their current form, but it is emphasised that they do not meet modern standards. The functionality of the firefighter override should be confirmed however.

**Recommendation 11: Ensure that the lifts provide the functionality of a 'fireman's override' switch to enable attending fire service personnel to take control of the lifts for operational purposes.**

The requirement for all areas of the building to be reached within 60m of hose laying distance is achieved for the residential floors. However, this is only on the provision that the dry riser located in the central core is used.

The 60m hose laying distance would be exceeded should firefighting be required at the extremities of the 11th floor corridors . However, the fire load across the 11th floor is thought to be low and no recommendation is made here for remediation.

## 12.4 Building Evacuation Alarm

The refurbishment of the building began prior to the enactment of the Fire Safety (England) Regulations 2022 which would have stipulated the installation of a Building Evacuation Alarm. Whilst not a strict requirement, it is advised that installation of such a system would be best practice given the height of the building and interconnecting Cores. In the event of unwarranted fire or smoke spread in the building it would allow the fire service to evacuate specific floors of the building more quickly. However, it is noted that there are limited travel distances and 4 flats per corridor, in each Core, with a slight reduction at the 10th floor due to the plant room. On this basis and given the provision of the sprinkler system to the flats, it is considered reasonably practicable for the fire and rescue service to utilise traditional methods of floor-by-floor evacuation. Therefore, no recommendations are raised in this regard.

## 12.5 Wayfinding Signage

To assist the Fire and Rescue Service with identifying each floor in a block of flats with a top storey more than 11 m above ground level, floor identification signs and flat indicator signs should now be provided. The floor identification signs should meet all of the following conditions.

i. The signs should be located on every landing of a protected stairway and every protected corridor / lobby (or open access balcony) into which a firefighting lift opens.
ii. The text should be in sans serif typeface with a letter height of at least 50 mm. The height of the numeral that designates the floor number should be at least 75 mm.
iii. The signs should be visible from the top step of a firefighting stair and, where possible, from inside a firefighting lift when the lift car doors open.
iv. The signs should be mounted between 1.7 m and 2 m above floor level and, as far as practicable, all the signs should be mounted at the same height.
v. The text should be on a contrasting background, easily legible, and readable in low-level lighting conditions or when illuminated with a torch.

The wording used on each floor identification sign should take the form, Floor X, with X designating the number of the storey, as intended for reference by residents. The floor number designations should meet all of the following conditions:

i. The floor closest to the mean ground level (see Diagram D4) should be designated as either Floor 0 or Ground Floor.
ii. Each floor above the ground floor should be numbered sequentially beginning with Floor 1.
iii. A lower ground floor should be designated as either Floor 1 or Lower Ground Floor.
iv. Each floor below the ground floor should be numbered sequentially beginning with Floor 1 or Basement 1.

All floor identification signs should be supplemented by flat indicator signs, which provide information relating to the flats accessed on each storey. The flat indicator signs should meet all of the following conditions:

i. The signs should be sited immediately below the floor identification signs, such that the top edge of the sign is no more than 50 mm below the bottom edge of the floor identification sign.
ii. The wording should take the form Flats X–Y, with the lowest flat number first.
iii. The text should be in sans serif typeface with a letter height of at least half that of the floor indicator sign.
iv. The wording should be supplemented by arrows when flats are in more than one direction.
v. The text and arrows should be on a contrasting background, easily legible, and readable in low-level lighting conditions or when illuminated with a torch.

Note: In the case of multi-storey flats with two or more entrances, the flat number should only be indicated on the normal access storey.

**Recommendation 12: Wayfinding signage should be installed as per the guidance within ADB.**

## 12.6 Secure Information Box

Blocks of flats with a top storey more than 11 m above ground level should be provided with a secure information box. A secure information box is used to store building information for use by the fire service during emergencies.

