

FIRE ENGINEERING

Fire Risk Appraisal for External Walls (FRAEW) According to PAS9980:2022

Agecroft House, Manchester



Ref: OF00178
Client: Scanlans Property Consultants
Version: 01
Status: ISSUE

Date: 25-02-2025

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REPORT DETAIL

Project	Agecroft House - Manchester
Address	34 Copperas Street, Manchester, M4 1HQ
Document	Fire Risk Appraisal for External Walls (FRAEW) According to PAS9980:2022
Version	01

Report Version History

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Version		Status	Date Issued
FRAEW Report	01	DRAFT	21.02.2025
FRAEW Report	01	ISSUE	25.02.2025

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STATEMENT OF COMPETENCE

I can confirm that I have:

- read and understood the commentary and provisions relating to the competence of external wall assessors set out in Section 8 and Annex H of PAS9980:2022;
- an adequate and relevant competence to undertake the FRAEW;
- sufficient knowledge, skills and experience in relation to fire safety of external walls to be able to complete an assessment at the level required;
- the relevant skill, knowledge and experience to manage and interpret the results of intrusive inspections;
- the competence to appraise and assess the nature of external wall construction in terms of fire performance and provide an opinion on the risk;
- knowledge to undertake this Basic Level Assessment to produce the FRAEW as required by the PAS9980:2022;
- relevant professional experience in conducting similar investigations;
- a fully qualified membership of a relevant professional body as stated below;
- no conflicts of interest of any kind, other than any which are disclosed in the report;
- reached the report conclusions which are the author's independent assessment of the risks and remedial actions and;
- not been influenced in any way by the opinions or actions of others except where stated.

It is confirmed that Octa Fire carries an appropriate level of professional Indemnity Insurance to undertake this FRAEW.

After our investigations and assessment, should it be concluded that a further in-depth technical assessment is required, the report and findings will be required to be verified by a Chartered Engineer along with further technical assessment, using fire engineering analysis, as per PAS9980:2022 Clause 14.

ENGINEERS PROFILE

Author of the Report	Mohammad Asif Irfan - BEng (Hons) Chem Eng, PGCert, AIFireE, MIFSM, MSFPE, CFPA Europe CERT
Engineers Profile	<p>Highly experienced in the field of fire safety engineering, including working with leading manufacturers of chemically synthesised building products readily used across building sites, such as for external wall systems and roofs. Mohammad has also been involved with conducting both large and small scale product/system fire testing for various clients with accredited test labs across UK and Europe.</p> <p>Mohammad has a wealth of fire engineering knowledge amassed from an Undergraduate Honours degree in Chemical Engineering and further 2 years assessed post grad qualification in Fire and Explosion Engineering at the University of Leeds. This, coupled with 8 years of fire engineering experience, has allowed Mohammad to gain a deeper understanding of fire science and provide a wide range of fire engineered solutions on complex buildings across the board. He also spends time working with the latest technical developments with building products so that knowledge can be appropriately applied to producing safe and robust solutions.</p>

Reviewer of the Report	Dr. Harem Hussein – BSc, MSc, CEng, MIFireE, MIMechE, PMSFPE
Engineers Profile	<p>Harem has over 12 years of experience in fire safety engineering nationally and internationally, and PhD in fire safety engineering. Harem is a Chartered Engineer with the Engineering Council through both the Institute of Fire Engineering (IFE) and the Institute of Mechanical Engineering (IMechE) as well as a Professional Member of the Society of Fire Protection Engineers (SFPE). Harem is familiar with the UK building regulations, codes and standards regarding fire safety. He was involved in developing many fire strategy reports for existing and new buildings and is well familiar with finding a robust fire engineering solution for complex buildings. He has authored and a peer reviewed many fire engineering reports and technical notes.</p> <p>Harem is actively working on investigating external walls for existing high-rise residential buildings according to the PAS9980 methodology and advises clients on a daily basis regarding their building external walls' safety and any necessary remedial works based on the FRAEW reports' outcomes. Harem is now working on various fire engineering and fire safety research projects to ensure a safer built environment for all.</p>

1.0 EXECUTIVE SUMMARY

Octa Fire has been appointed by Scanlans Property Consultants (*'the Client'*) to produce a Fire Risk Appraisal for External Walls (FRAEW) according to PAS9980:2022 for Agecroft House (*'the building'*), which is situated on 34 Copperas Street, Manchester M4 1HQ.

The building has a multi-occupancy purpose, with a combination of commercial and residential units. The development comprises of 6 storeys (ground plus 5), 2nd to 5th floors consist of apartments, 29 units overall. The 1st floor consists of a landing and the lift. The ground floor consists of an entrance foyer from the street with access to the stair that serves the upper floors and the lift, there is access to the bin room and the electrical room from this foyer. There is no access to the basement, this is used by the commercial occupier on the ground floor.

The building fire safety height (i.e., last habitable floor level) is informed to be less than 18m (approx. 12.423m [11]).

Based on the information provided, it is best understood that the building was completed in 2006. Therefore, the building is likely to have followed guidance contained within Approved Document B, 2000 incorporating 2002 amendments (referred to as ADB 2000 herein), and the relevant British Standards to comply with the UK Building (Amended) Regulation 2000.

2No. intrusive site inspections were conducted by the Octa Fire's Fire Engineering team on the 25th & 26th of November 2024.

It has to be noted that Octa Fire have performed this FRAEW report based on the information provided by the client (which includes reports produced by others, such as FPS (Fire Protection Service NW Ltd) and Watts (see Table 1 in section 5.0 for further details)). Information about the buildings fire safety provisions (as produced and supplied by others) have only been reviewed by Octa Fire for the purpose of the FRAEW report's holistic approach.

It is informed that there are six external wall types installed on the building; these have been listed as follows:

- **EWT1** – Traditional Brick Facade;
- **EWT2** – Grey/Blue Terracotta Tiles;
- **EWT3** – Grey Metal Cladding Panel;
- **EWT4** – Silver ACM Cladding Panel;
- **EWT5** – Grey Insulated Window Cladding Panel; and
- **EWT6** – Curtain Walling.

EWT1 comprises of masonry facing brick façade, which covers majority of the building envelope and has been installed from ground to 4th floor of the building on all elevations. It is best understood that EWT1 solely consists of non-combustible materials (A1) within its build-up (brick and blockwork with mineral/glass wool insulation) with the exception of the thin EPDM membrane (which was only found at the inspected horizontal floor slab level), given the low combustible mass of the external wall materials within this wall type, it is our view that this will significantly reduce the risk of fire spread up and across the building envelope. With regards to cavity barrier provisions within EWT1, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas (i.e., compartment lines, window openings and vent penetration). However, given that EWT1 is believed to comply with all the parameters put forward within Diagram 8.2 of the current ADB and Diagram 32 of the old ADB, (i.e., two leaves of brick or concrete assuming each at least 75mm thick, cavities are closed around opening to limit air infiltration and the cavity at the top of the external wall is also closed off), based on this, it can be concluded that cavity barriers are not required for this external wall system and the likelihood of fire spreading through this façade system is low. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT1 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

EWT2 comprises of grey and blue coloured terracotta tiles, which have been installed from ground - 4th floor level on front, right side and rear elevations of the building. It is best understood that EWT2 primarily comprises of A1 non-combustible materials (outer terracotta tiles and blockwork substrate with mineral wool insulation), with the exception of the thin breather membrane, given the low combustible mass of the external wall materials within this wall type, it is our view that this will significantly reduce the risk of fire spread up and across the building envelope. With regards to

cavity barrier provisions within EWT2, no proprietary mineral wool-based cavity barriers were observed at any of the inspected locations (i.e., window openings and compartment lines). In-addition to this, whilst inspecting EWT2, horizontal steel structures were observed on the building façade at the floor slab levels, which creates a divide between the terracotta system, and also present vertically, which is understood to create a divide between EWT2 and EWT1. The paint applied on the steel structure (unclear if it is intumescent or not) was observed to be peeling off. It should be noted that if the horizontal and vertical steel works (as noted on site) are considered primary structural, loadbearing elements of the building, then they are required to be adequately fire protected to uphold the same level of fire resistance as the element of structure for the building. Review of structural fire performance of the building is currently excluded from our FRAEW scope of works. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT2 to harm the building occupants is **MEDIUM** and tolerable, hence in our opinion, remedial action is not needed to this wall system.

EWT3 comprises of a grey coloured metal cladding panel (ferrous), which is believed to be installed to a limited area of the building envelope from 1st - 4th floor level (on concrete/blockwork substrate and divided by windows) on front, right and rear elevations of the building. Wall build-up for EWT3 is understood to comprise of grey coloured PPC coated metal cladding panel (ferrous), followed by a thin layer of Sarnafil membrane (which is understood to be a waterproofing membrane with a Euroclass E reaction to fire classification), applied to a metal sheet (ferrous). EWT3 is installed directly back to the concrete/blockwork substrate in the absence of a cavity void. In addition to this, it should be noted that EWT3 steps back from the main body of the façade and the adjacent wall types are either EWT1 (brick), EWT2 (terracotta tiles) or vertical steel columns. Based on this, it can be said that the risk of rapid fire spread across the façade causing harm to the building occupant, or causing fire spread to the adjacent external wall types, from the thin layer of combustible Sarnafil membrane is considered to be negligible. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT3 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

EWT4 comprises of a silver-coloured ACM cladding panel, which is believed to have been installed on the top 2 floors (4th and 5th floor) of the building on all elevations. Wall build-up for EWT4 is understood to comprise of a silver-coloured ACM cladding panel (which has been fixed back to the building substrate by the aid of metal cladding support rails), followed by a cavity void, Tyvek breather membrane and mineral wool insulation (A1 non-combustible). The substrate behind EWT4 was inspected to be solid A1 non-combustible blockwork. With regards to cavity barrier provisions within EWT4, no proprietary cavity barrier products were observed at any of the inspected locations. By considering these risk factors (as outlined in detail in section 9) and the test against the PAS9980:2022 benchmarks, it is concluded that the external fire spread risk from EWT2 to harm the building occupants is **HIGH**, hence in our opinion, remedial actions are needed to this wall system.

EWT5 comprise of a grey coloured insulated metal cladding panel (non-ferrous) with a pink coloured foam insulation core material. EWT5 is understood to be installed vertically between windows (on the front and rear elevations) and to the best of our knowledge and understanding, EWT5 is installed within the same compartment and does not span across the compartment lines. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT5 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

EWT6 comprise of a grey coloured metal cladding panel (non-ferrous), which has been installed horizontally as part of the staircase curtain walling system on the front and rear elevations of the building (on both the staircases). With regards to cavity barrier provisions within EWT6, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas, however, it should be noted that given that the staircase serves as a single compartment; and therefore, generally, under ADB guidance, does not require proprietary cavity barriers at horizontal floor levels, but only vertically between the curtain walling and the adjacent areas, which in this case is mostly EWT1 (brick). By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT6 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

With regards to external wall attachments, limited to the areas accessed and reviewed during our site inspections, it is best understood that the building comprises of the following attachments.

1. **Metal Bolt on Balconies** – These attachments clearly protrude out, away from the main body of the façade and are located only on one elevation of the building (front). These balconies are designed to serve apartments

located on levels 1-4. Limited to a visual, non-intrusive observation, these balconies appear to be constructed of a metal frame with timber planks installed to both the floor decking and the soffit. The timber planks appear to be installed tightly abutted together with limited gaps in-between, which, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.

2. **Recessed Inset Balconies** – This balcony detail is incorporated within the façade and designed to reside recessed back from the main body of the brick façade (EWT1). The inset balconies are located only on one elevation of the building (rear). These balconies are designed to serve apartments located on levels 1-4 and are believed to be an extension of the concrete floor slab (unless confirmed otherwise) with timber planks to both the floor decking and the soffits. Likewise, as that stated for the metal bolt on balconies, the timber planks are understood to be installed tightly abutted together with limited gaps in-between. This, coupled with a concrete floor slab on to which the timber planks are understood to be installed, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
3. **Terrace/balcony zones** – These areas are understood to be located on the 4th and 5th floor of the building, and understood to comprise of timber decking installed over the concrete floor slab.
4. **Metal Roof Overhang Detail** – This detail is located on top two floors of the building (levels 4 and 5) and understood to be constructed of metal and clad with horizontal timber plank.

The risk of fire spread for the balconies/terrace in the building is considered to be **MEDIUM** and tolerable, hence in our opinion, remedial action is not needed to this wall system.

Each external wall and the building are considered against the PAS9980:2022 benchmark criteria. Based on the fire risk appraisal performed according to the PAS9980:2022 methodology, the overall risk of external walls fire spread in the building is **HIGH**. remedial actions are required for the building external walls as presented in the recommendation section.

From the EWS1 perspective, a B2 rating can be provided following this FRAEW report.

The Fire Risk Assessment is recommended to be reviewed following this FRAEW report.

2.0 INTRODUCTION

Octa Fire has been appointed by Scanlans Property Consultants (*'the Client'*) to produce a Fire Risk Appraisal for External Walls (FRAEW) according to PAS9980:2022 for Agecroft House (*'the building'*), which is situated on 34 Copperas Street, Manchester M4 1HQ.

The building has a multi-occupancy purpose, with a combination of commercial and residential units. The development comprises of 6 storeys (ground plus 5), 2nd to 5th floors consist of apartments, 29 units overall. The 1st floor consists of a landing and the lift. The ground floor consists of an entrance foyer from the street with access to the stair that serves the upper floors and the lift, there is access to the bin room and the electrical room from this foyer. There is no access to the basement, this is used by the commercial occupier on the ground floor.

The building fire safety height (i.e., last habitable floor level) is informed to be less than 18m (approx. 12.423m [11]).

Based on the information provided, it is best understood that the building was completed in 2006. Therefore, the building is likely to have followed guidance contained within Approved Document B, 2000 incorporating 2002 amendments (referred to as ADB 2000 herein), and the relevant British Standards to comply with the UK Building (Amended) Regulation 2000.

The aim of this FRAEW is not to confirm compliance with the Building Regulations, either at the time of construction or currently, but rather to provide a pragmatic and risk-proportionate approach to assessing the risk to occupants (i.e., life safety) from fire spreading over or within the external walls of the building.

This service includes to carry out a fire appraisal of external walls (FRAEW) by analysing the existing façade system configuration, the fire performance of the external walls and the fire strategy based on the PAS9980 methodology. This report outlines our findings, analysis of the external wall systems, and conclusions for the building.

2No. intrusive site inspections were conducted by the Octa Fire's Fire Engineering team on the 25th & 26th of November 2024. See Fig.1 for typical building images.

It has to be noted that Octa Fire have performed this FRAEW report based on the information provided by the client (which includes reports produced by others, such as FPS (Fire Protection Service NW Ltd) and Watts (see Table 1 in section 5.0 for further details)). Information about the buildings fire safety provisions (as produced and supplied by others) have only been reviewed by Octa Fire for the purpose of the FRAEW report's holistic approach.

This FRAEW report is a Basic Level Assessment based on PAS9980:2022. If in-depth analysis is needed, it will be stated clearly in the report.

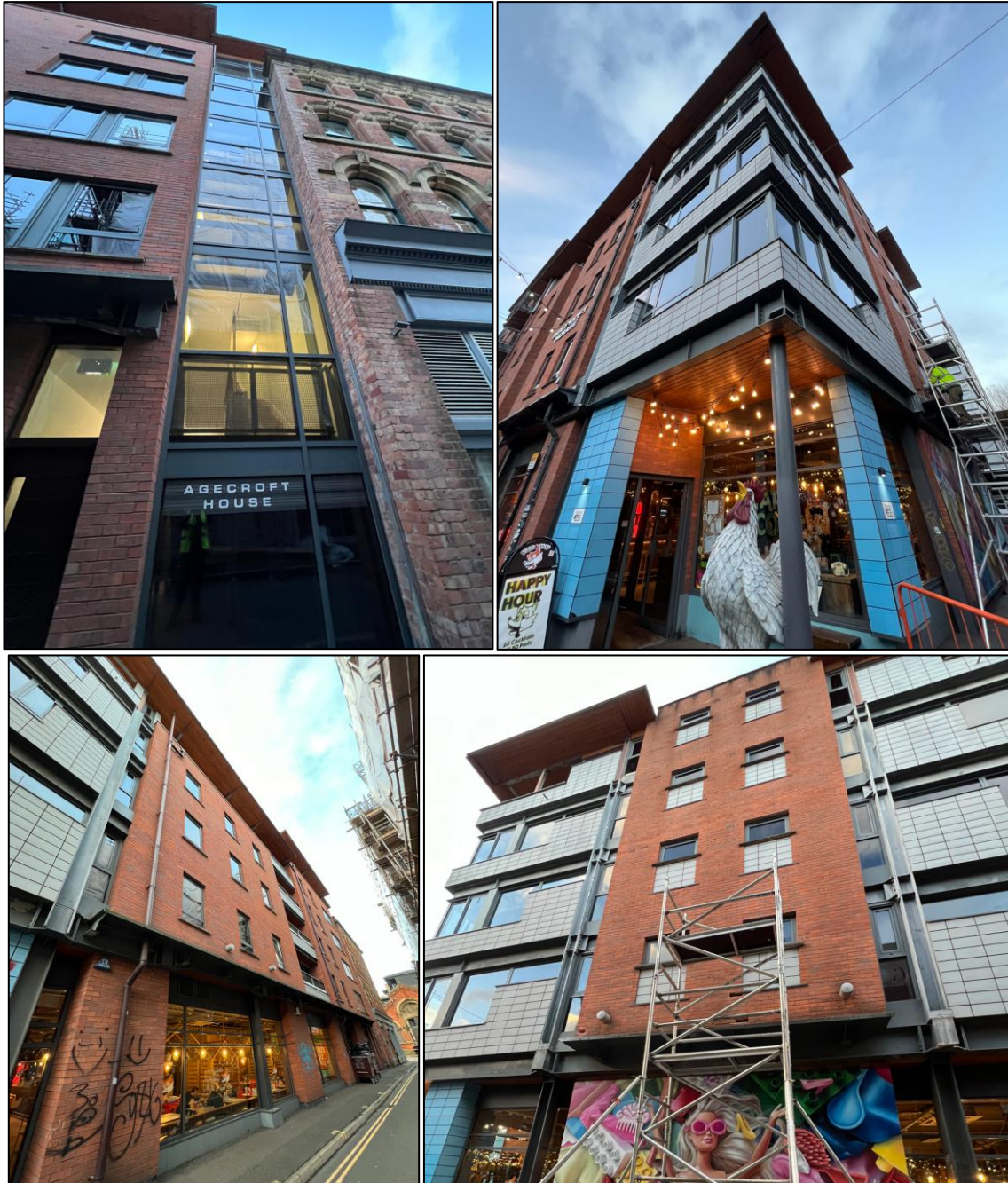




Figure 1 – Typical building images of Agecroft House taken by Octa Fire during our site visit of the building.

3.0 SCOPE OF WORKS

The below scope of services has been included in this appointment to ensure an accurate result of this Fire Risk Appraisal for External Walls (FRAEW) based on PAS9980:2022:

- Review of all provided relevant fire safety documents by the client, as listed out in Table 1.
- 2No. intrusive EW site inspections, as well as a general walk around through the internal communal areas of the development (where access was granted), has been carried out by the Octa Fire's Engineering team.
- Perform the Basic Level Assessment Fire Risk Appraisal for External Walls (FRAEW) based on PAS9980:2022 methodology.

4.0 LIMITATIONS

The below points are inherent limitation of FRAEW report, which should be well considered:

- The FRAEW is intended primarily to inform to building's Fire Risk Assessment (FRA).
- It might not be possible to identify the full scope of remediation work needed as part of the FRAEW from the outset, as the conclusion might be that a further inspection or in-depth technical assessment is needed (which might necessitate the involvement of other professionals).
- The FRAEW addresses life safety only. The property protection, business continuity and firefighter safety are not part of the assessment.
- The FRAEW cannot warrant absolute safety, as it will be risk-based and therefore reliant on professional judgement by competent persons.
- Risk factors for the fire spread from one building to another, external wall fire resistance performance, and design audit have not been considered in this assessment.

- It can only be based on available industry knowledge at the time of the FRAEW and, more definitive information on the fire performance of external wall construction might come to light subsequently.
- The findings of this assessment are based on the information and documentation provided to Octa Fire by the client prior to the assessment being undertaken, and the findings of the site. Octa Fire are not responsible for any new information being made available after the assessment has been conducted. If this was to happen a full review of the FRAEW might be needed to be undertaken.
- Reference with the Clause 4.2 of the PAS9980, external wall assessor should establish that a risk-based approach has been taken in producing the FRAEW and its' outcomes, and not based on: strict compliance with guidance to building regulations (current or otherwise); OR an unrealistic attempt to establish zero risk.

Further limitations of this report:

- Octa Fire has not reviewed any areas of development other than those identified in our report. We offer no comment on the adequacy, or otherwise, of any other aspects of the development (whether related to fire safety or any other issue) and any absence of comment on such issues should not be regarded as any form of approval.
- It is important to note that the advice contained within this report should not be used for buildings other than that named in the title.
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- Whilst every care is taken to interpret the Acts, Regulations and Approved Codes of Practice, these can only be authoritatively interpreted by Courts of Law.

5.0 DOCUMENT REVIEW

This report is based on the details gathered from Octa Fire's intrusive site visits and the documents listed in Table 1, as provided by the client, which have been thoroughly reviewed by the author to identify the range, quality and reliability of the information. It was found that the below-provided documents have an acceptable level of quality and reliability information to rely on to perform this FRAEW report, although the author had to assume and estimate many factors as they are stated explicitly in the report.

Table 1: Provided documents by the client for review:

No.	Report Title	Reference No.	Version	Date	Prepared by
1.	Fire Risk Assessment (FRA) – FPS Ltd		-	20/06/2024	Eric Mills – FPS Ltd
2.	First Floor Walls Showing Second Floor Structure Over	J1187/08	G	12.10	BMC
3.	Second Floor Walls Showing Third Floor Structure Over	J1187/ 09	G	12.10	BMC
4.	Third Floor Walls Showing Fourth Floor Structure Over	J1187/10	G	12.10	BMC
5.	Fourth Floor Walls Showing Fifth Floor Structure Over	J1187/ 11	H	12.10	BMC
6.	Fifth Floor Walls Showing Roof Floor Structure Over	J1187/ 12	G	12.10	BMC

7.	Proposed Front Elevation	J1187/ 14	C	01.11	BMC
8.	Proposed Side Elevation	J1187/ 15	D	01.11	BMC
9.	Proposed Rear Elevation	J1187/ 16	D	01.11	BMC
10.	Fire strategy Floor plans	0817/AL060	A	Feb 2010	Reid
11.	Cladding Register and Report	126441	A	21/12/2017	Watts

Building regulations and guidance shall be considered and consulted in conjunction with this report, including the following:

- PAS 9980:2022 Fire risk appraisal of external wall construction and cladding of existing blocks of flats - Code of practice
- The Building Regulations 2010;
- The Regulatory Reform (Fire Safety) Order 2005;
- Fire Safety Act (2021);
- Building Safety Act (2022);
- Approved Document B (all related versions);
- BS9999 and BS9991; and
- Any other standards mentioned in this report and/or applied to the building.

6.0 BUILDING DETAILS

6.1 Building Description

Agecroft House is a multi-occupancy development, with a combination of commercial and residential units. The building is located on 34 Copperas Street, Manchester, M4 1HQ. For ease of understanding, Fig.2 (A, B & C) and 3 have been added to help illustrate the building and to provide a satellite aerial view of the development.

The building has a multi-occupancy purpose, with a combination of commercial and residential units. The development comprises of 6 storeys (ground plus 5), 2nd to 5th floors consist of apartments, 29 units overall. First floor consists of a landing and the lift and the ground floor consists of an entrance foyer from the street with access to the stair that serves the upper floors and the lift, there is access to the bin room and the electrical room from this foyer. There is no access to the basement, this is used by the commercial occupier on the ground floor. There are two protected staircases. The staircases are situated on the ground floor that provides access to upper floors at both entrances. See building floor plans, as taken from site, under section 6.2 of this report.

Based on the information provided, it is best understood that the building was completed in 2006.

The last habitable floor height of the building, as per diagram D6 of ADB (see Fig.4) is informed to be less than 18m (approx. 12.423m [11]).

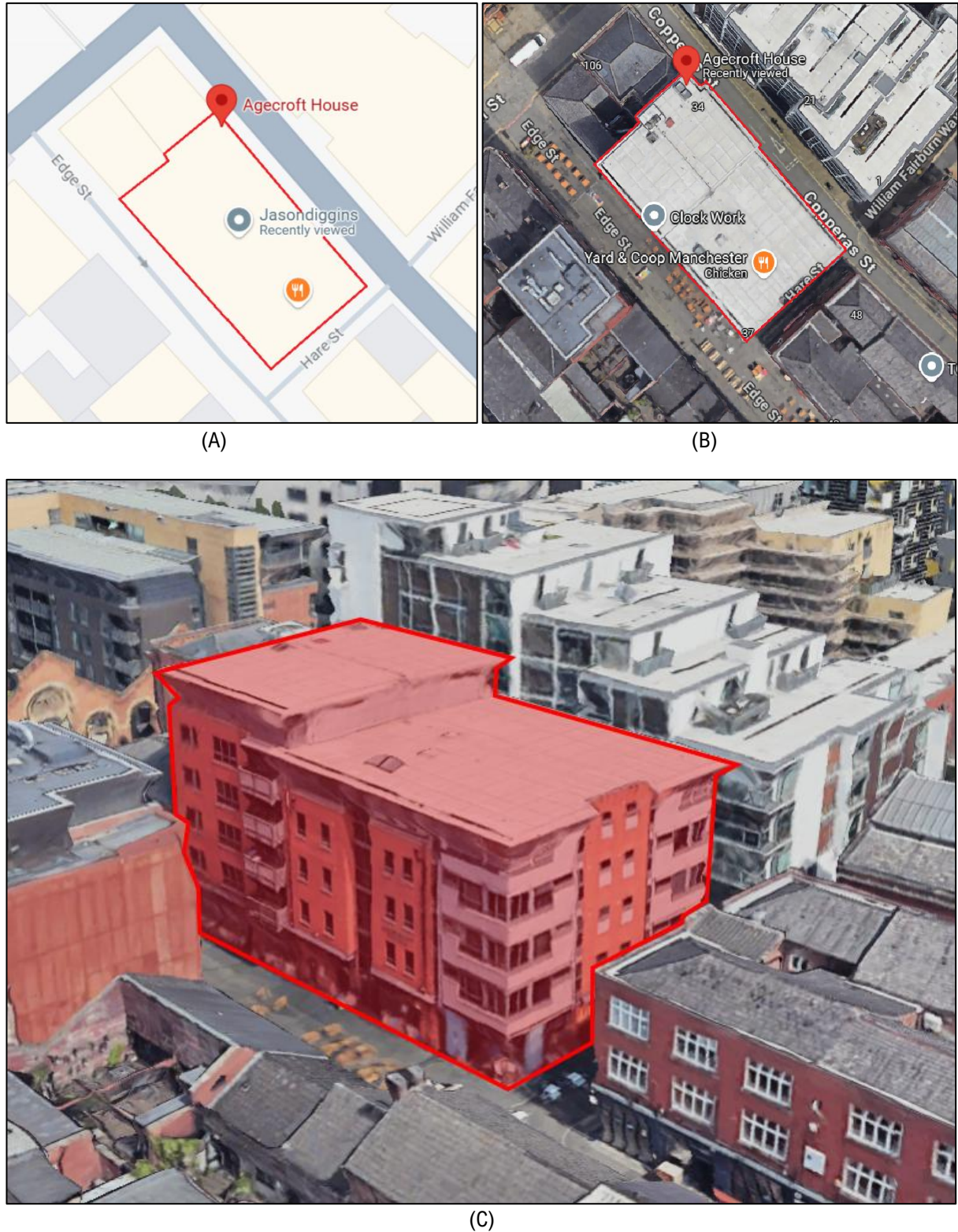


Figure 2 – (A) & (B) Location of building; (C) - 3D Site view extracted from Google Earth.

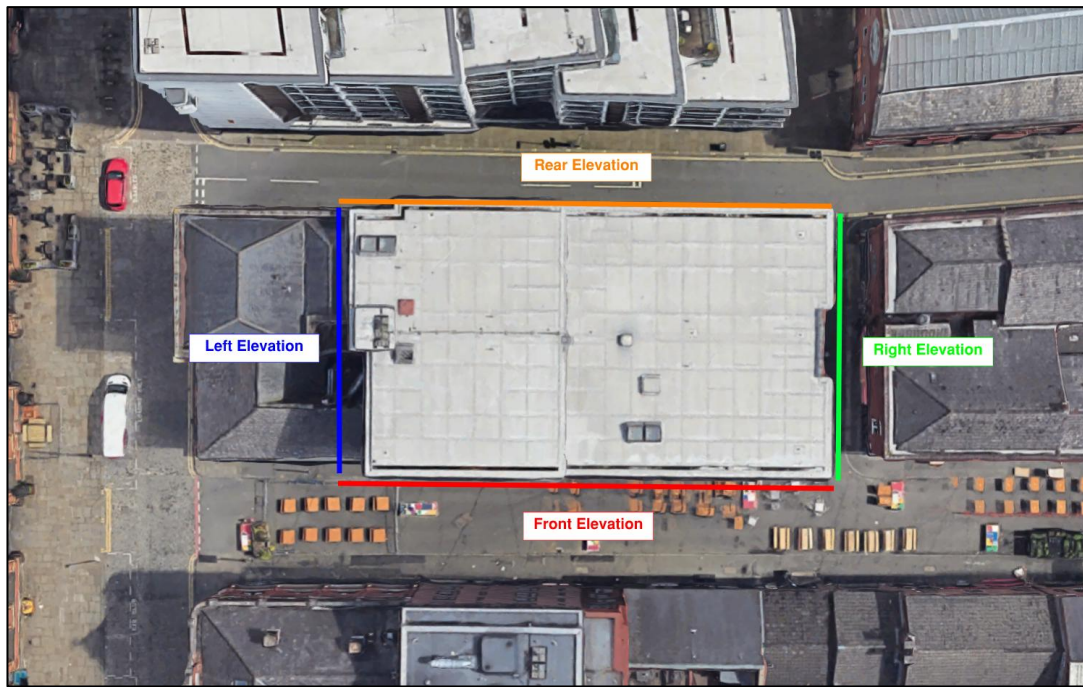


Figure 3 – Marked up building elevations.

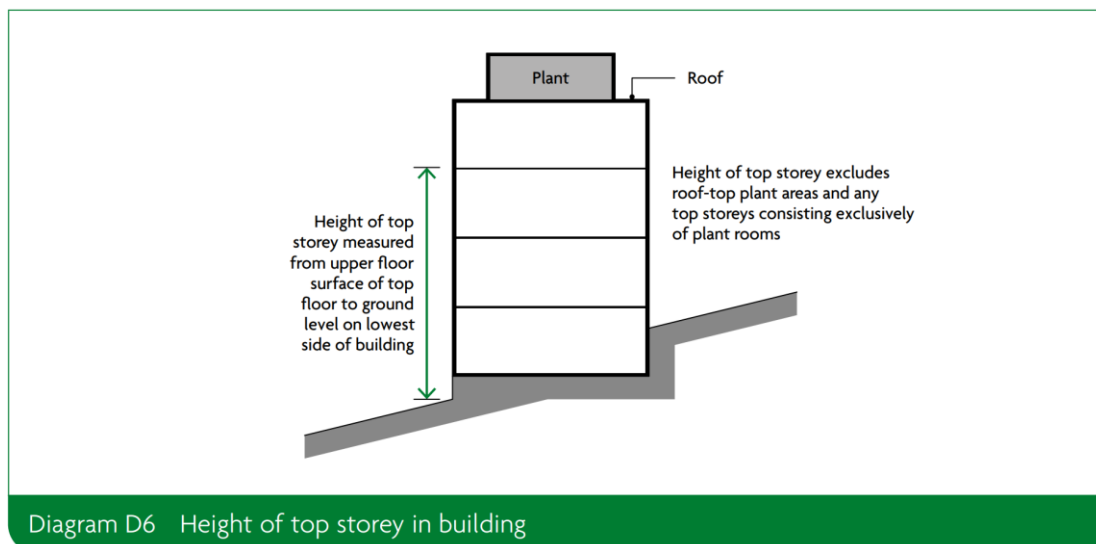


Figure 4 – Height of top storey in building, extracted from the latest version of the ADB.

6.2 Fire Safety Measures

This section provides the fire safety measures in the building, which are taken from the FRA report [1].

Evacuation Strategy:

FRA [1] states that, site-specific Fire Evacuation Procedures should be in place to ensure that all persons are aware of what to do in a Fire Emergency. However, based on our general walk around through the internal areas of the building (where access was granted), fire action notice was observed posted in the communal areas of the building, which stated the following:

'IF YOU DISCOVER A FIRE IN YOUR APARTMENT

1. Warn everyone in the apartment. Make sure everyone leaves. Remember the Fire Brigade advice "Get out! Stay out! Call us out!"

2. Ensure the Fire Brigade are called.
3. Sound the alarm at the nearest break-glass point as you leave.'

Based on the above, it is our understanding that the building currently operates on a 'Stay put' Policy, unless confirm otherwise by the client. See Fig.5 & 6 for further details.

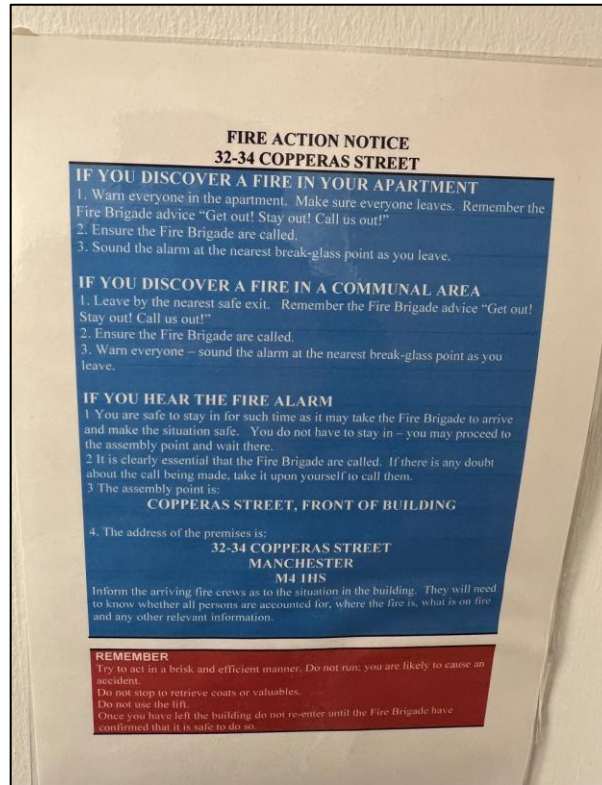


Figure 5 – Fire action notice posted in the communal corridor of the building.

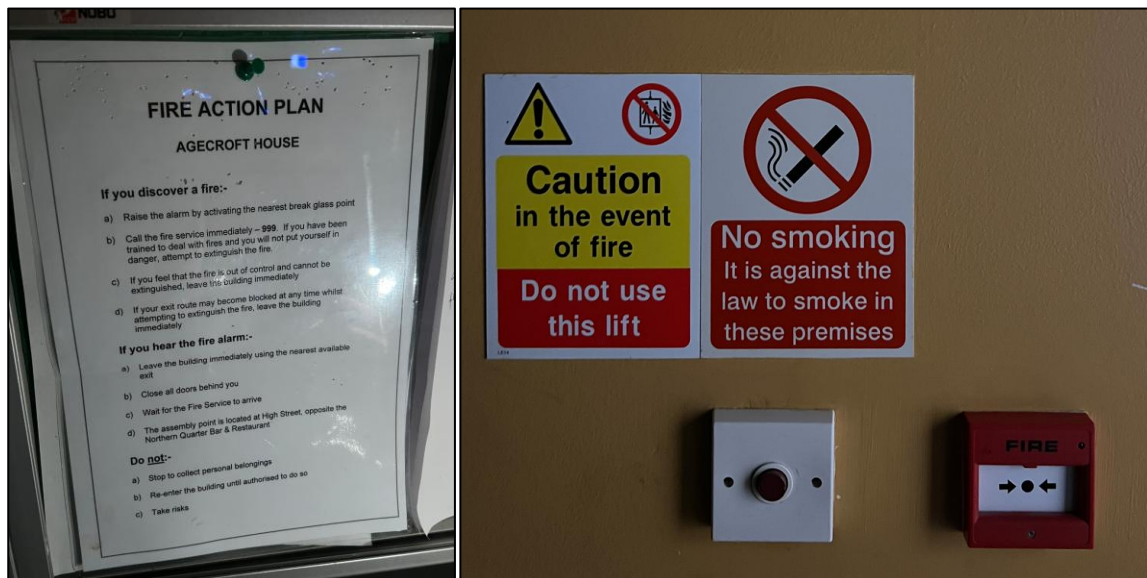


Figure 6 – Fire action plan, images taken by Octa Fire.

Means of Escape:

Based on the recent FRA [1], premises is provided with adequate means of escape. There are **two** protected means of escape, this is by two staircases provided for the premises separated at each level by fire rated doors. However, as reported within the FRA, some of the fire doors that lead onto the means of escape staircase for the office

accommodation were left wedged open. It is recommended in the FRA that all fire doors are checked and adjusted to ensure the fire resistance for the means of escape is maintained.

Fire assembly points are located outside the building, and staff are aware of their locations. Emergency exits sign are clearly displayed, and all final exit doors open freely without obstruction [1].

Self-closing fire-resisting doors are in good conditions, clear of obstructions, and properly signed with “Fire Door Keep Shut” or “Automatic Fire Door Keep Clear.” Fire-resisting doors to plant rooms are secure, with appropriate signages. All fire exits and routes are clearly indicated with directional signages [1].

Compartmentation:

The FRA report [1] states that the compartmentation that could be observed appeared to be of suitable fire resisting construction. Fire separation between these different occupancies is to a minimum 60-minute fire resistance.

Smoke and Ventilation System:

According to the FRA, the premises are provided with smoke vents for the staircases and for the communal corridors. The smoke vents were last tested and maintained on 21/04/2022, with having regular testing for the smoke ventilation and smoke control curtain for correct operations.

Based on our site visit, 2No. openings were noted at the head of the staircase (which are believed to be AOV's, unless confirmed otherwise); and lobby smoke ventilation panel was also noted at the ground floor, see Fig.7.



Figure 7 – AOV's at the head of the staircase (left); and lobby smoke ventilation on the ground level (right), image taken by Octa Fire.

Fire Detection & Alarm System:

The FRA [1] states that the premises is provided with fire alarm/detection system appropriate for this type of occupancy. However, it does not exactly state what type of alarm system has been provided throughout the building i.e., a standard L2 or an enhanced L1 system.

The FRA [1] also states that the fire alarm is tested weekly and recorded in a logbook, which is kept in the documents box, however this was locked, and access could not be gained at the time of their visit. A fire detector in the communal

kitchen for the office accommodation was found to be covered by a plastic bag on the day of the assessment. This cover should be removed as soon as possible to allow the fire detector to function properly.

Based on our site visit, Fire alarm control panel was noticed at the ground floor and smoke detectors were noted in the common corridors and the staircase, see Fig.8 & 9.



Figure 8 – Fire alarm, image taken by Octa Fire.



Figure 9 – Smoke detectors installed in the communal corridors and the staircase.

Fire Suppression:

As per the FRA document [1] and based our site visit, no sprinkler system has been installed in the building.

Firefighting Facilities & Access:

As per the FRA document [1], the fire service access is deemed to be satisfactory. Hydrants or other water supplies are located suitably close to the premises.

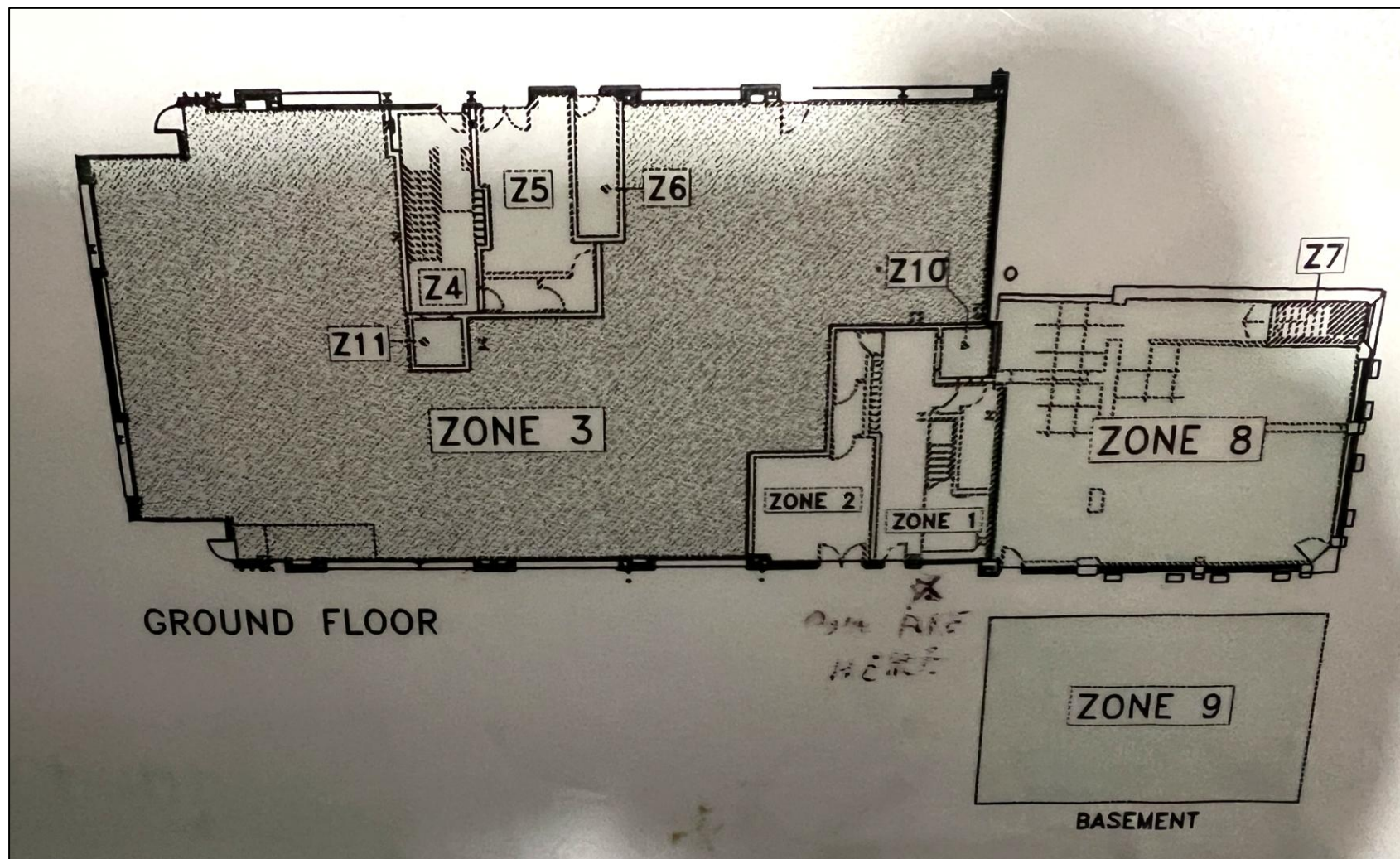
Rising Mains:

No information has been provided in the FRA with regards to riser within the building.