The box should be sized to accommodate all necessary information, easily located and identified by firefighters, and secured to resist unauthorised access but readily accessible by firefighters. Best practice guidance can be found in the Code of Practice for the Provision of Premises Information Boxes in Residential Buildings published by the Fire Industry Association (FIA).

## 13. Fire Safety Management

To be able to demonstrate in broad terms that all structures, systems and components should be designed, constructed, commissioned, operated and maintained in such a way as to enable duty holders of the building to manage the risk and provision of fire service access and water supply, a Fire Statement document sets out to achieve the following principles:

1. Demonstrate that the building conforms to relevant building regulations and planning legislation and applies proportionate good engineering practices and sound risk management principles.
2. Identify the failure modes and potential hazards with respect to fire service access and water supply.
3. Provide sufficient information (golden thread) that demonstrates that any measures have been applied in an appropriate manner and at the first Gateway.

Inherent in fire strategy is the assumption that there will be appropriate fire safety management of the premises when in use. In accordance with BS 9999:2017, there are two management system levels, enhanced and adequate. Enhanced demonstrates a high level of assurance with a PAS 7 standard of management level. Adequate level of management demonstrates assurance which conforms with the requirements of the legislation.

Management of fire safety must be integrated with all other management systems. To ensure there is no doubt as to where the responsibility for fire safety rests, and to enable consistency of approach, it is important that each establishment appoints a designated fire safety representative who reports to the nominated Building Safety Manager.

The appointed person should have the necessary authority and powers of sanction to ensure that standards of fire safety are maintained. The main duties of the Fire Safety Manager are as listed in BS 9999:2017, include:

1. Managing the building to minimise the incidence of fire (fire prevention), e.g., good fire safe housekeeping and security.
2. Producing an Emergency Fire Plan.
3. Being aware of all the fire safety features provided and their purpose.
4. Being aware of any particular fire risks on the premises, plus those relating to construction materials.
5. Being aware of their responsibilities towards occupants who may require assistance during any evacuation.
6. Liaising with, and where necessary seek the advice of, the fire authority, the licensing authority and other relevant enforcing authorities.
7. Having powers to deal with individuals who damage or tamper with fire safety systems, who ignore any smoking policy or who block exits.
8. Liaising with other fire safety managers in a multi-occupancy arrangement.
9. Ensuring that public areas are suitably controlled.
10. Ensuring that tenants, concessionaires, or caretakers are appropriately briefed as to the fire procedures for the building.
11. Ensuring that all necessary and appropriate communication systems are in place to deal with any fire incident.
12. Checking the adequacy of any firefighting equipment and ensuring its regular maintenance.
13. Ensuring fire escape routes and fire exit doors / passageways are kept unobstructed and doors operate correctly.
14. Ensuring that fire detection and protection systems are maintained and tested, and proper records are kept; and
15. Ensuring any close-down procedures are followed.

Good fire-safe housekeeping will be encouraged to ensure that the effectiveness of the fire safety provisions is not adversely affected. This should include adequate provision for the disposal of waste and / or rubbish.

Where appropriate, these facilities should be emptied on a daily basis and the rubbish stored in a suitable area outside the building. Maintenance procedures should be developed to ensure that all equipment and services are able to operate effectively. Maintenance staff should be trained in the importance of the fire safety systems and planned maintenance programmes developed.

The management of ancillary accommodation will need to develop procedures to assist with the evacuation of vulnerable persons and should not rely on the fire and rescue service for assistance.

Suitable assembly points outside the building should be identified. These should be remote from the access routes used by the attending Fire Services.

Maintenance procedures will be developed to ensure that all equipment and services are able to operate effectively. Maintenance staff will be trained in the importance of the fire safety systems and planned maintenance programmes developed.

Where installed, fire points for fire extinguishers should be located at storey exits to ensure that coverage of at least one fire point containing a Water type and Carbon Dioxide type fire extinguisher for every 200m2 of floor area. The type and size of fire extinguisher(s) at each fire point should be selected in accordance with BS 5306 guidance.