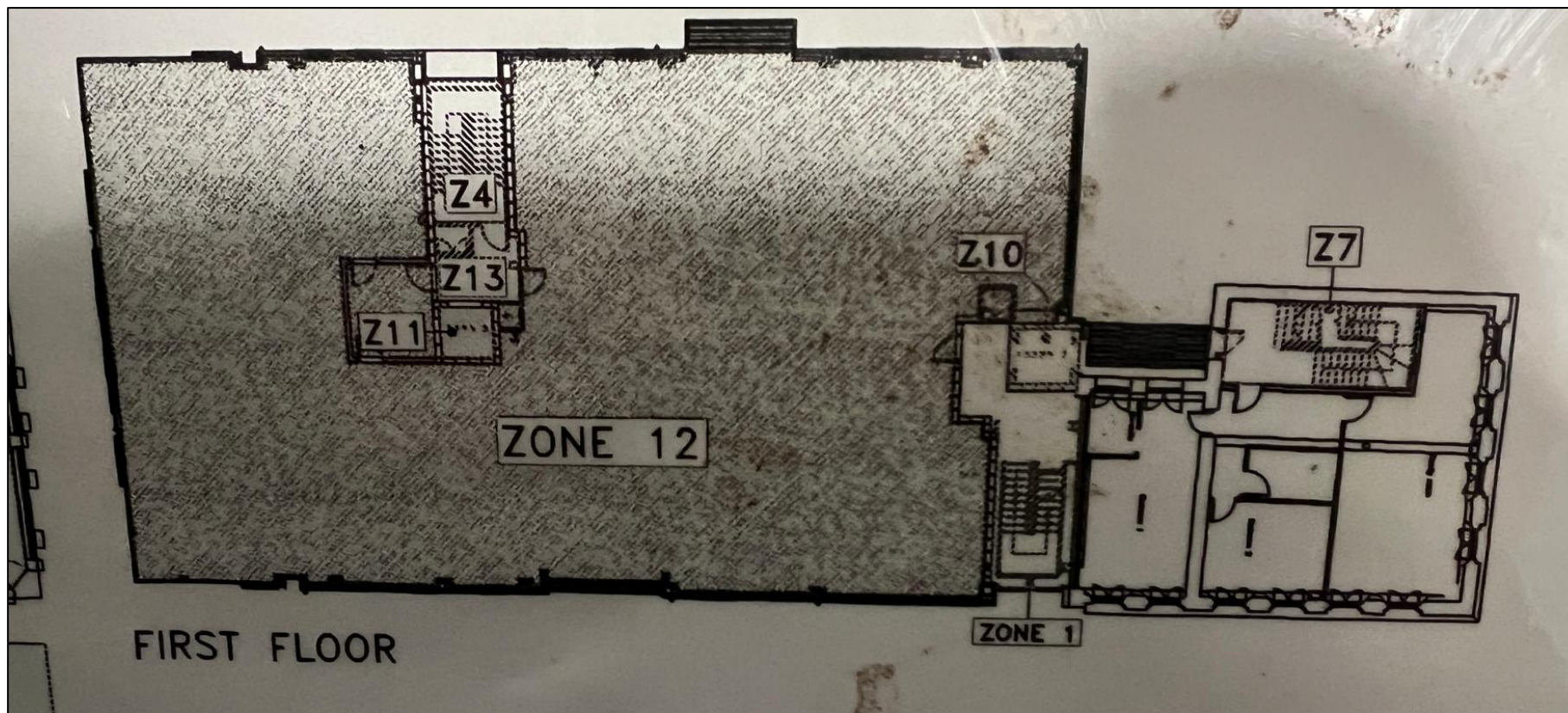
Lifts For Use By Fire Service (firefighting lift):

No firefighting lifts are required as the building is not over 18m to top floor.

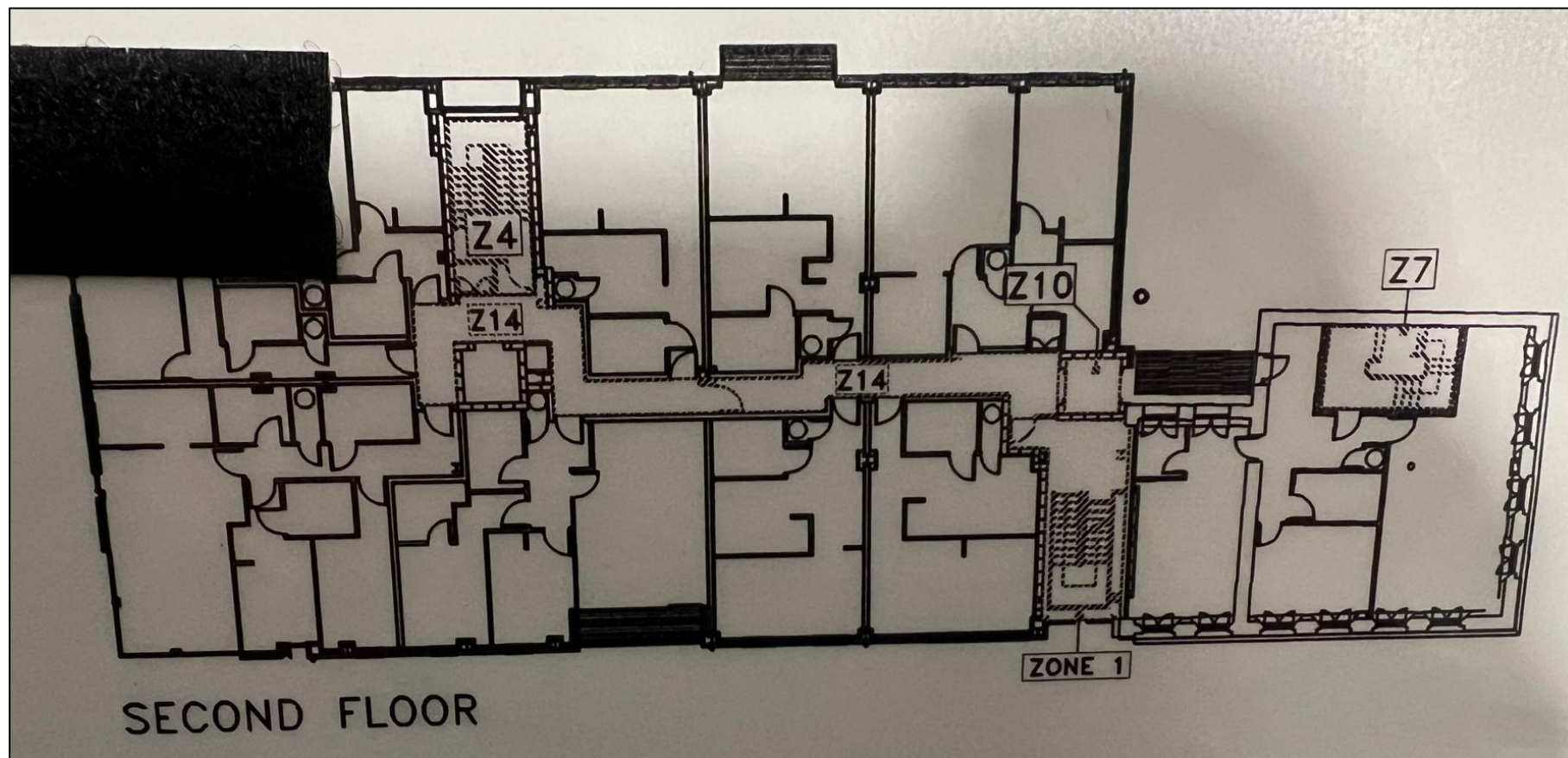
Ground Floor plan



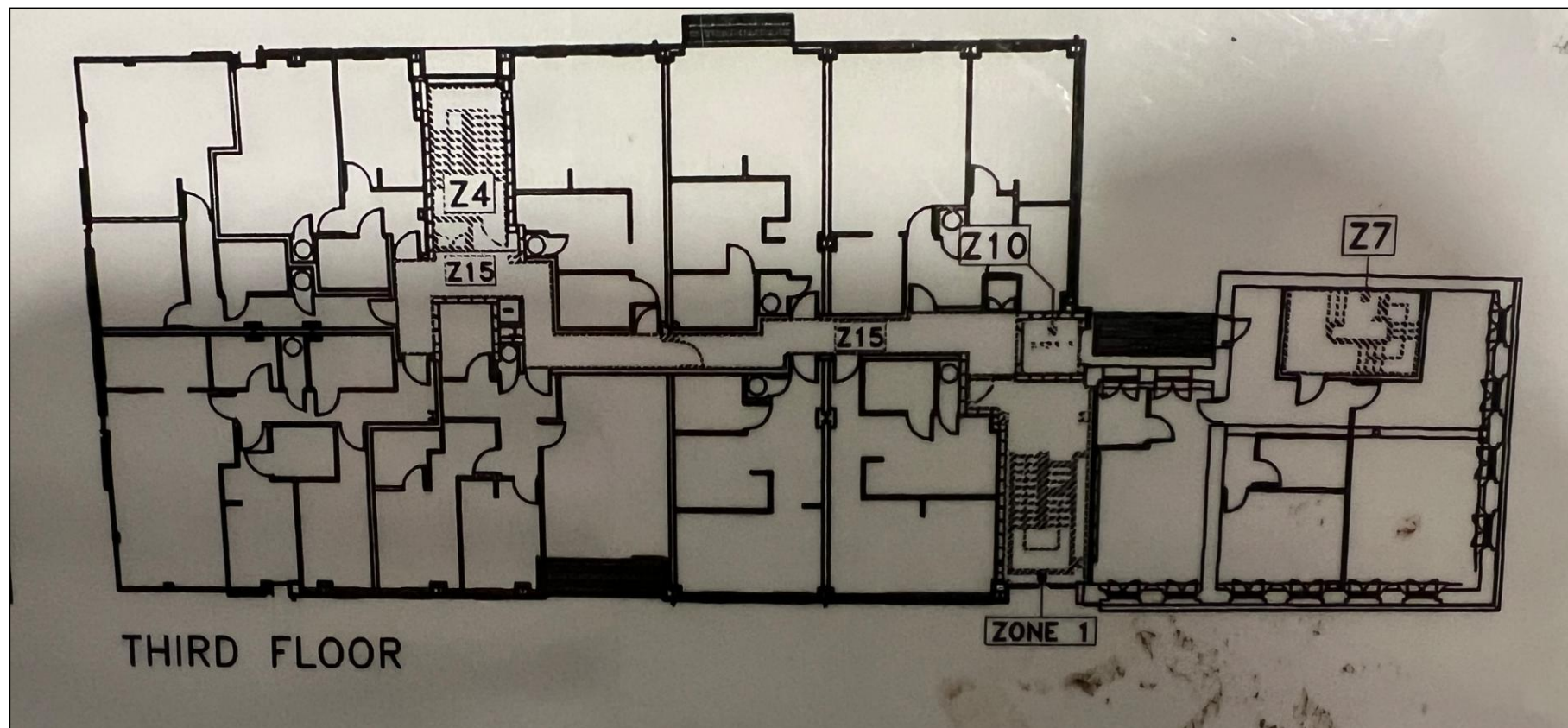
First Floor Plan



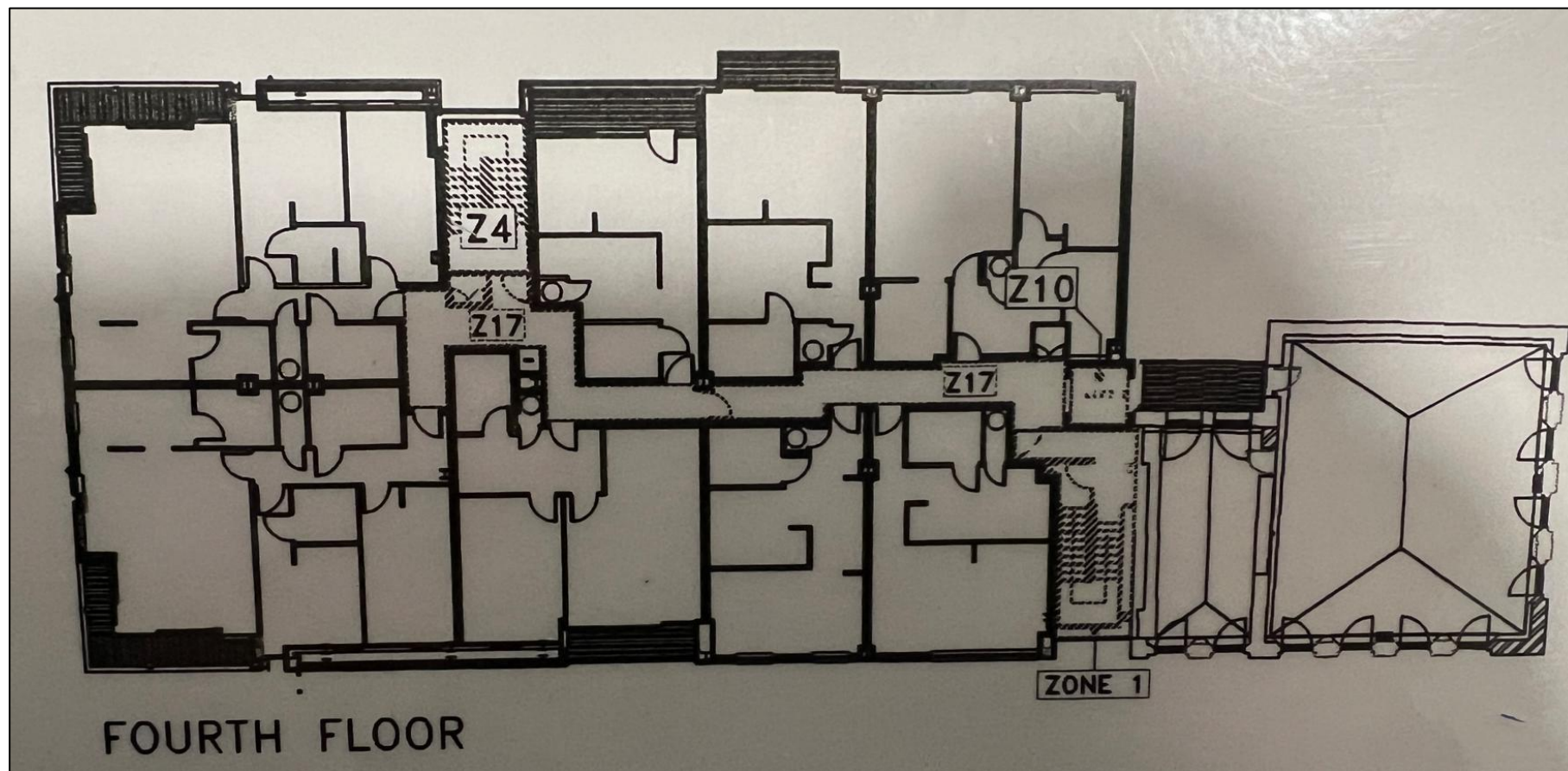
Second Floor Plan



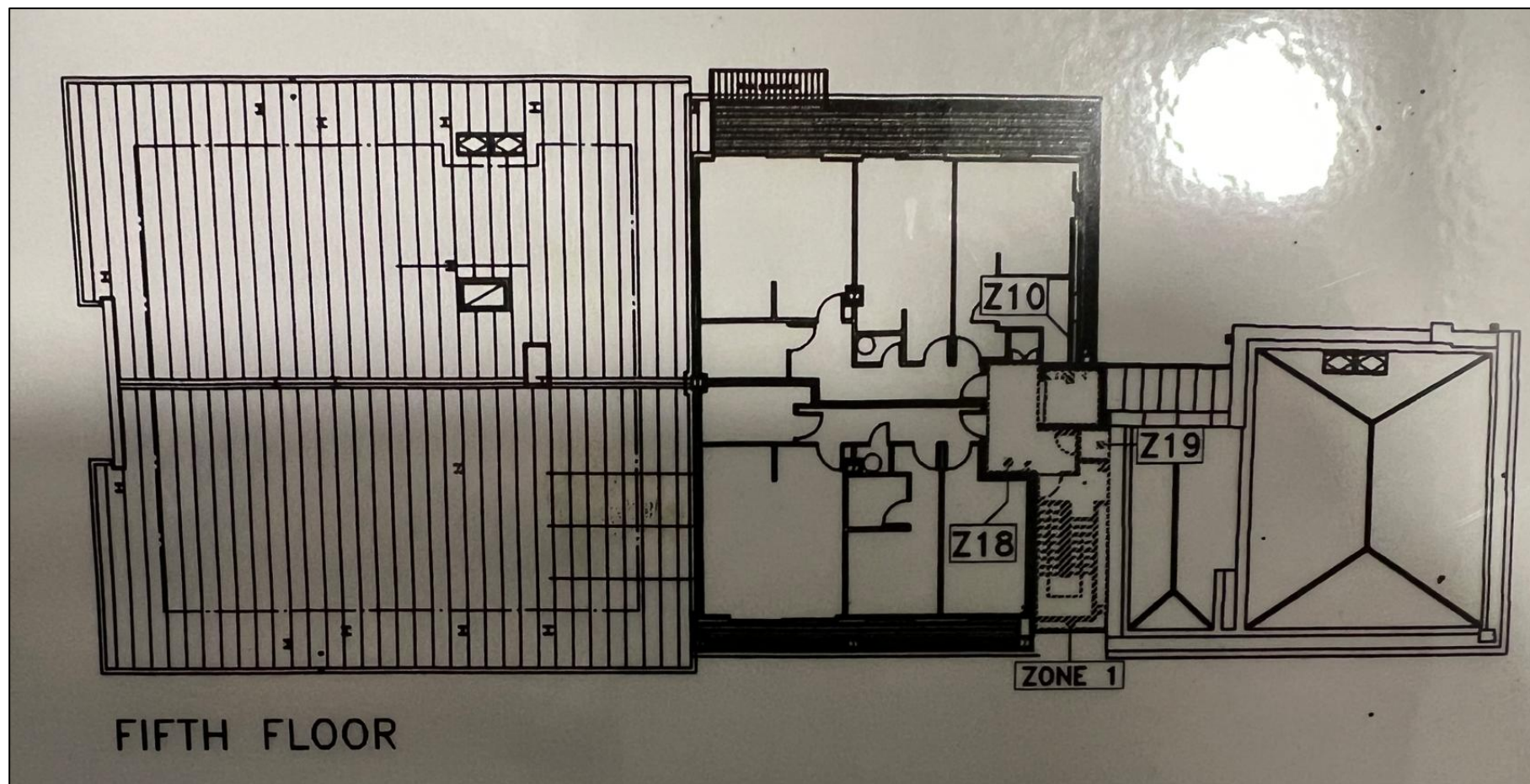
Third Floor Plan



Fourth Floor Plan



Fifth Floor Plan



7.0 LEGISLATION AND GUIDANCE DOCUMENTS

7.1 Regulatory Context

Superseding the Fire Precautions Act 1971, the Regulatory Reform (Fire Safety) Order 2005 places the responsibility on individuals within an organisation to carry out risk assessments to identify, manage and reduce the risk of fire.

The Fire Safety Act 2021 clarified that structure, external walls and flat entrance doors fall within the scope of the Fire Safety Order (FSO). The Fire Safety Act requires responsible persons to ensure that these elements are included in their fire risk assessments if they have not been covered already.

In line with article 6 of the Regulatory Reform (Fire Safety) Order 2005 (as amended), the order applies to the building's structure and external walls and any common parts where a building contains two or more sets of domestic premises.

Future building works on the external shall comply with regulation 7(1) of the Building Regulations (2022 amendments) where applicable.

Under Regulation 7(4) of the Building Regulations, a relevant building is defined as a building with a storey (not including roof top plant areas or any storey consisting exclusively of plant room) at least 18 meters above ground level and which contains one or more dwellings, contains an institution, or contains a room for residential purposes.

7.2 Applicable Regulations at the Time of Construction

At the time of construction, the external walls should have been designed to comply with part B4 of Building Regulations 2000 where *"The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building"*.

Based on the information provided [1], it is best understood that the building was constructed in 2006. Therefore, the building is likely to have followed guidance contained within Approved Document B, 2000 incorporating 2002 amendments (referred to as ADB 2000 herein), and the relevant British Standards to comply with the UK Building (Amended) Regulation 2000.

At the time of construction, following the design guidance for compliance with Part B4 by following ADB (2000) this would have included provisions of cavity barriers and firestopping, regardless of building/last habitable floor height.

Clause 13.5 of ADB (2000), stated the following:

"The external surfaces of walls should meet the provisions in Diagram 40 in Fig.9. However, the total amount of combustible material may be limited in practice by the provisions for space separation in Section 14 (see paragraph 14.7 et seq). Where a mixed-use building includes Assembly and Recreation Purpose Group accommodation, the external surfaces of walls should meet the provisions in Diagram 40c."

Note: *One alternative to meeting the provisions in Diagram 40 could be BRE Fire Note 9 Assessing the fire performance of external cladding systems: a test method (BRE, 1999)."*

Clause 13.6 of ADB (2000), stated the following:

"In the case of the outer cladding of a wall of 'rainscreen' construction (with a drained and ventilated cavity), the surface of the outer cladding which faces the cavity should also meet the provisions of Diagram 40 (see Fig.10)."

Clause 13.7 of ADB (2000), stated the following:

"The external envelope of a building should not provide a medium for fire spread if it is likely to be a risk to health or safety. The use of combustible materials for cladding framework, or of combustible thermal insulation as an

overcladding or in ventilated cavities, may present such a risk in tall buildings, even though the provisions for external surfaces in Diagram 40 may have been satisfied.

In a building with a storey 18m or more above ground level, insulation material used in ventilated cavities in the external wall construction should be of limited combustibility (see Appendix A of ADB). This restriction does not apply to masonry cavity wall construction which complies with Diagram 32 in Section 10 (Fig.11).

Advice on the use of thermal insulation material is given in the BRE Report Fire performance of external thermal insulation for walls of multi-storey buildings (BR 135, 1988)."

Advice on the use of thermal insulation material is given in the BRE Report Fire performance of external insulation for walls of multi-storey buildings (BR 135,1988)". BR 135 (1988) states:

"The range of insulation materials found in the external wall build-up can vary (see Table 1). For general refurbishment or masonry-based systems a single product is typically applied to the supporting structure, using a combination of mechanical and / or adhesive-based systems. On uneven or lightweight frame systems that require a cavity between the insulation layer and the sheathing boards, railing systems are typically applied; these will also require the selection of appropriate fire barriers to close the cavity in the event of a fire."

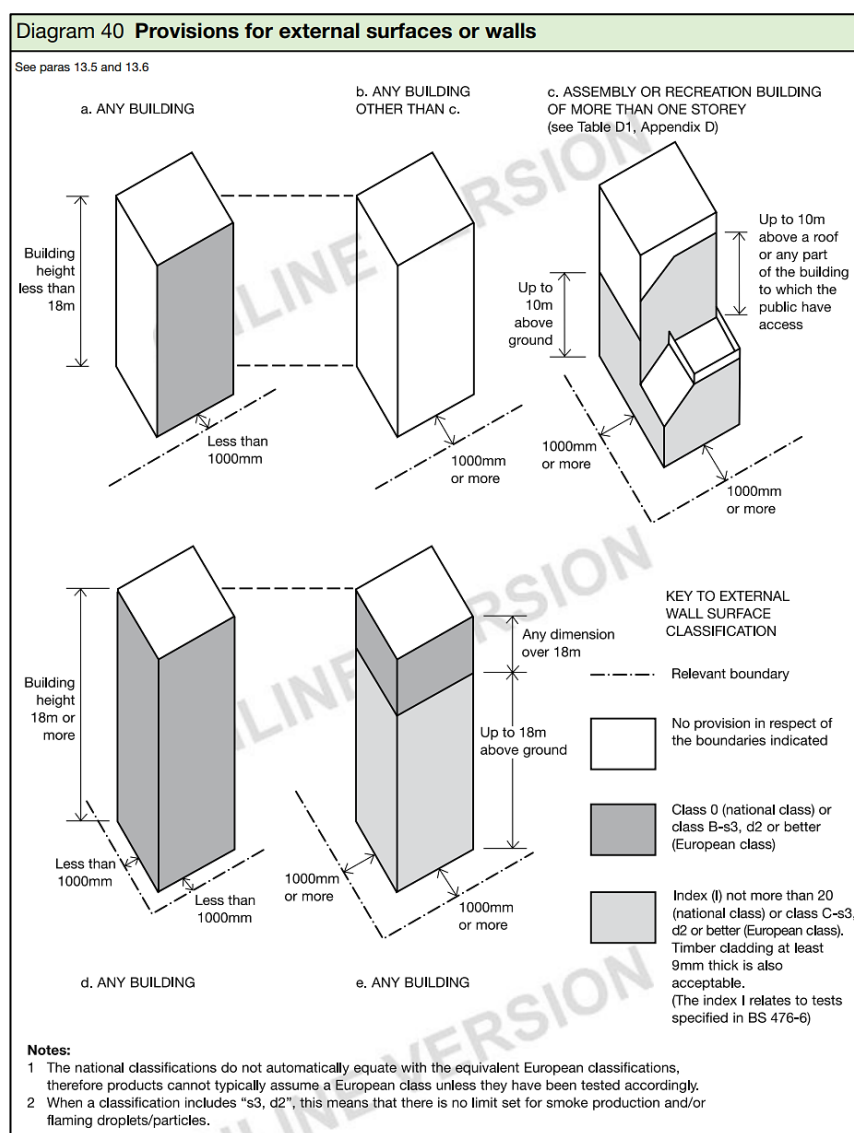
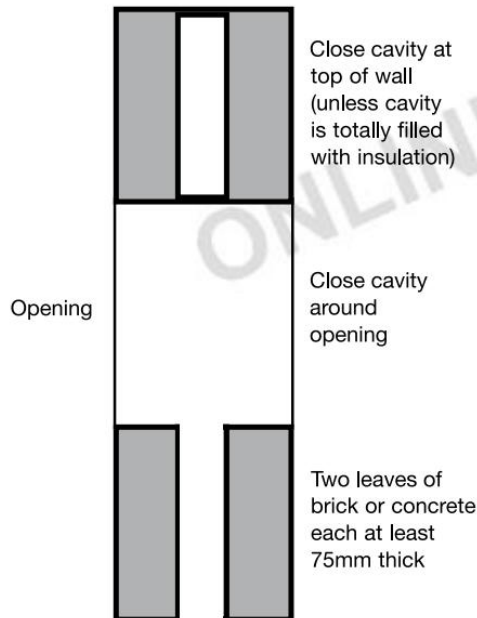


Figure 10 – Diagram 40 Provisions for external surfaces or walls, extracted from ADB.

Diagram 32 Cavity wall excluded from provisions for cavity barriers

See Table 13, items 1, 3 and 4

SECTION THROUGH CAVITY WALL



Note: Combustible material should not be placed in or exposed to the cavity, except for:

- a. timber lintels, window or door frames, or the end of timber joists;
- b. pipe, conduit or cable;
- c. DPC, flashing, cavity closer or wall tie;
- d. thermal insulating material;
- e. a domestic meter cupboard, provided that:
 - there are no more than two cupboards per dwelling,
 - the opening in the outer wall leaf is not more than 800 x 500mm for each cupboard, and
 - the inner leaf is not penetrated except by a sleeve not more than 80 x 80mm, which is fire-stopped.

Figure 11 – Diagram 32 Cavity walls excluded from provisions for cavity barriers, extracted from ADB 2000.

7.3 Current Regulations and Best Practice

Future building works on the external shall comply with regulation 7(1) of the Building Regulations 2010 (2022 amendments).

Under Regulation 7(4) of the Building Regulations, a relevant building is defined as a building with a storey (not including roof top plant areas or any storey consisting exclusively of plant room) at least 18 meters above ground level and which contains one or more dwellings, contains an institution, or contains a room for residential purposes.

The height of the topmost occupied storey/floor level of the building is understood to be less than 18m (not a relevant building); and therefore, the requirements put forward in 7(2) of the building regulations 2010 (2022 amendments) are currently not applicable to this building.

Whilst the applicable design guidance on future works will depend on the nature of the works (enhancements or material alteration/change of use), it is recommended to still apply in both cases the latest design guidance of Approved Document B, Vol.1 (2019 including 2022 amendments).

Clause 10.7 of ADB Vol.1 (2019 inc. 2022 amendments) states that:

'In buildings that include a 'residential' purpose (purpose groups 1 and 2) with a storey 11m or more in height (see Diagram D6 in Appendix D of ADB) any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar) etc. used in the construction of an external wall should be class A2-s1, d0 or better (see Appendix B of ADB). This restriction does not apply to masonry cavity wall construction which complies with Diagram 8.2 in Section 8. Where regulation 7(2) applies, that regulation prevails over all the provisions in this paragraph.'

Given that the height of the topmost occupied storey/floor level of the building is less than 18m but more than 11m (Approx.12.423m [11]), the above clause would be applicable if reviewed under the latest building regulation (ADB Vol.1 (2019 inc. 2022 amendments)).

The Building Safety Act 2022 received Royal Assent in April 2022 and the secondary legislation is also introduced to support the transition for the Act to be enforced. The Act applies to all building including higher-risk buildings defined as high-rise residential buildings (including student accommodation), hospitals and care homes that are at least 18 metres or seven storeys high. All occupied higher-risk residential buildings will be required to have an Accountable Person, who will be legally responsible for ensuring that the fire and structural safety of their building(s) are being properly managed. A 'golden thread' of documents and information to be provided once construction is complete.

8.0 EXTERNAL WALL SYSTEMS & DETAILS

In this section of the report, details about the external wall systems installed on the building have been presented. The information outlined in this section relies on the document provided, and 2No. intrusive site inspections conducted by Octa Fire.

It is important to note that as part of this assessment, we have not undertaken any material fire testing, nor have been provided with any test data or technical data sheets for the installed external wall materials; and therefore, the Euro-class reaction to fire classification ratings stated for the materials are only indicative and based on current industry knowledge and in some cases, an educated assumption.

It is best understood that there are 6No. primary external wall systems installed on the building, and these have been summarised below:

Typical images of the external wall types (EWT) are shown in Fig.12-17.

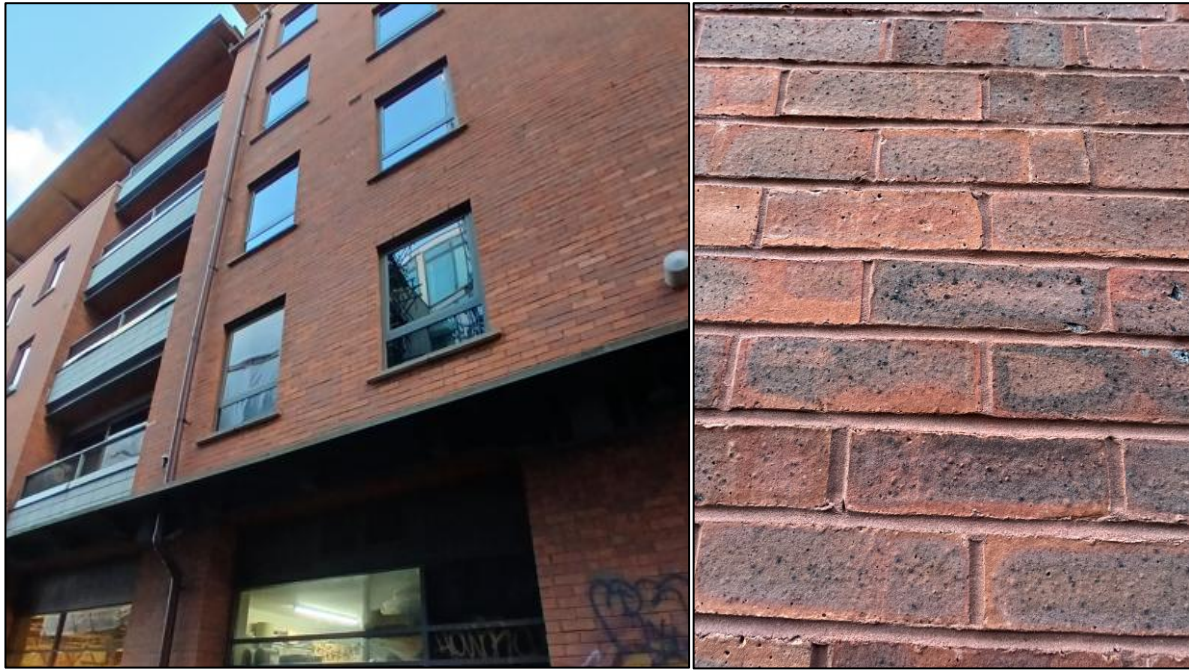


Figure 12 - Traditional brick facade - EWT1





Figure 13 – Grey/blue terracotta tiles – EWT2.



Figure 14 – Grey metal cladding panels – EWT3.

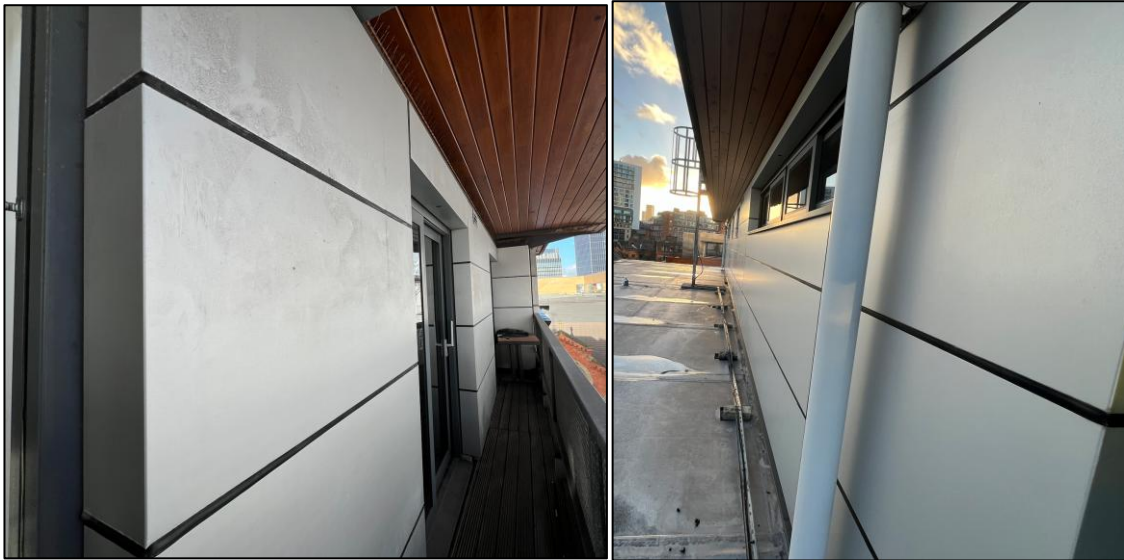


Figure 15 – Silver ACM cladding panels – EWT4.



Figure 16 – Grey insulated window cladding panels – EWT5



Figure 17 – Curtain walling – EWT6

8.1 External Wall Type 1 – Traditional Brick Façade (EWT1)

EWT1 comprise of masonry facing brick façade, which covers majority of the building envelope and has been installed from ground to 4th floor of the building on all elevations.

Based on the areas inspected during our intrusive site inspection, it is best understood that EWT1 comprises of the following build-up (stated from external to internal):

- **Circa 100mm thick Outer Brick** - Euroclass A1 non-combustible;
- **Mineral/Glass wool insulation within the Cavity** - Euroclass A1 non-combustible;
- **Black EPDM Membrane (noted at the inspected floor level)** - Unknown, assumed to be combustible; and
- **Blockwork Substrate** – Euroclass A1 non-combustible, a thickness more than 75mm is assumed.

EWT1 is understood to comprise of a brick and blockwork configuration with mineral/glass wool insulation material within the EW cavity zone.

Based on the above, it can be concluded that the primary external wall materials within EWT1, with the exception of the thin EPDM membrane (which was only found at the horizontal floor slab level), are of A1 non-combustible nature, which will not add to the fire load or cause rapid fire spread across the facade.

With regards to cavity barrier provisions within EWT1, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas (i.e., compartment lines, window openings and vent penetration).

Openings, such as windows, have been created by returning the outer brick to form a reveal detail at the jambs. A steel lintel has been installed at the window head detail and the cill is closed off with a solid stone slab, and in some areas, a metal ferrous flashing has been installed.

Nonetheless, since EWT1 is a double leaf masonry wall system, and assuming that the blockwork substrate is >75mm thick, under ADB guidance, there are no requirements for fire rated cavity barriers (designed to afford a minimum of 30 minutes integrity and 15 minutes insulation) to be installed within the external wall cavity zone, only cavity closers around the external wall openings (which, to our understanding, are not required to afford any fire resistance rating and can be created using a window or a door frame). The reason behind this is to prevent the passage of air flow into the cavity zone.

Furthermore, it should be noted that a double leaf masonry system is only exempt from the provisions of fire rated 30/15 cavity barriers, provided that the external wall system fully complies with all the requirements outlined within ADB (Fig.18, showing Diagram 8.2 of the current ADB).

Typical inspection images for EWT1 are shown in Fig.19.