The Fire Safety (England) Regulations 2022 are the recent regulations that came into force on 23 January 2023. The regulations describe the responsibilities of the Responsible Person, as defined under Regulatory Reform (Fire Safety) Order in relation to fire safety within the buildings that contain two or more domestic premises (including the residential parts of mixed-use buildings).

For Alfred Gunn House, as it is not defined as a "high-rise residential building" and has a top floor less than 11m in height. These are as follows:

The responsible person must display fire safety instructions in a conspicuous part of the building, that are in a form that the residents can understand and include all of the following:

- Instructions relating to the evacuation strategy for the building (e.g. defend in place).
- Instructions as regards how to report a fire to the fire and rescue authority.
- Any other instruction that tells residents what they must do when a fire has occurred.

The responsible person must provide a copy of the instructions to a new resident of domestic premises within the building, as soon as reasonably practicable after that resident moves into the premises.

The responsible person must provide the required information about fire doors to the residents of the building. The required information is to the effect that:

- Fire doors should be kept shut when not in use.
- Residents or their guests should not tamper with the self-closing devices.

Residents should report any faults or damages with doors immediately to the responsible person.

## 14. Conclusion

The documents in Table 3 have been used in the production of this report. If there is any additional information available which should be considered or may have an impact on this report, RPS should be informed and provided with this information, as it may have a bearing on the conclusion of this report.

Through a combination of the guidance recommendations and fire engineering approach, a solution is provided which is adequate to address the risk, therefore evidencing compliance with the functional requirements of Part B of the Building Regulations and providing the basis for a building safety case.

This report is to be agreed with Building Control Body, in consultation with the local Fire & Rescue Service.

The engineered solutions presented within this report are a deviation from accepted guidance and represent an approvals risk, as such these should not be relied upon for design until approved by the Statutory Authorities.

*Table 10: Summary of recommendations*

| Number | Recommendation |
|---|---|
| 1 | Ensure a fire strategy drawing for the lower ground, showing the location of smoke detection, evacuation routes, sprinkler tanks, emergency lighting etc. is available. |
| 2 | When the building is occupied SMBC Fire Safety teams should undertake Personal Emergency Evacuation Plans (PEEPs) for occupants that would be considered to have additional fire safety needs, such as, hard of hearing and non-ambulant persons. |
| 3 | Ensure that any device that isolates the power to the smoke alarms is labelled "CAUTION. SMOKE ALARMS CONNECTED TO THIS CIRCUIT. DO NOT SWITCH OFF". |
| 4 | Recommendation 4: Ensure that the interfaces listed below are incorporated into the landlord's fire detection and warning system:<br>1. Ensure the lifts descend to ground floor upon activation of a smoke detector head within the protected corridors.<br>2. Ensure that the lower ground floor fire detection and warning, including that installed in the refuse bin store rooms, is connected to an Alarm Receiving Centre (ARC) to ensure early warning and intervention.<br>3. The plant room (roof level) is connected to an ARC<br>4. The VESDA system within the ceiling void of the 10th floor flats is connected to an ARC. |
| 5 | Test the smoke alarm audibility within the flats, to ensure that they can be heard on the balcony with the door in the closed position, with a recommended sound pressure of 65dB. If this level is not achieved, or persons that are hard of hearing (PEEP users) would be unable to hear the alarm, then a visual/ audible device connected to the alarm system should be installed within the balconies. |
| 6 | Confirm if the front and rear of elevations areas of the building are provided with functioning emergency lighting to a sufficient standard; if emergency lighting is not provided in these areas it should be installed in line with the requirements of BS 5266-1. |
| 7 | Provide a deployable ladder and a readily openable hatch in each lift motor room to provide an alternative means of escape that doesn't require passing through the plant room. |
| 8 | With regards to BS7671, 17th Edition, Amendment 3, the electrical cabling within the lower ground floor should be provided with fire resistant fastenings and fixings which resist premature collapse in fire conditions. It is recommended that horizontal cabling (overhead) should be secured at maximum 300mm spacings, with vertical cabling (wall) secured at 500mm. |
| 9 | Those penetrations which are missing fire stopping, or which have inadequate fire stopping should have remediation work carried out in order to bring them up to an adequate standard. |
| 10 | The site hydrants should be tested for flow. BS 9990 guidance is for a flow rate of 8l/sec which is a recommended minimum. |
| 11 | Ensure that the lifts provide the functionality of a 'fireman's override' switch to enable attending fire service personnel to take control of the lifts for operational purposes. |
| 12 | Wayfinding signage should be installed as per the guidance within ADB. |