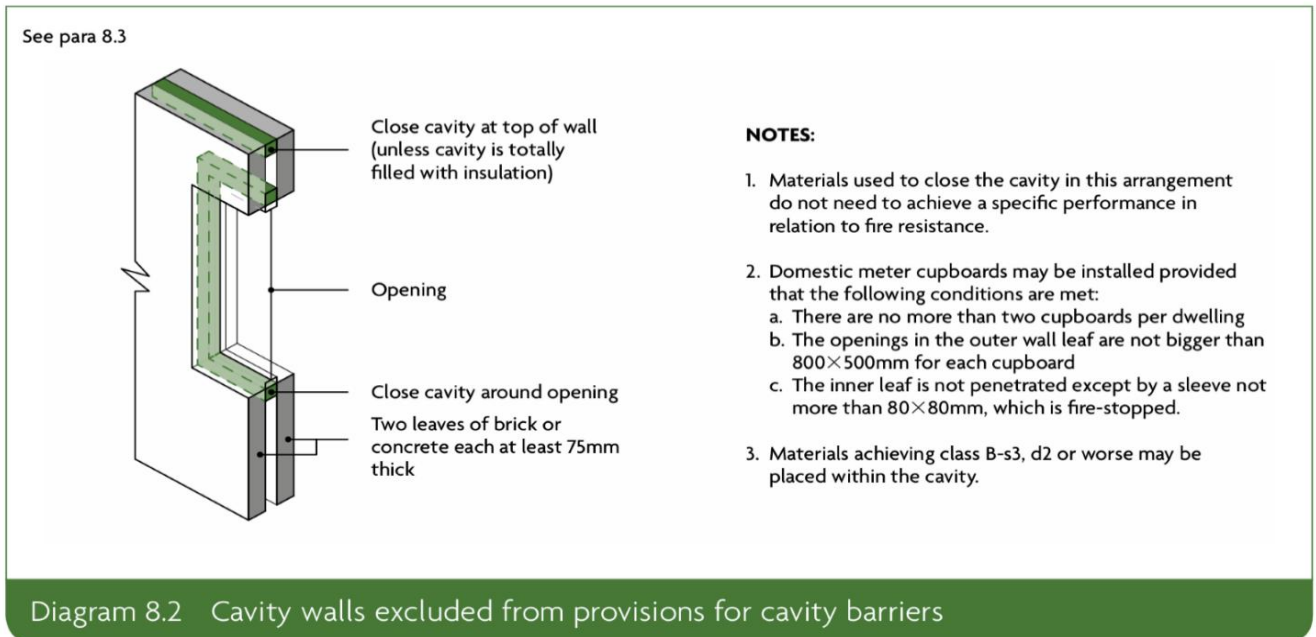
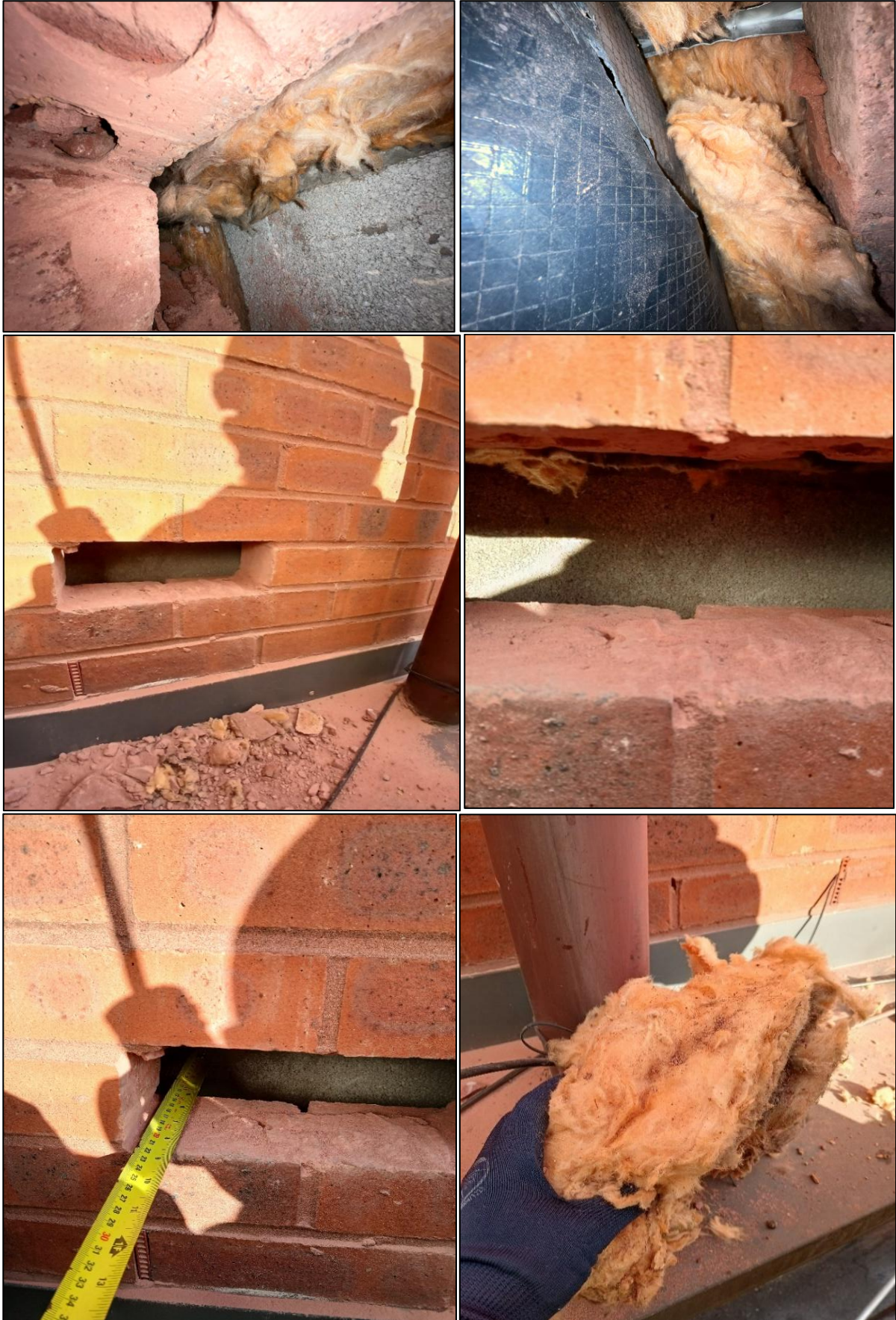
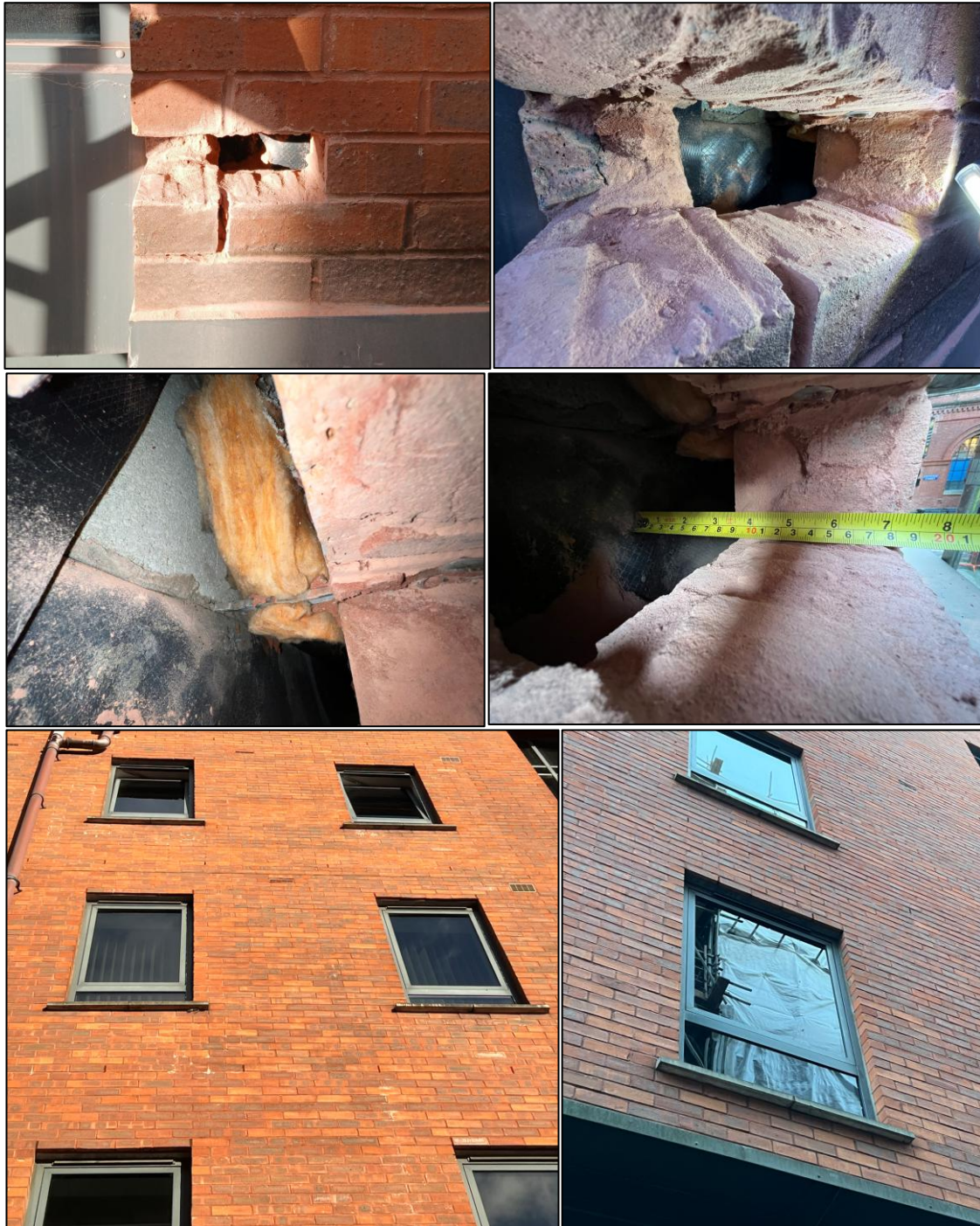


Figure 18 – Diagram 8.2, extracted from ADB 2010.







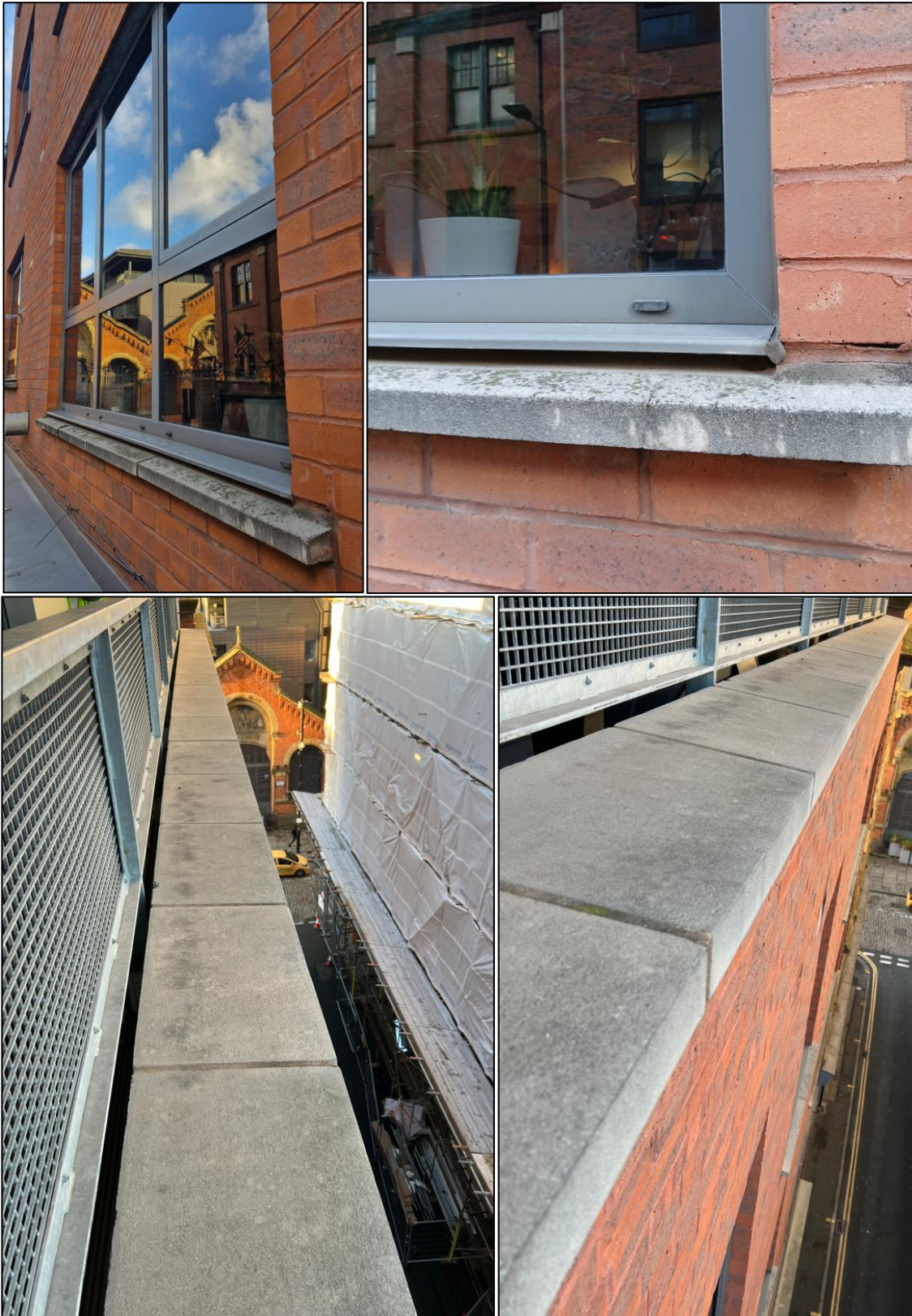


Figure 19 – Typical inspection images for EWT1 taken by Octa Fire.

8.2 External Wall Type 2 – Grey/Blue Terracotta Tiles (EWT2)

EWT2 consists of grey and blue coloured terracotta tiles, which have been installed on front, right side and rear elevations of the building.

The blue coloured tiles are only found on the ground floor, whereas the grey coloured tiles are installed on the upper elevations (from 1st- 4th floor levels).

Based on the areas inspected during our intrusive inspection, it is best understood that EWT2 comprises of the following build-up (stated from external to internal):

- **Circa 10mm thick Terracotta Tiles** – Euroclass A1 non-combustible.
- **Metal Cladding Support Rails** – Euroclass A1 non-combustible;
- **Circa 35-55mm Cavity Void**;
- **Tyvek Breather Membrane** – Assumed to be standard grade and therefore, combustible, unless confirmed otherwise;
- **Circa 100-120mm thick Mineral Wool Insulation Layer** – Euroclass A1 non-combustible; and
- **Blockwork Substrate** – Euroclass A1 non-combustible, a thickness more than 75mm is assumed.

EWT2 is understood to comprise of grey/blue coloured A1 non-combustible terracotta tiles (which are fixed to the building substrate by the aid of metal cladding support rails), followed by a cavity void, Tyvek breather membrane and mineral/glass wool insulation (A1 non-combustible). The substrate behind EWT2 is solid A1 non-combustible blockwork.

Based on the above, it can be concluded that the primary external wall materials within EWT2, with the exception of the thin breather membrane, are of A1 non-combustible nature, which will not add to the fire load or cause rapid fire spread across the facade.

With regards to cavity barrier provisions within EWT2, no proprietary mineral wool-based cavity barriers were observed at any of the inspected locations (i.e., window openings and compartment lines). Nevertheless, it should be noted that the cavity void behind the terracotta tiles comprises of A1 non-combustible insulation material, and as far as we understand it, there are no significant combustible materials within EWT2.

In-addition to above, whilst inspecting EWT2, horizontal steel structures were observed on the building façade at the floor slab levels. The paint applied on the steel structure (unclear if it is intumescent or not) was observed to be peeling off. If the horizontal and vertical steel works (as noted on site) are considered primary structural, loadbearing elements of the building, then they are required to be adequately fire protected to uphold the same level of fire resistance as the element of structure for the building. Review of structural fire performance of the building is currently excluded from our FRAEW scope of works.

Typical inspection images for EWT2 are shown in Fig.20.











Figure 20 – Typical inspection images for EWT2 taken by Octa Fire.

8.3 External Wall Type 3 – Grey Metal Cladding Panel (EWT3)

EWT3 comprises of a grey coloured metal cladding panel (ferrous), which is believed to be installed to a limited area of the building envelope from 1st - 4th floor levels (on concrete/blockwork substrate and divided by windows) on front, right and rear elevations of the building. For further details see Fig.21.

Based on the areas inspected during our intrusive inspection, it is best understood that EWT3 comprises of the following build-up (stated from external to internal):

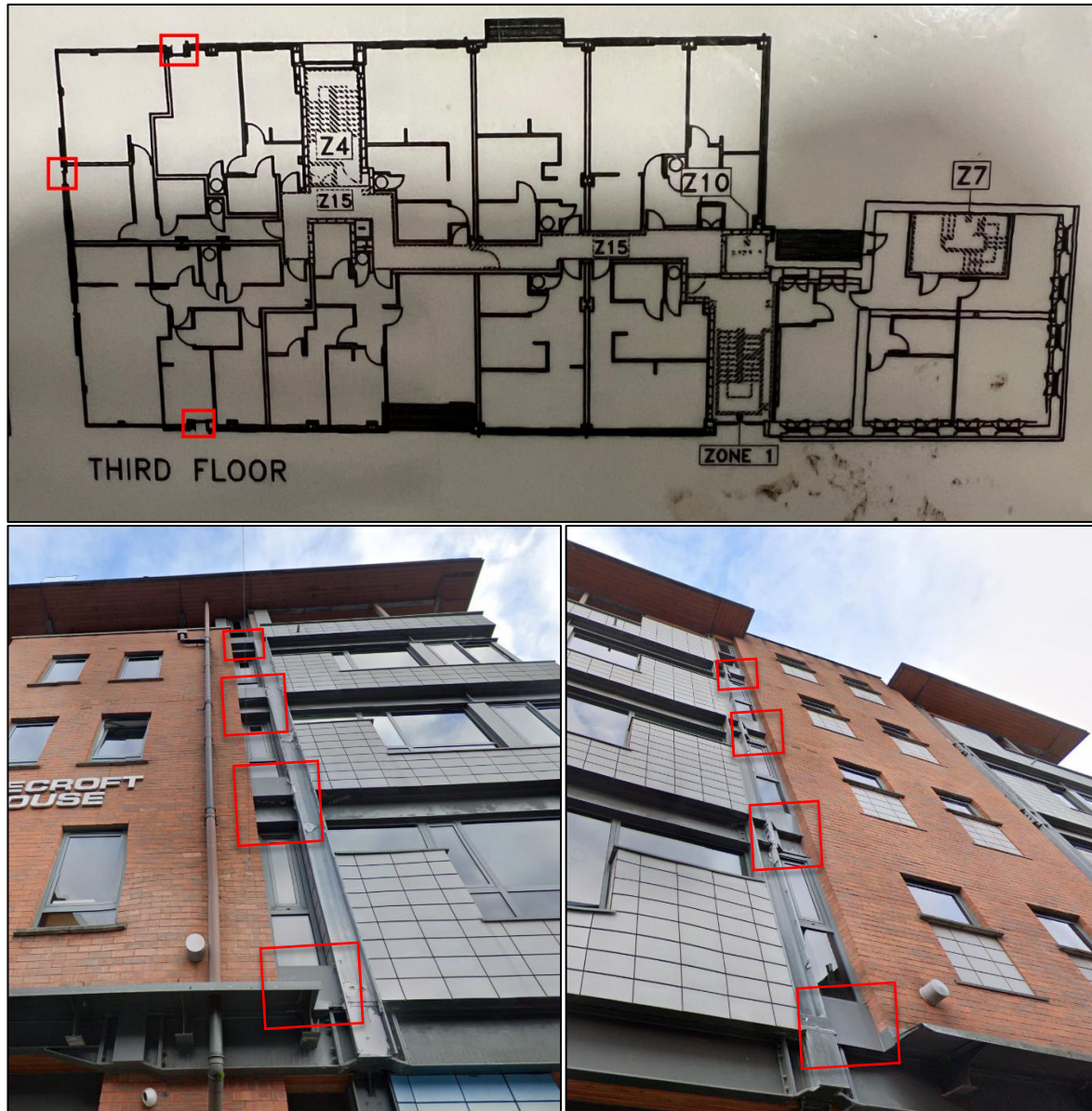
- **Circa 1mm thick PPC Coated Metal Panel (Ferrous)** – Assumed to be A2;
- **Thin Layer of Sarnafil Membrane** - Euroclass E (combustible);
- **Circa 1mm thick Metal Sheet (Ferrous)** - Assumed to be A2 or better; and
- **Concrete Slab/Blockwork Substrate** – Euroclass A1 non-combustible, a thickness more than 75mm is assumed.

EWT3 is understood to comprise of grey coloured PPC coated metal cladding panel (ferrous), followed by a thin layer of Sarnafil membrane (which is understood to be a waterproofing membrane with a Euroclass E reaction to fire classification, see Appendix A), applied to a metal sheet (ferrous). EWT3 is installed directly back to the concrete/blockwork substrate in the absence of a cavity void.

It should be noted that this wall type is only installed to a limited section of the external wall, see Fig.22. In addition to this, EWT3 steps back slightly from the main body of the façade and the adjacent wall types are either EWT1 (brick), EWT2 (terracotta tiles) or vertical steel columns. Based on this, it can be said that the risk of rapid fire spread across the façade causing harm to the building occupant, or causing fire spread to the adjacent external wall types, from the thin layer of combustible Sarnafil membrane is considered to be negligible.

In-addition to above, whilst inspecting EWT3, vertical steel structures were observed on the building façade. The paint applied on the steel structure (unclear if it is intumescent or not) was observed to be peeling off, see Fig.23 for more details. If the horizontal and vertical steel works (as noted on site) are considered primary structural, loadbearing elements of the building, then they are required to be adequately fire protected to uphold the same level of fire resistance as the element of structure for the building. Review of structural fire performance of the building is currently excluded from our FRAEW scope of works.

Typical inspection images of EWT3 are presented in Fig.22.



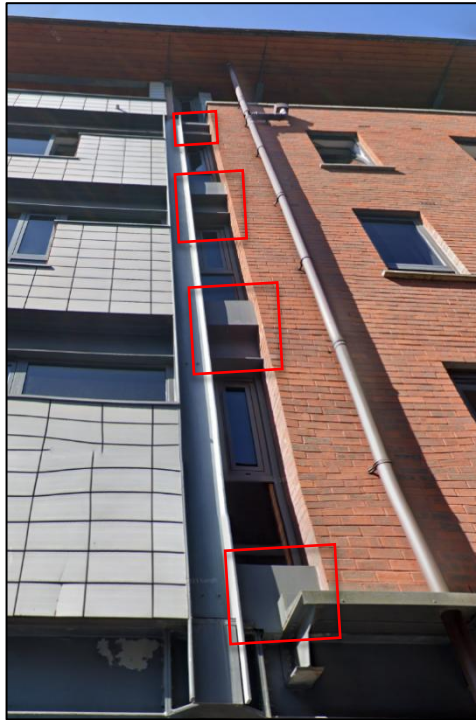


Figure 21 – Grey metal cladding (highlight in red).





Figure 22 – Typical inspection images for EWT3 taken by Octa Fire.



Figure 23 – Typical inspection images of steel structure taken by Octa Fire.

8.4 External Wall Type 4 – Silver ACM Cladding Panels - (EWT4)

EWT4 comprises of a silver coloured ACM cladding panel, which is believed to have been installed on the top 2 floors (4th and 5th floor) of the building on all elevations, see Fig.24.

Based on the areas inspected during our intrusive inspection, it is best understood that EWT4 comprises of the following build-up (stated from external to internal):

- **Circa 4.16mm Silver ACM Cladding Panel** – Assumed to be combustible (Category 3);
- **Metal Cladding Support Rails** – Euroclass A1 non-combustible;

- **Circa 48mm Cavity Void;**
- **Tyvek Breather Membrane** – Assumed to be standard grade and therefore, combustible, unless confirmed otherwise;
- **Circa 100mm thick Mineral Wool Insulation** – Euroclass A1 non-combustible; and
- **Blockwork Substrate** – Euroclass A1 non-combustible, a thickness more than 75mm is assumed.

EWT4 is understood to comprise of a silver coloured ACM cladding panel (which has been fixed back to the building substrate by the aid of metal cladding support rails), followed by a cavity void, Tyvek breather membrane and mineral wool insulation (A1 non-combustible). The substrate behind EWT4 is solid A1 non-combustible blockwork.

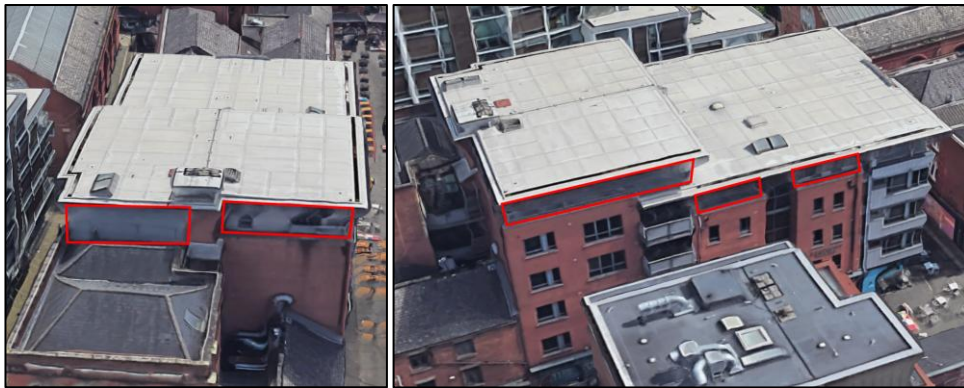
ACM cladding panels are believed to be installed at the vertical compartment lines (between apartments as well as between apartments and the staircase), but not across horizontal compartment lines, given that the ACM clad external wall (on both levels 4 & 5) steps back from the main brick façade of the building (EWT1).

With regards to cavity barrier provisions within EWT4, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected locations.

ACM samples extracted from site (level 5 balcony) have been presented in Appendix B. The ACM panels are assumed to be Category 3 (more than 35MJ/kg when tested in a bomb calorimeter apparatus). Considering we have not been provided with any test data at the time of writing this report by the client, a worst case-scenario assumption has been adopted. However, if the ACM's installed on the building are found to be better than Category 3 (i.e., CAT 1 or 2), this report should be reviewed and updated accordingly.

In-addition to the above, an overhang detail with horizontal timber planks has been installed on the top two floors of the building directly above the ACM clad external walls. This wooden soffit crown detail can present a risk of fire spread.

Typical inspection images of EWT4 are presented in Fig.25.



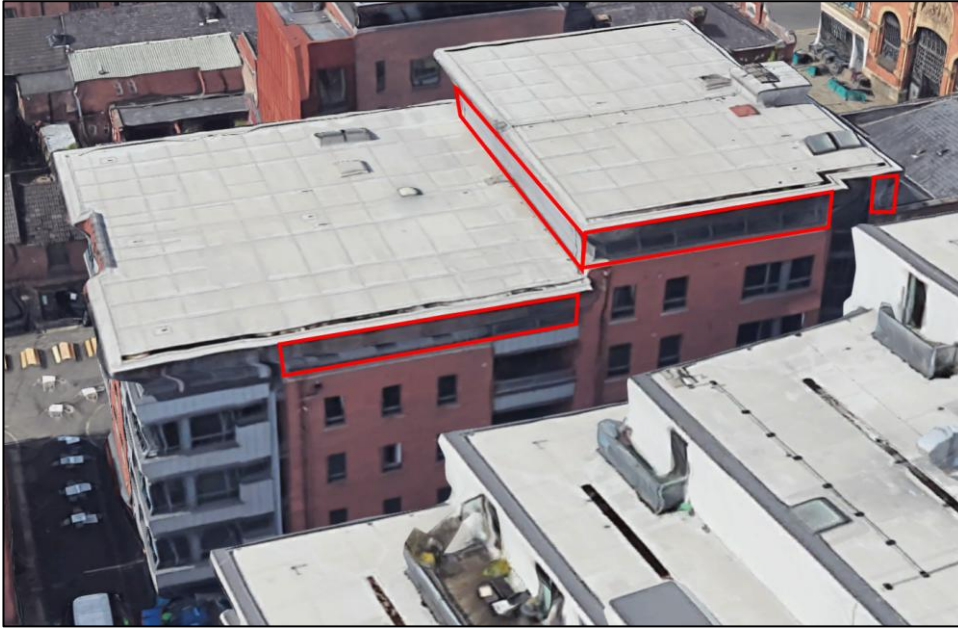


Figure 24 – Areas (highlighted red) where we believe EWT4 to have been installed on the building facade.

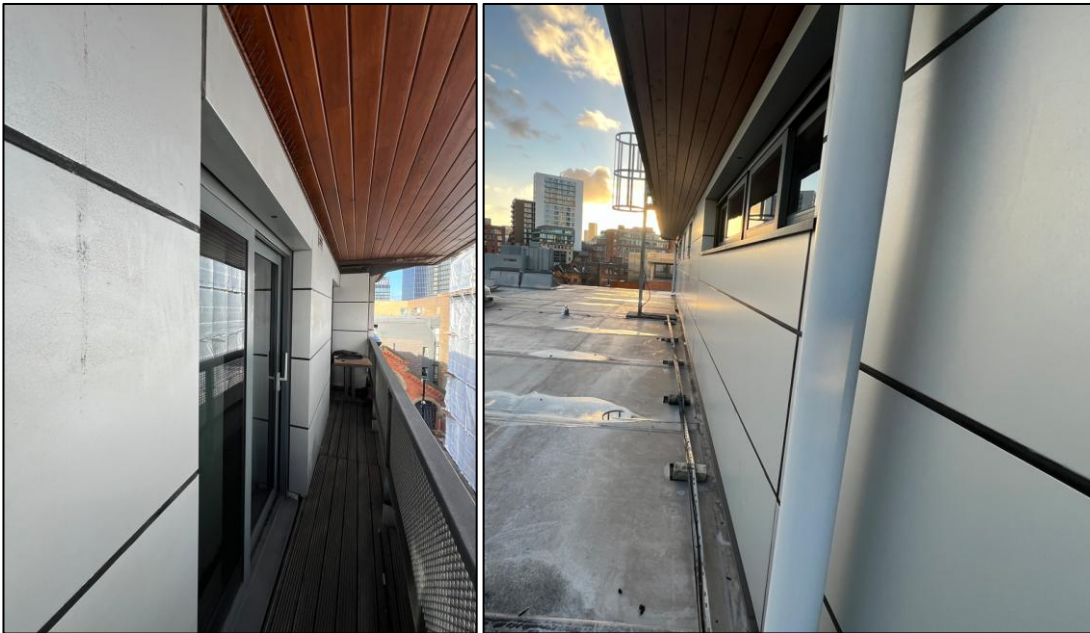






Figure 25 – Typical inspection images for EWT4 taken by Octa Fire.

8.5 External Wall Type 5 – Grey Insulated Metal Window Cladding Panels - (EWT5)

EWT5 comprise of a grey coloured insulated metal cladding panel (non-ferrous) with a pink coloured foam insulation core material. EWT5 is understood to be installed vertically between windows on the front and rear elevations of the building, see Fig.26.

Based on the areas inspected during our intrusive inspection, it is best understood that EWT5 comprises of the following build-up (stated from external to internal):

- **Insulated Metal Window Cladding Panel (outer non-ferrous metal sheet, pink foam insulation core material and inner metal sheet)** - Assumed to be combustible, Euroclass D, unless stated and confirmed otherwise.

EWT5 is installed vertically between windows and to the best of our knowledge and understanding does not span across the compartment lines.

Typical inspection images of EWT5 are presented in Fig.27.

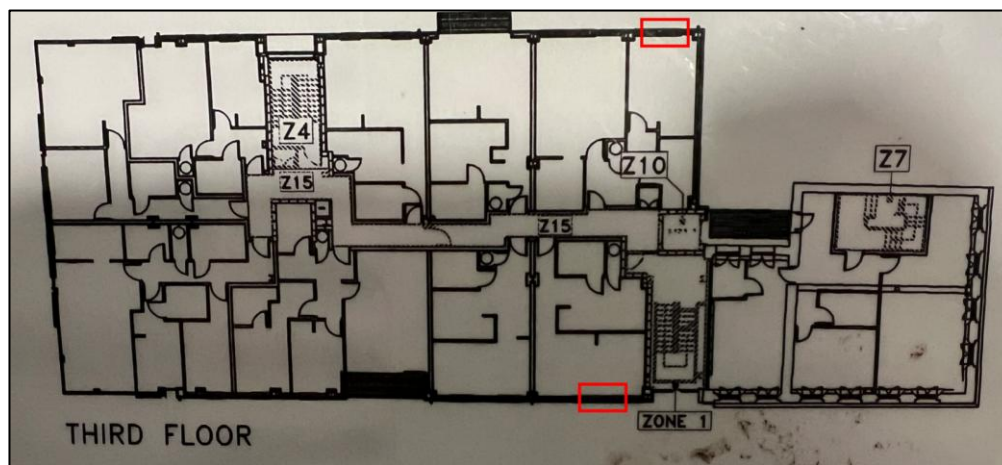


Figure 26 – Areas (highlighted red) where we believe EWT5 to have been installed on the building facade.





Figure 27 – Typical inspection images for EWT5 taken by Octa Fire.

8.6 External Wall Type 6 – Curtain Walling - (EWT6)

EWT6 comprise of a grey coloured metal cladding panel (non-ferrous) which has been installed horizontally as part of the staircase curtain walling system on the front and rear elevations of the building.

Based on the areas inspected (on the ground floor, front elevation, noted as Z4 on the floor plans), it is best understood that EWT6 comprises of the following build-up (stated from external to internal):

- **Non-ferrous Metal Cladding Panel** - Assumed to be Euroclass A2 or better; and
- **Cavity Void with Loosely Positioned Glass/Mineral Wool Insulation** – Euroclass A1 non-combustible.

EWT6 is installed horizontally as part of the staircase curtain walling system. It should be noted that the staircase serves as a single compartment; therefore, generally, under ADB guidance, does not require proprietary cavity barriers at horizontal floor levels, but only vertically between the curtain walling and the adjacent areas, which in this case is mostly EWT1 (brick).

In addition to the above, EWT6 steps back from the main body of the façade. The adjacent wall types on the front staircase (Z4) are EWT1 (brick from ground – 3th floor level) and EWT4 (ACM panels on 4th floor level). The adjacent wall types on the rear staircase (Z1) are EWT1 (brick from ground – 4th floor level) and EWT4 (ACM panels on 5th floor level).

Typical inspection images of EWT5 are presented in Fig.28.

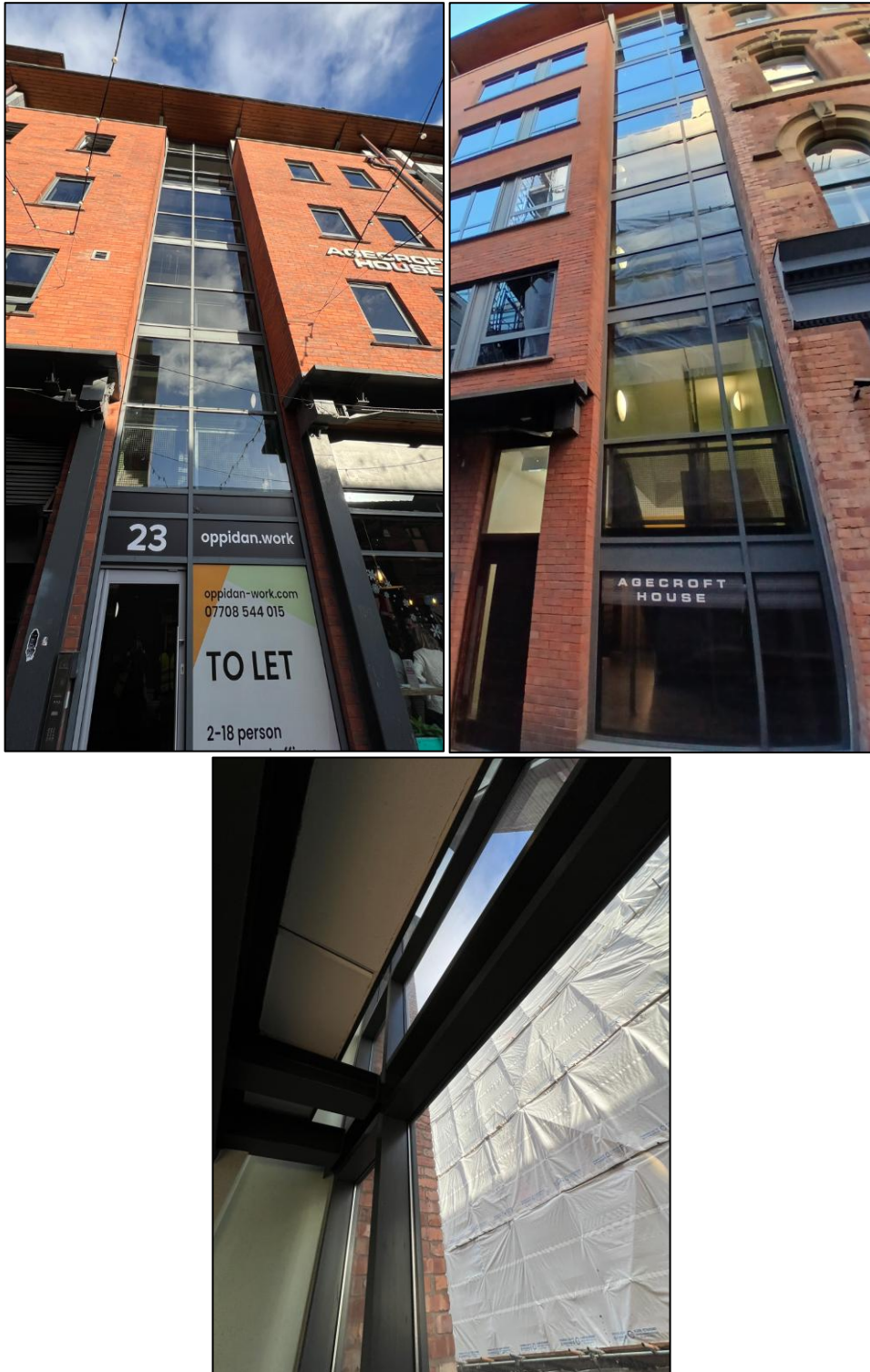




Figure 28 – Typical inspection images for EWT5 taken by Octa Fire.

8.7 External Wall Attachments, Soffits and Overhang Details

Limited to the areas accessed and reviewed during our site inspections, it is best understood that the building comprises of the following attachments.

1. **Metal Bolt on Balconies** – These attachments clearly protrude out, away from the main body of the façade and are located only on one elevation of the building (front). These balconies are designed to serve apartments located on levels 1-4. Limited to a visual, non-intrusive observation, these balconies appear to be constructed of a metal frame with timber planks installed to both the floor decking and the soffit, see Fig.29. The timber planks appear to be installed tightly abutted together with limited gaps in-between, which, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
2. **Recessed Inset Balconies** – This balcony detail is incorporated within the façade and designed to reside recessed back from the main body of the brick façade (EWT1). The inset balconies are located only on one elevation of the building (rear). These balconies are designed to serve apartments located on levels 1-4 and are believed to be an extension of the concrete floor slab (unless confirmed otherwise) with timber planks to both the floor decking and the soffits, see Fig.30. Likewise, as that stated for the metal bolt on balconies, the timber planks are understood to be installed tightly abutted together with limited gaps in-between. This, coupled with a concrete floor slab on to which the timber planks are understood to be installed, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
3. **Terrace/balcony zones** – These areas are understood to be located on the 4th and 5th floor of the building, as shown highlighted red in Fig.31, and understood to comprise of timber decking installed over the concrete floor slab.
4. **Metal Roof Overhang Detail** – This detail is located on top two floors of the building (levels 4 and 5) and understood to be constructed of metal and clad with horizontal timber plank, see Fig.32.

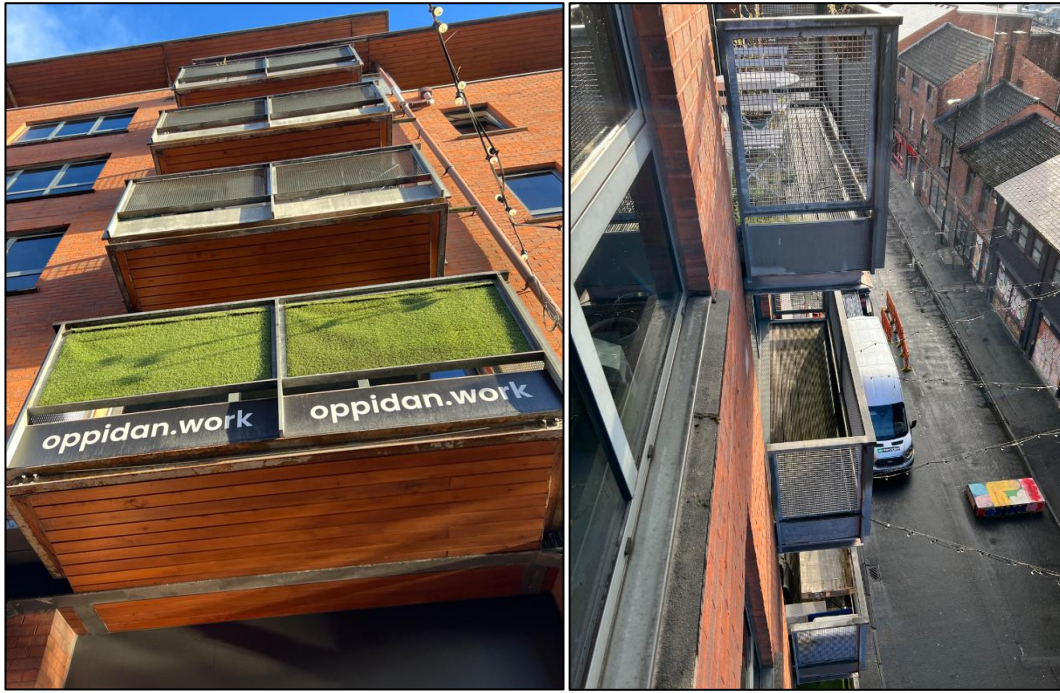


Figure 29 – Protruding out balconies on front elevation, images taken by Octa Fire.

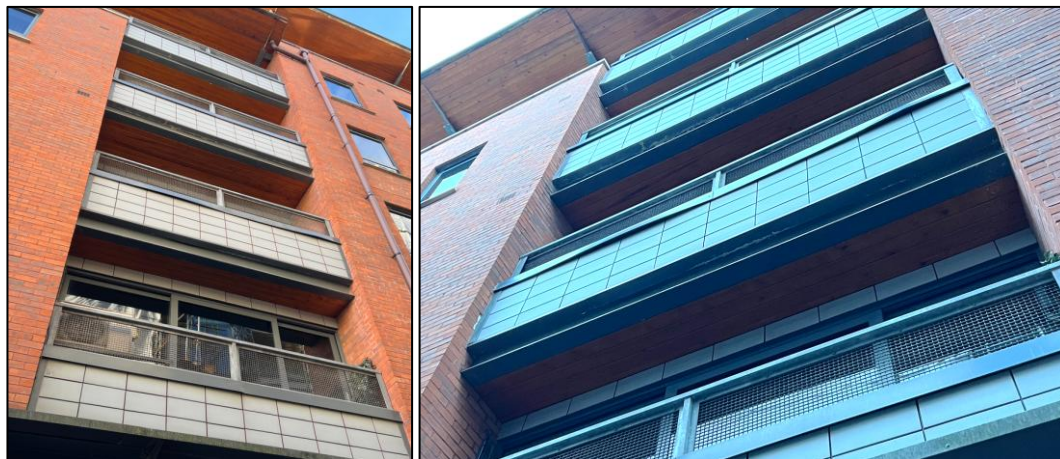


Figure 30 – Recessed inset balconies on rear elevation, images taken by Octa Fire.