## 15. References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## Appendix A: Regulation 38 Information

Figure A.1. Flat 1: Certification of Fire Detection and Warning (LD2)

2H GROUP

**CERTIFICATE OF DESIGN, INSTALLATION AND COMMISSIONING OF FIRE DETECTION AND FIRE ALARM SYSTEMS OF GRADE C, GRADE D AND GRADE F SYSTEMS**

Certificate Number: E3130-FA-FLAT-1

**1 DETAILS OF THE CLIENT**

Client and address: Sedoons Construction, Suite 3-4 Alexander House , Water Egde Business Park, Stoke on Trent, ST4 4DB

**2 DETAILS OF THE FIRE DETECTION SYSTEM**

Installation Address: Flat-1, Alfred Gunn House , Thompson Road , Oldbury, B68 8RW

Extent of the fire detection and alarm system covered by this certificate: Smoke detectors fitted to hallway and lounge. Heat detector fitted to kitchen.

The installation is: New ✔ An addition N/A An alteration N/A

**3 DESCRIPTION OF SYSTEM GRADE AND SYSTEM CATEGORY**

System Grade: C N/A D1 ✔ D2 N/A F1 N/A F2 N/A

System Category: LD1 N/A LD2 ✔ LD3 N/A PD1 N/A PD2 N/A

**4 COMMISSIONING**

| | | | | | |
|---|---|---|---|---|---|
| Test buttons checked | ✔ | Simulated smoke or aerosol test | ✔ | Dedicated circuit(s) provided | N/A |
| All alarm warning devices operate | ✔ | Heat test | ✔ | Protected device labelled | ✔ |
| Silencing system checked | ✔ | Bedroom sound level (Clause 13.2) | ✔ | Audible and visual indication of mains failure | ✔ |

Sound level test instrument model and serial No: ACT1345

Serial No. of associated Electrical Installation or Minor Works Cert: E3130-Flat-1

**5 USER INSTRUCTIONS**

I/We the undersigned declare that the occupier of the dwelling (or owner in the case of a house in multiple occupancy) has been provided with written information about essential aspects of the operation and maintenance of the system, as follows:

| | | | |
|---|---|---|---|
| Operation of the system | ✔ | The need to keep clear space around all detectors and manual call points | ✔ |
| Action to be taken in the event of a fire alarm signal | ✔ | Special precautions relevant to any lithium batteries used in the system | ✔ |
| Avoidance of false alarms and action in the event of a false alarm | ✔ | Checking the system on reoccupation of the dwelling after a vacation etc. | ✔ |
| Warning that apparent false alarm from carbon monoxide detector may not be false alarm | ✔ | The need to avoid contamination of detectors by paint | ✔ |
| Routine testing of the system | ✔ | As-fitted drawing | ✔ |
| Servicing and maintenance of the system (including intervals at which any batteries should be replaced) | ✔ | | |

**6 CERTIFICATE OF DESIGN, INSTALLATION AND COMMISSIONING**

I/We, being the person(s) responsible (as indicated by my/our signature(s) below), for the design, installation, and commissioning of the fire alarm system, particulars of which are set out above, CERTIFY that the said work for which I/we have been responsible complies to the best of my/our knowledge and belief with the recommendations of BS 5839-6:2019 for the system described above, except for the variations, if any, stated below:

Variations (if any):

The extent of liability of the signatory is limited to the work described above as the subject of this certificate.

**For the DESIGN, INSTALLATION AND COMMISSIONING of the system:**

Name: Dan Humphries Position: PDH Signature: Date: 30/01/2025

**7 DETAILS OF THE ELECTRICAL CONTRACTOR**

Trading Title: 2H Group Ltd

Address: Unit 35, Elenora Street, Stoke on Trent

Postcode: ST4 1QD

Registration Number (if applicable): 606421

Telephone Number:

**Note: This certificate may be required by an authority responsible for enforcement of fire safety legislation, such as building control authority or housing authority. The recipient of this certificate might rely on the certificate as evidence of compliance with legislation. Liability could arise on the part of any organisation or person that issues a certificate without due care in ensuring its validity.**

Figure A.2. Flat 130: Certification of Fire Detection and Warning (LD1)

2H GROUP

**CERTIFICATE OF DESIGN, INSTALLATION AND COMMISSIONING OF FIRE DETECTION AND FIRE ALARM SYSTEMS OF GRADE C, GRADE D AND GRADE F SYSTEMS**

Certificate Number: E3130-FA-FLAT-130

**1 DETAILS OF THE CLIENT**

Client and address: Sedoons Construction, Suite 3-4 Alexander House , Water Egde Business Park, Stoke on Trent, ST4 4DB

**2 DETAILS OF THE FIRE DETECTION SYSTEM**

Installation Address: Flat-130, Alfred Gunn House , Thompson Road , Oldbury, B68 8RW

Extent of the fire detection and alarm system covered by this certificate: Smoke detectors fitted to hallway, lounge and bedrooms. Heat detector fitted to kitchen.

The installation is: New ✔ An addition N/A An alteration N/A

**3 DESCRIPTION OF SYSTEM GRADE AND SYSTEM CATEGORY**

System Grade: C N/A D1 ✔ D2 N/A F1 N/A F2 N/A

System Category: LD1 ✔ LD2 N/A LD3 N/A PD1 N/A PD2 N/A

**4 COMMISSIONING**

| | | | | | |
|---|---|---|---|---|---|
| Test buttons checked | ✔ | Simulated smoke or aerosol test | ✔ | Dedicated circuit(s) provided | N/A |
| All alarm warning devices operate | ✔ | Heat test | ✔ | Protected device labelled | ✔ |
| Silencing system checked | ✔ | Bedroom sound level (Clause 13.2) | ✔ | Audible and visual indication of mains failure | ✔ |

Sound level test instrument model and serial No: ACT1345

Serial No. of associated Electrical Installation or Minor Works Cert: E3130-Flat-130

**5 USER INSTRUCTIONS**

I/We the undersigned declare that the occupier of the dwelling (or owner in the case of a house in multiple occupancy) has been provided with written information about essential aspects of the operation and maintenance of the system, as follows:

| | | | |
|---|---|---|---|
| Operation of the system | ✔ | The need to keep clear space around all detectors and manual call points | ✔ |
| Action to be taken in the event of a fire alarm signal | ✔ | Special precautions relevant to any lithium batteries used in the system | ✔ |
| Avoidance of false alarms and action in the event of a false alarm | ✔ | Checking the system on reoccupation of the dwelling after a vacation etc. | ✔ |
| Warning that apparent false alarm from carbon monoxide detector may not be false alarm | ✔ | The need to avoid contamination of detectors by paint | ✔ |
| Routine testing of the system | ✔ | As-fitted drawing | ✔ |
| Servicing and maintenance of the system (including intervals at which any batteries should be replaced) | ✔ | | |

**6 CERTIFICATE OF DESIGN, INSTALLATION AND COMMISSIONING**

I/We, being the person(s) responsible (as indicated by my/our signature(s) below), for the design, installation, and commissioning of the fire alarm system, particulars of which are set out above, CERTIFY that the said work for which I/we have been responsible complies to the best of my/our knowledge and belief with the recommendations of BS 5839-6:2019 for the system described above, except for the variations, if any, stated below:

Variations (if any):

The extent of liability of the signatory is limited to the work described above as the subject of this certificate.