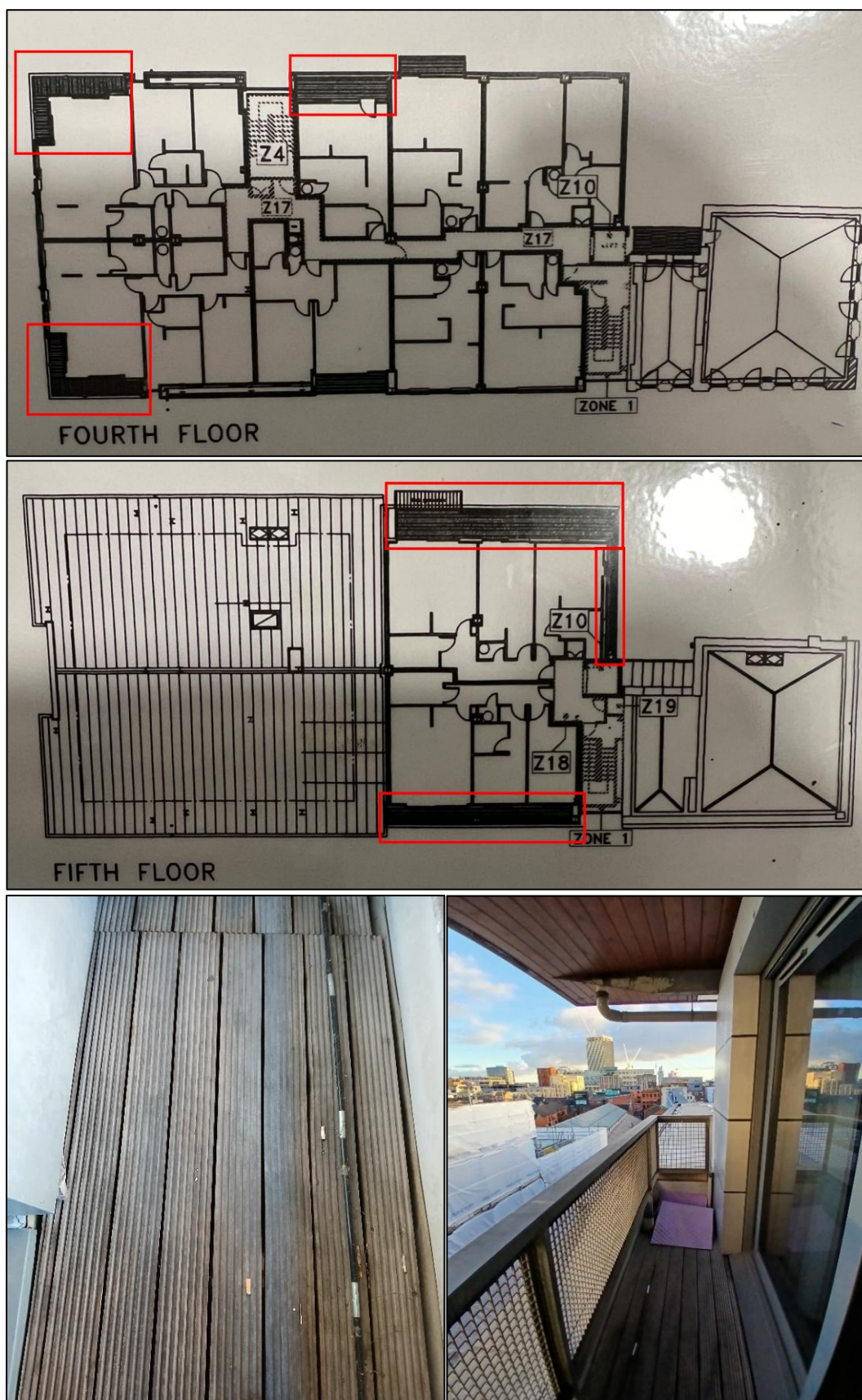


Figure 31 – Balcony/terraced area on 4th and 5th floor level, images taken by Octa Fire.

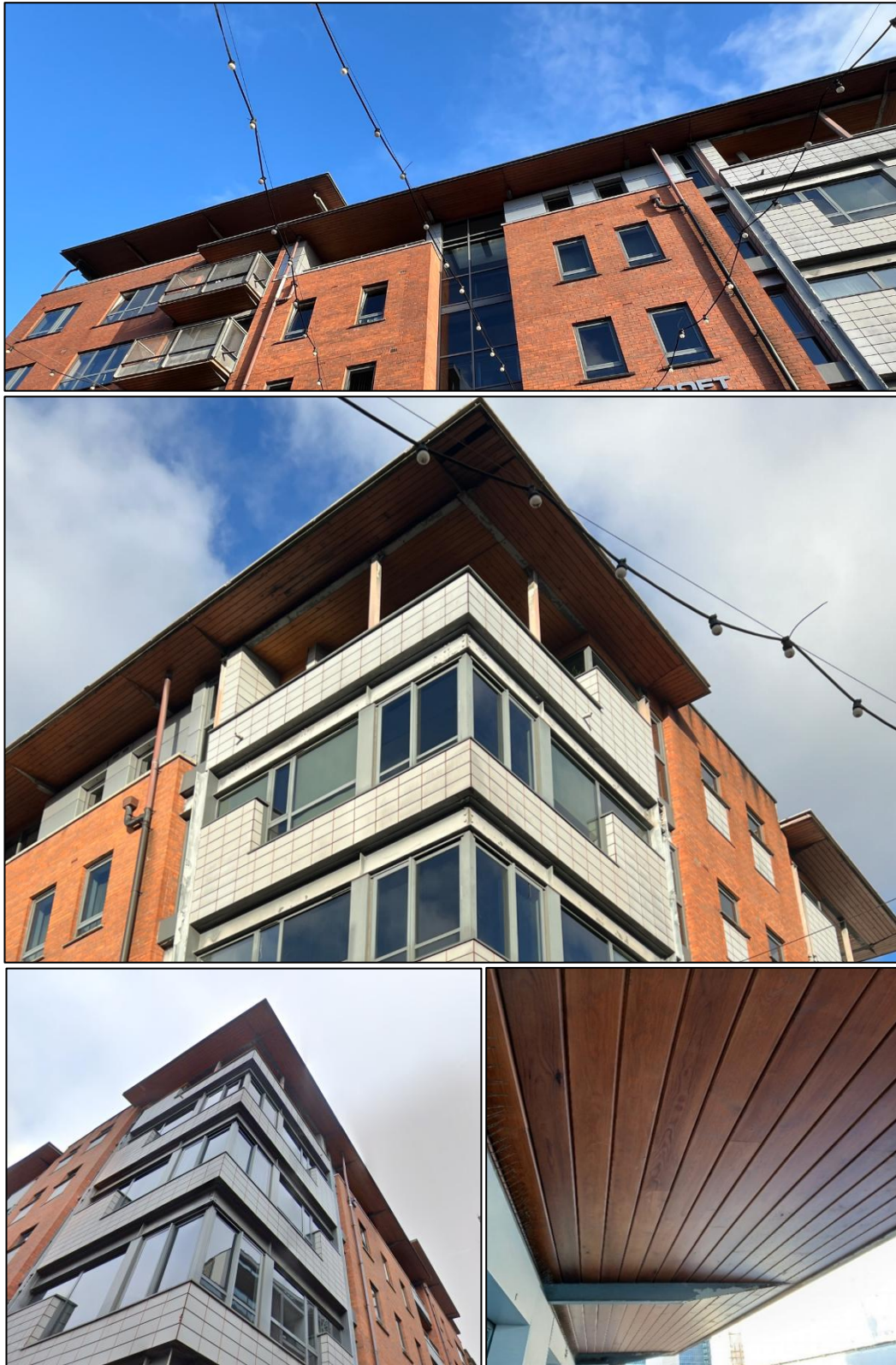


Figure 32 – Metal roof overhang detail, images taken by Octa Fire.

8.8 Summary

EWT1 comprises of masonry facing brick façade, which covers majority of the building envelope and has been installed from ground to 4th floor of the building on all elevations. It is best understood that EWT1 solely consists of non-combustible materials (A1) within its build-up (brick and blockwork with mineral/glass wool insulation) with the exception of the thin EPDM membrane (which was only found at the inspected horizontal floor slab level), given the low combustible mass of the external wall materials within this wall type, it is our view that this will significantly reduce the risk of fire spread up and across the building envelope. With regards to cavity barrier provisions within EWT1, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas (i.e., compartment lines, window openings and vent penetration). However, given that EWT1 is believed to comply with all the parameters put forward within Diagram 8.2 of the current ADB and Diagram 32 of the old ADB, (i.e., two leaves of brick or concrete assuming each at least 75mm thick, cavities are closed around opening to limit air infiltration and the cavity at the top of the external wall is also closed off), based on this, it can be concluded that cavity barriers are not required for this external wall system and the likelihood of fire spreading through this façade system is low.

EWT2 comprises of grey and blue coloured terracotta tiles, which have been installed from ground - 4th floor level on front, right side and rear elevations of the building. It is best understood that EWT2 primarily comprises of A1 non-combustible materials (outer terracotta tiles and blockwork substrate with mineral wool insulation), with the exception of the thin breather membrane, given the low combustible mass of the external wall materials within this wall type, it is our view that this will significantly reduce the risk of fire spread up and across the building envelope. With regards to cavity barrier provisions within EWT2, no proprietary mineral wool-based cavity barriers were observed at any of the inspected locations (i.e., window openings and compartment lines). In-addition to this, whilst inspecting EWT2, horizontal steel structures were observed on the building façade at the floor slab levels, which creates a divide between the terracotta system, and also present vertically, which is understood to create a divide between EWT2 and EWT1. The paint applied on the steel structure (unclear if it is intumescent or not) was observed to be peeling off. It should be noted that if the horizontal and vertical steel works (as noted on site) are considered primary structural, loadbearing elements of the building, then they are required to be adequately fire protected to uphold the same level of fire resistance as the element of structure for the building. Review of structural fire performance of the building is currently excluded from our FRAEW scope of works.

EWT3 comprises of a grey coloured metal cladding panel (ferrous), which is believed to be installed to a limited area of the building envelope from 1st - 4th floor level (on concrete/blockwork substrate and divided by windows) on front, right and rear elevations of the building. Wall build-up for EWT3 is understood to comprise of grey coloured PPC coated metal cladding panel (ferrous), followed by a thin layer of Sarnafil membrane (which is understood to be a waterproofing membrane with a Euroclass E reaction to fire classification), applied to a metal sheet (ferrous). EWT3 is installed directly back to the concrete/blockwork substrate in the absence of a cavity void. In addition to this, it should be noted that EWT3 steps back from the main body of the façade and the adjacent wall types are either EWT1 (brick), EWT2 (terracotta tiles) or vertical steel columns. Based on this, it can be said that the risk of rapid fire spread across the façade causing harm to the building occupant, or causing fire spread to the adjacent external wall types, from the thin layer of combustible Sarnafil membrane is considered to be negligible.

EWT4 comprises of a silver-coloured ACM cladding panel (assumed to be Category 3), which is believed to have been installed on the top 2 floors (4th and 5th floor) of the building on all elevations. Wall build-up for EWT4 is understood to comprise of a silver-coloured ACM cladding panel (which has been fixed back to the building substrate by the aid of metal cladding support rails), followed by a cavity void, Tyvek breather membrane and mineral wool insulation (A1 non-combustible). The substrate behind EWT4 was inspected to be solid A1 non-combustible blockwork. With regards to cavity barrier provisions within EWT4, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected locations.

EWT5 comprise of a grey coloured insulated metal cladding panel (non-ferrous) with a pink coloured foam insulation core material. EWT5 is understood to be installed vertically between windows (on the front and rear elevations) and to the best of our knowledge and understanding, EWT5 is installed within the same compartment and does not span across the compartment lines.

EWT6 comprise of a grey coloured metal cladding panel (non-ferrous), which has been installed horizontally as part of the staircase curtain walling system on the front and rear elevations of the building (on both the staircases). With

regards to cavity barrier provisions within EWT6, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas, however, it should be noted that given that the staircase serves as a single compartment; and therefore, generally, under ADB guidance, does not require proprietary cavity barriers at horizontal floor levels, but only vertically between the curtain walling and the adjacent areas, which in this case is mostly EWT1 (brick).

With regards to external wall attachments, limited to the areas accessed and reviewed during our site inspections, it is best understood that the building comprises of the following attachments.

1. **Metal Bolt on Balconies** – These attachments clearly protrude out, away from the main body of the façade and are located only on one elevation of the building (front). These balconies are designed to serve apartments located on levels 1-4. Limited to a visual, non-intrusive observation, these balconies appear to be constructed of a metal frame with timber planks installed to both the floor decking and the soffit, see Fig.29. The timber planks appear to be installed tightly abutted together with limited gaps in-between, which, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
2. **Recessed Inset Balconies** – This balcony detail is incorporated within the façade and designed to reside recessed back from the main body of the brick façade (EWT1). The inset balconies are located only on one elevation of the building (rear). These balconies are designed to serve apartments located on levels 1-4 and are believed to be an extension of the concrete floor slab (unless confirmed otherwise) with timber planks to both the floor decking and the soffits, see Fig.30. Likewise, as that stated for the metal bolt on balconies, the timber planks are understood to be installed tightly abutted together with limited gaps in-between. This, coupled with a concrete floor slab on to which the timber planks are understood to be installed, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
3. **Terrace/balcony zones** – These areas are understood to be located on the 4th and 5th floor of the building, as shown highlighted red in Fig.31, and understood to comprise of timber decking installed over the concrete floor slab.
4. **Metal Roof Overhang Detail** – This detail is located on top two floors of the building (levels 4 and 5) and understood to be constructed of metal and clad with horizontal timber plank, see Fig.32.

Regarding **STEP 1**, based on the details presented for the six external wall types, a basic level assessment FRAEW is considered to be needed for the building to understand the risk of external fire spread and its influence on the building occupants' safety.

Section 5, 6, 7 and 8 in this report provide the details and information gathering as required in **STEP 2**.

9.0 FIRE RISK APPRAISAL

Based on the PAS9980:2022, a five-step approach to the basic level of assessment should be considered as presented in Fig.33. After the review process of Steps 1 and 2 in PAS9980:2022, Agecroft House will require a full FRAEW assessment.

STEPS 1 and 2 are already presented in previous sections.

STEPS 3, 4 and 5 are presented in this section.

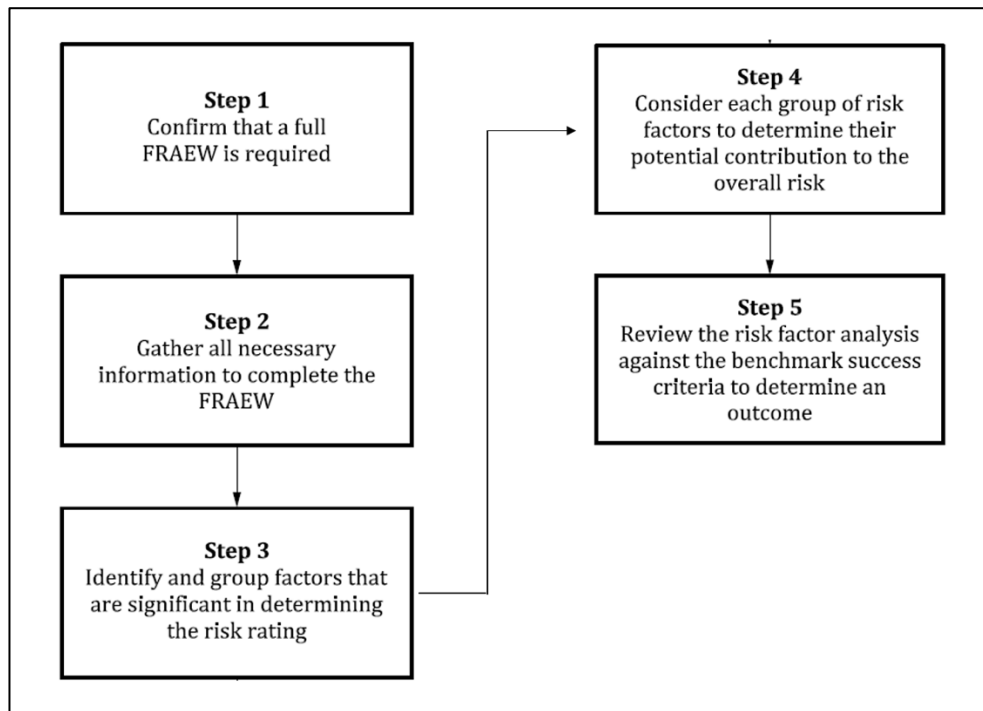


Figure 33 - Five-step approach to the basic level of assessment for FRAEW based on PAS9980:2022

The assessor will need to assign an approximate risk rating to each predefined risk factor in accordance with the PAS9980 methodology to arrive at an overall risk rating. According to PAS9980, three principal areas of the external wall will be examined, each with specific factors for consideration. Below is an excerpt of the risk factors for each area for reference:

Fire Performance Risk Factors (Refer to Annex K of the PAS9980)

- K1 General
- K.2 External surfaces; reaction to fire classes
- K.3 Facing/ cladding panels
- K.4 Panel construction
- K.5 Cavities
- K.6 Insulation
- K.7 Substrate
- K.8 Sheathing boards
- K.9 Insulated core panels
- K.10 ETICS
- K.11 Infill/ spandrel panels
- K.12 Internal finishes

Façade Configuration Risk Factors (Refer to Annex N of PAS9980)

- N.1 Building Height
- N.2 Height of base of cladding above ground
- N.3 Extent of cladding
- N.4 Cavities
- N.5 Infill/ spandrel panels
- N.6 Setbacks
- N.7 Overhangs and projections
- N.8 Proximity to windows and other openings to the accommodation
- N.9 Present of vents or other openings for services in the facade

- N.10 Proximity of combustion elements of a façade to escape route windows and other openings
- N.11 Attachments
- N.12 Proximity of combustible elements of a façade to a neighbouring building

Fire Strategy Risk Factors (Refer to Annex F of PAS9980)

- F.1 Occupancy
- F.2 Evacuation strategy
- F.3 Escape route design
- F.4 Compartmentation
- F.5 Smoke control
- F.6 Fire detection and fire alarm system
- F.7 Fire suppression
- F.8 Firefighting facilities
- F.9 Rising mains
- F.10 Lift for use by firefighters
- F.11 Specific fire hazards

Based on the survey findings and other available information, the assessor will assign a risk-proportionate weighting (Positive, Neutral, or Negative) to the risk factors in each area, in accordance with the possible outcomes of each assessment. Fig.34 illustrates the potential outcomes of the risk factors under PAS9980.

The final step in the FRAEW assessment involves consolidating the findings for each area and placing them on a risk scale ranging from 'high' to 'low' to determine the overall risk position. As referenced in PAS9980, the baseline for the highest risk of external fire spread corresponds to the extremely rapid-fire spread observed in the Grenfell Tower incident, which involved similar metal cladding systems with metal composite material, particularly Category 3 ACM. On the other hand, the lowest risk is associated with brick or masonry inner and outer layers with a minimum thickness of 75mm, along with mineral wool insulation and cavity barriers around openings. Fig.35 provides an illustration of the risk scale and an example of an assessment with a low risk.

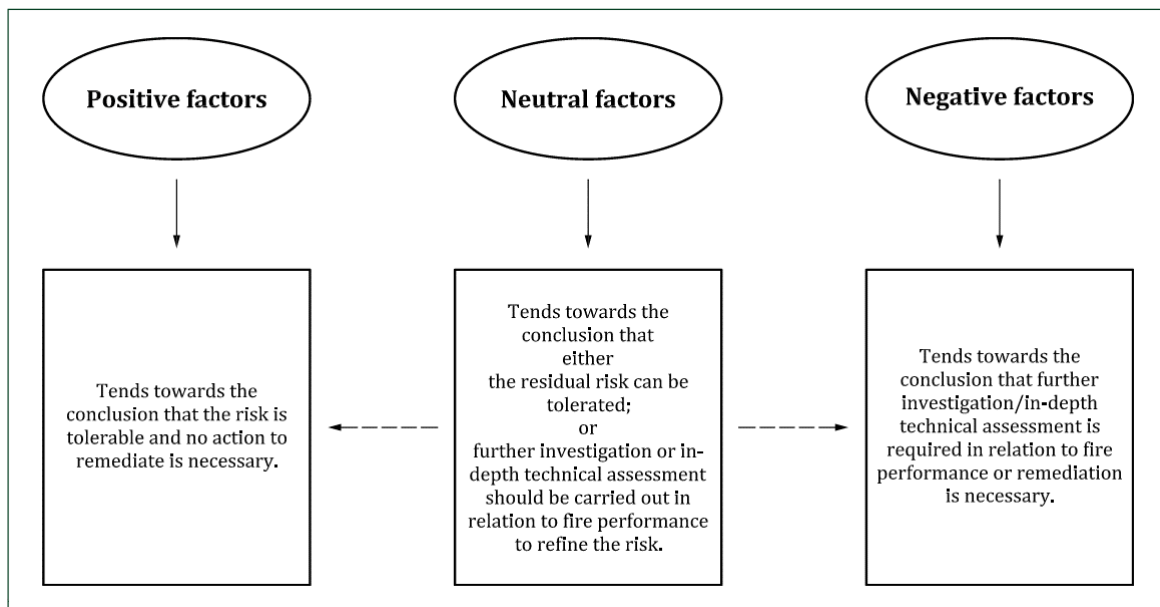


Figure 34 - Potential outcome of the risk factor weighting.