**For the DESIGN, INSTALLATION AND COMMISSIONING of the system:**

Name: Luke Coates Position: Electrician Signature: Date: 03/12/2024

**7 DETAILS OF THE ELECTRICAL CONTRACTOR**

Trading Title: 2H Group Ltd

Address: Unit 35, Elenora Street, Stoke on Trent

Postcode: ST4 1QD

Registration Number (if applicable): 606421

Telephone Number:

**Note: This certificate may be required by an authority responsible for enforcement of fire safety legislation, such as building control authority or housing authority. The recipient of this certificate might rely on the certificate as evidence of compliance with legislation. Liability could arise on the part of any organisation or person that issues a certificate without due care in ensuring its validity.**

## Appendix B: Fire Detection and Warning: Cause and Effect

**Landlords System: Alfred Gunn - Cores C, A, B**

| CAUSE \ EFFECT | Signal to Main Fire Alarm Panel | Signal to Remote Monitoring Facility | Lift to Ground Floor | Activate smoke vent zone 1 | Activate smoke vent zone 2 | Activate smoke vent zone 3 | Activate smoke vent zone 4 | Activate smoke vent zone 5 | Activate smoke vent zone 6 | Activate smoke vent zone 7 | Activate smoke vent zone 8 | Activate smoke vent zone 9 | Activate smoke vent zone 10 | Activate smoke vent zone 11 | Stairwell Automatic Opening Vent (AOV) open | Shut down mechanical ventilation extract system |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mains Failure | X | X | X | | | | | | | | | | | | | |
| Panel Fault/ System Fault | X | X | | | | | | | | | | | | | | |
| Weekly Test | X | | | | | | | | | | | | | | | |
| Annual Test | X | X | | | | | | | | | | | | | | |
| Any Smoke Detector in Zone 0 Lower Ground Floor (Landlord's Area, including bin store rooms) | X | X | X | | | | | | | | | | | | | |
| Any Smoke Detector in Zone 1 GF Corridor | X | X | X | X | | | | | | | | | | | X | |
| Any Smoke Detector in Zone 2 First Floor Corridor | X | X | X | | X | | | | | | | | | | X | |
| Any Smoke Detector in Zone 3 Second Floor Corridor | X | X | X | | | X | | | | | | | | | X | |
| Any Smoke Detector in Zone 4 Third Floor Corridor | X | X | X | | | | X | | | | | | | | X | |
| Any Smoke Detector in Zone 5 Fourth Floor Corridor | X | X | X | | | | | X | | | | | | | X | |
| Any Smoke Detector in Zone 6 Fifth Floor Corridor | X | X | X | | | | | | X | | | | | | X | |
| Any Smoke Detector in Zone 7 Sixth Floor Corridor | X | X | X | | | | | | | X | | | | | X | |
| Any Smoke Detector in Zone 8 Seventh Floor Corridor | X | X | X | | | | | | | | X | | | | X | |
| Any Smoke Detector in Zone 9 Eighth Floor Corridor | X | X | X | | | | | | | | | X | | | X | |
| Any Smoke Detector in Zone 10 Ninth Floor Corridor | X | X | X | | | | | | | | | | X | | X | |
| Any Smoke Detector in Zone 11 Tenth Floor | X | X | X | | | | | | | | | | | X | X | X |
| Any Smoke Detector in Zone 12 Tenth Floor Plant Room | X | X | X | | | | | | | | | | | | X | X |
| VESDA System to Roof Void (Zone 13?) | X | X | | | | | | | | | | | | | | |
| Activation of sprinkler fire suppression anywhere within building* | X | X | | | | | | | | | | | | | | |
| *Should be taken as a signal of a confirmed fire by the ARC | | | | | | | | | | | | | | | | |

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