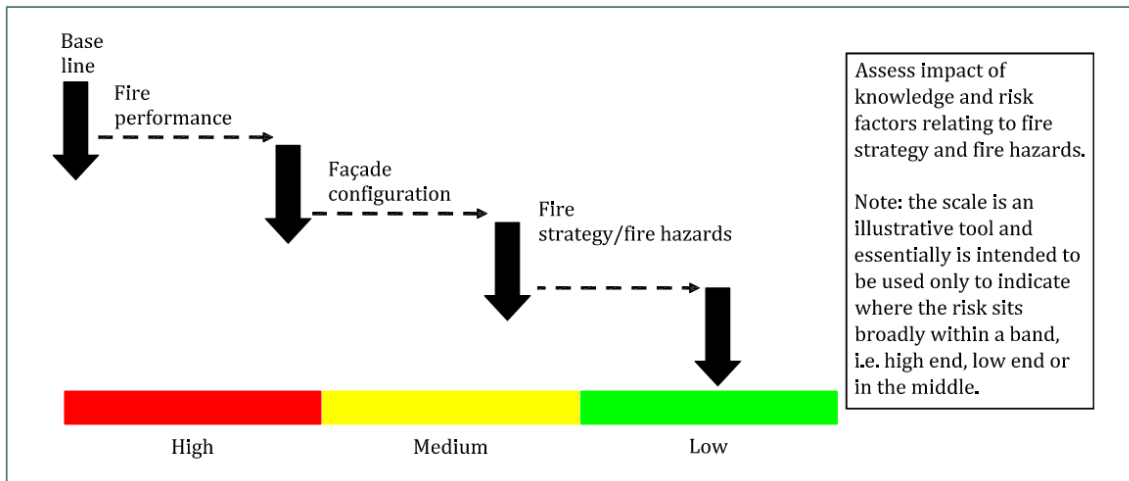


Figure 35 - Illustration of risk factors' influence base on PAS9980:2022 (an example of low risk).

9.1 Fire Performance Risk Factors

Table 2: Fire performance risk factors – EWT1 – Traditional Brick Façade

Risk factors	Observation	Positive	Neutral	Negative
K.1 - General (Calorific value of materials used)	<ul style="list-style-type: none"> • Circa 100mm thick Outer Brick - Euroclass A1 non-combustible; • Mineral/Glass wool insulation within the Cavity - Euroclass A1 non-combustible; • Black EPDM Membrane (noted at the inspected floor level) - Unknown, assumed to be combustible; and • Blockwork Substrate – Euroclass A1 non-combustible, a thickness more than 75mm is assumed. <p>Overall <3MJ/kg</p> <p>Each individual components could be assumed their classification to BS EN 13501-1.</p>			
K.2 - External surfaces; reaction to fire classes	Brick is Euroclass A1 non-combustible and therefore presents low risk for fire spread.			
K.3 - Facings/cladding panels	<p>Low heat release rate.</p> <p>The brick system is understood to be mechanically fixed into position (using wall ties).</p> <p>The outer face of the external wall system is a solid 100mm thick, A1 non-combustible brick.</p>			
K.4 - Panel construction	There are no gaps between the brick.			
K.5 - Cavities	<p>Miner/glass wool insulation within the EW cavity void.</p> <p>The materials facing into the cavity are A1 non-combustible (i.e., brick and mineral/glass wool insulation).</p> <p>No cavity barriers observed within the EWT1, however, cavity closures are understood to be expected around openings.</p>			

K.6 - Insulation	Mineral/Glass wool insulation within the Cavity - Euroclass A1 non-combustible			
K.7 - Substrate	Blockwork			
K.8 - Sheathing boards	N/A			
K.9 - Insulated core panels	N/A			
K.10 - External Thermal Insulation Composite System (ETICS)	N/A			
K.11 - Infill/span-drel panels	N/A			
K.12 - Internal finishes	N/A			

By considering the fire performance risk factors for EWT1, the risk moves to **LOW**. Therefore, no further assessment is considered in this FRAEW report for this external wall according to PAS9980:2022.

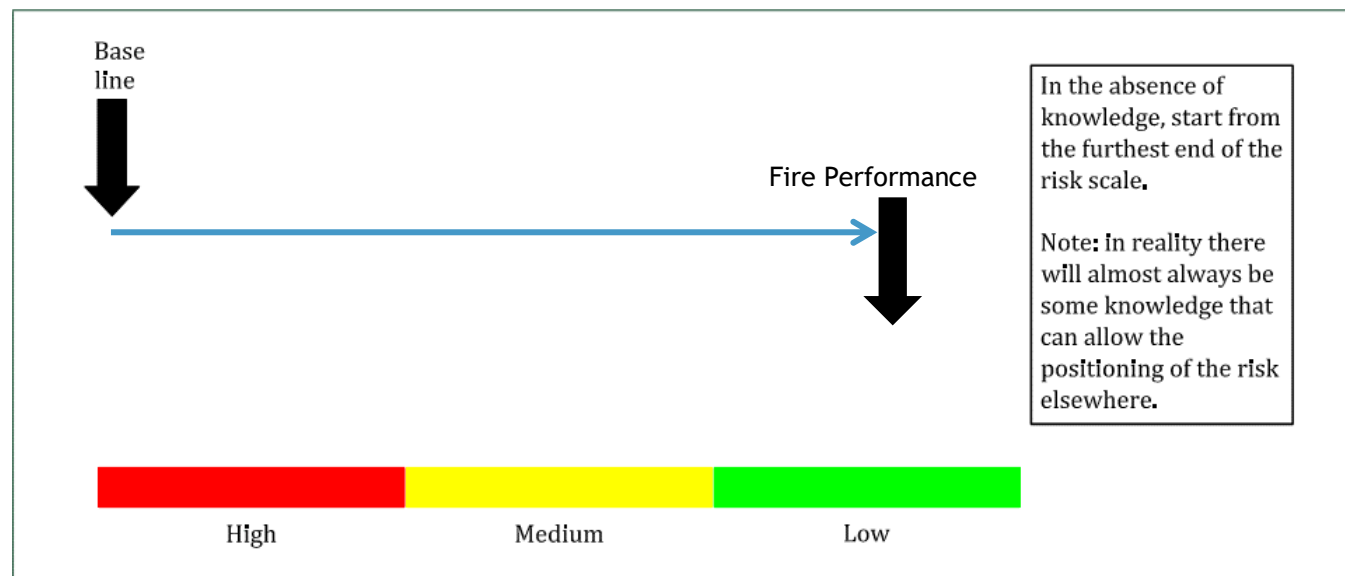
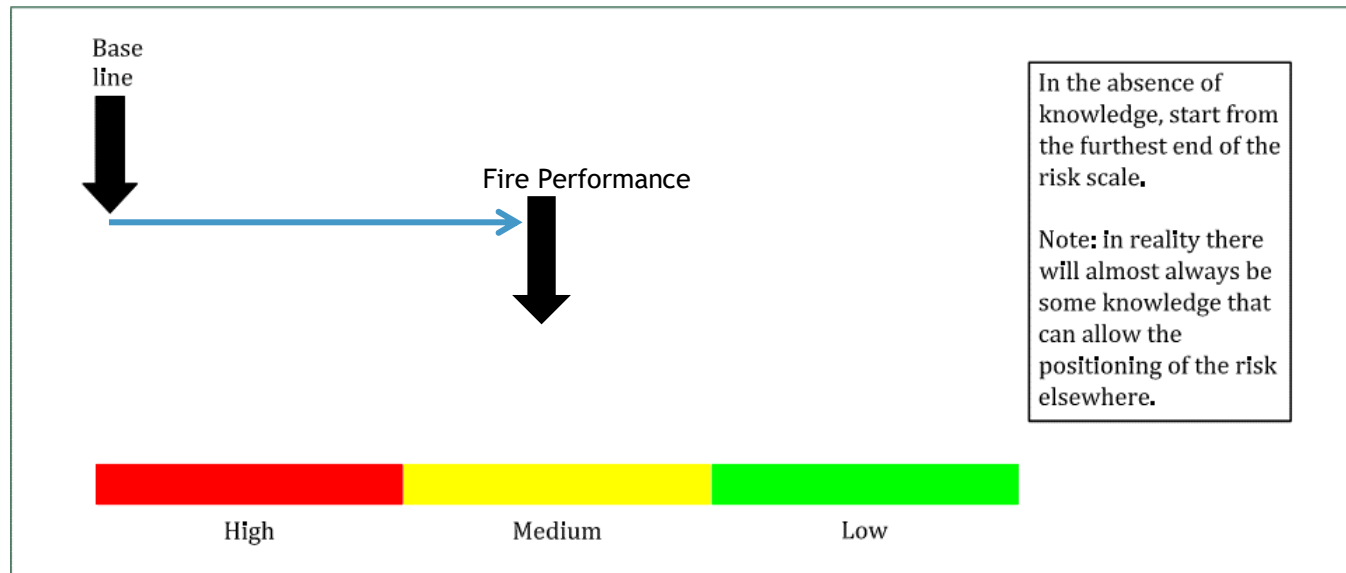


Table 3: Fire performance risk factors – EWT2 – Grey/Blue Terracotta Tiles

Risk factors	Observation	Positive	Neutral	Negative
K.1 - General (Calorific value of materials used)	<ul style="list-style-type: none"> • Circa 10mm thick Terracotta Tiles – Euroclass A1 non-combustible. • Metal Cladding Support Rails – Euroclass A1 non-combustible; • Circa 35-55mm Cavity Void; • Tyvek Breather Membrane – Assumed to be standard grade and therefore, combustible, unless confirmed otherwise; • Circa 100-120mm thick Mineral Wool Insulation Layer – Euroclass A1 non-combustible; and • Blockwork Substrate – Euroclass A1 non-combustible, a thickness more than 75mm is assumed. <p>Overall: <3 MJ/kg</p> <p>Each individual components could be assumed their classification to BS EN 13501-1.</p>			
K.2 - External surfaces; reaction to fire classes	<p>Low Heat Release Rate.</p> <p>Terracotta tiles - Euroclass A1 non-combustible.</p>			
K.3 - Facings/cladding panels	The outer face of the external wall system comprises of terracotta tiles, which is Euroclass A1 non-combustible.			
K.4 - Panel construction	There are gaps (circa 5mm).			
K.5 - Cavities	<p>There is a cavity void.</p> <p>The materials facing into the cavity are Terracotta tiles (A1 non-combustible) and Tyvek breather membrane (assumed to be standard grade and therefore, combustible, unless confirmed otherwise).</p> <p>No cavity barriers found within this wall type. However, the cavity around the opening is expected to be closed off.</p>			

	<p>There are gaps between terracotta tiles, which makes it highly ventilated cavity zone.</p> <p>The overall influence for this risk factor is considered to be neutral.</p>			
K.6 - Insulation	Mineral Wool Insulation Layer – Euroclass A1 non-combustible			
K.7 - Substrate	Blockwork			
K.8 - Sheathing boards	N/A			
K.9 - Insulated core panels	N/A			
K.10 - External Thermal Insulation Composite System (ETICS)	N/A			
K.11 - Infill/spandrel panels	N/A			
K.12 - Internal finishes	N/A			

By considering the fire performance risk factors for EWT2, the risk moves to **MEDIUM**.

**Table 4: Fire performance risk factors – EWT3 – Grey Metal Cladding Panel**

Risk factors	Observation	Positive	Neutral	Negative
K.1 - General (Calorific value of materials used)	<ul style="list-style-type: none"> Circa 1mm thick PPC Coated Metal Panel (Ferrous) – Assumed to be A2, unless confirmed otherwise; Thin Layer of Sarnafil Membrane - Euroclass E (combustible); Circa 1mm thick Metal Sheet (Ferrous) - Assumed to be A2 or better, unless confirmed otherwise; and Concrete Slab/Blockwork Substrate – Euroclass A1 non-combustible. <p>Overall: <3 MJ/kg</p> <p>Each individual components could be assumed their classification to BS EN 13501-1.</p>			
K.2 - External surfaces; reaction to fire classes	Circa 1mm thick PPC Coated Metal Panel (Ferrous) – Assumed to be A2, unless confirmed otherwise			

	Limited in extent in relation to the entire building envelope.			
K.3 - Facings/cladding panels	<p>Low Heat Release Rate</p> <p>The outer face of the external wall system is PPC coated metal panel (ferrous), which is assumed to be Euroclass A2, unless confirmed otherwise</p>			
K.4 - Panel construction	No gaps.			
K.5 - Cavities	<p>No cavity void.</p> <p>The materials facing into the cavity are non-combustible i.e., concrete/blockwork and metal sheet.</p>			
K.6 - Insulation	N/A			
K.7 - Substrate	Concrete/Blockwork			
K.8 - Sheathing boards	N/A			
K.9 - Insulated core panels	N/A			
K.10 - External Thermal Insulation Composite System (ETICS)	N/A			
K.11 - Infill/span-drel panels	<p>A thin layer of Sarnafil membrane (Euroclass E, combustible) was found at the back of the metal sheet (ferrous) - Assumed to be A2 or better.</p> <p>This is installed to a limited area/section of the building façade.</p>			
K.12 - Internal finishes	N/A			

By considering the fire performance risk factors for EWT3, the risk moves to **LOW**. Therefore, no further assessment is considered in this FRAEW report for this external wall according to PAS9980:2022.

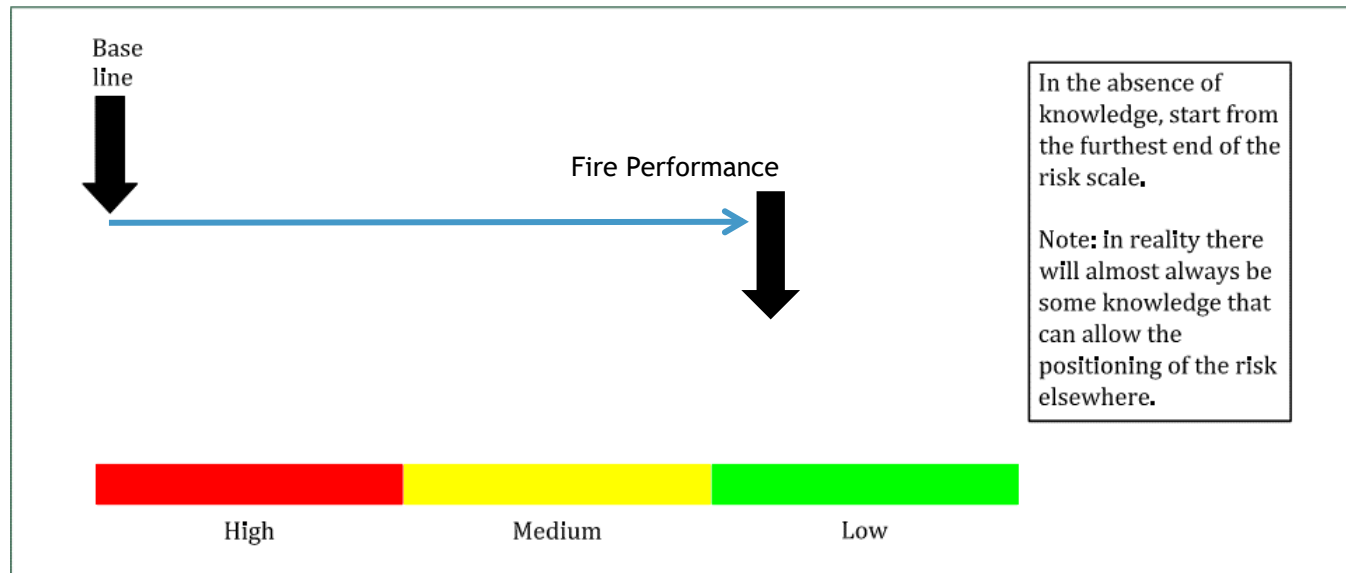


Table 5: Fire performance risk factors – EWT4 – Silver ACM Cladding Panel

Risk factors	Observation	Positive	Neutral	Negative
K.1 - General (Calorific value of materials used)	<ul style="list-style-type: none"> • Circa 4.16mm thick Silver ACM Cladding Panel – Assumed to be combustible, Category 3 is assumed here; • Metal Cladding Support Rails – Euroclass A1 non-combustible; • Circa 48mm Cavity Void; • Tyvek Breather Membrane – Assumed to be standard grade and therefore, combustible, unless confirmed otherwise; • Circa 100mm thick Mineral Wool Insulation – Euroclass A1 non-combustible; and • Blockwork Substrate – Euroclass A1 non-combustible, a thickness more than 75mm is assumed. <p>Overall: >35 MJ/kg.</p>			

K.2 - External surfaces; reaction to fire classes	Circa 4.16mm thick Silver ACM Cladding Panel – Assumed to be combustible, unless confirmed otherwise			
K.3 - Facings/cladding panels	High Heat Release Rate The outer face of the external wall system is ACM panel (assumed to be combustible, unless confirmed otherwise).			
K.4 - Panel construction	No gaps between the ACM panels, however, there is a ventilation and drainage gaps at the head and the base of the ACM clad external wall. Panels have been fixed back to the building substrate by the aid of metal cladding support rails.			
K.5 - Cavities	There is a cavity void within EWT4. The materials facing into the cavity are ACM panel (combustible, CAT 3), metal cladding support rails (Euroclass A1 non-combustible) and Tyvek breather membrane (assumed to be standard grade and therefore, combustible, unless confirmed otherwise). No cavity barriers found within this wall type at areas inspected.			
K.6 - Insulation	Mineral Wool Insulation – Euroclass A1 non-combustible			
K.7 - Substrate	Blockwork.			
K.8 - Sheathing boards	N/A			
K.9 - Insulated core panels	N/A			
K.10 - External Thermal Insulation Composite System (ETICS)	N/A			
K.11 - Infill/span-drel panels	N/A			
K.12 - Internal finishes	N/A			

By considering the fire performance risk factors for EWT4, the risk remains at **HIGH**.

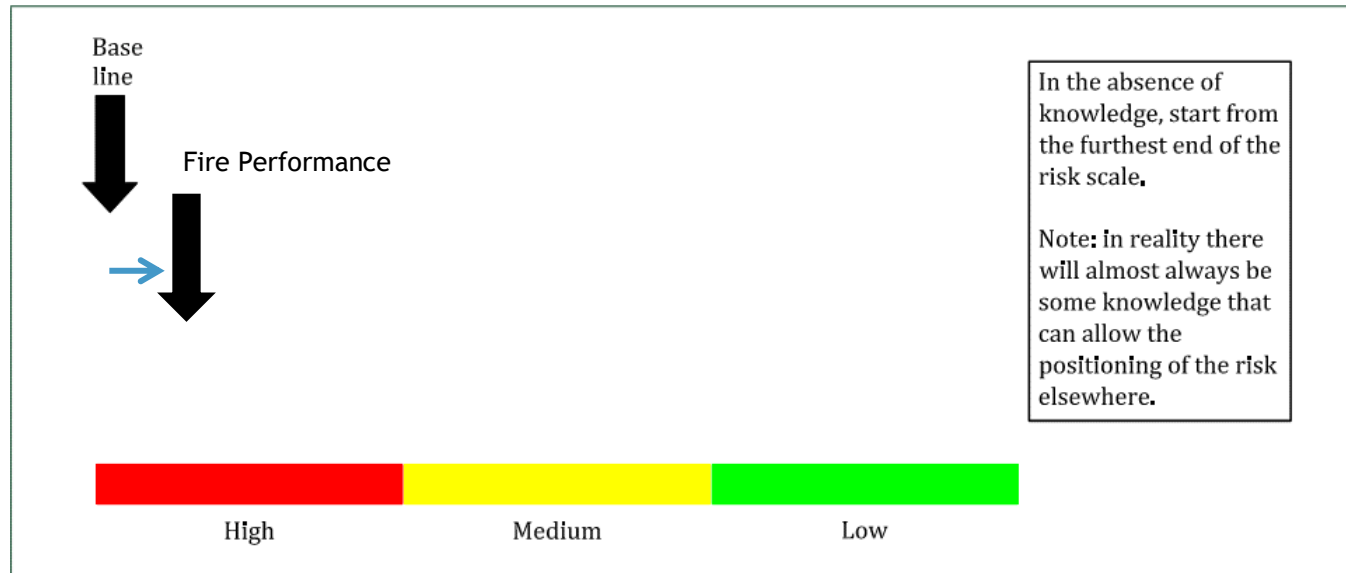
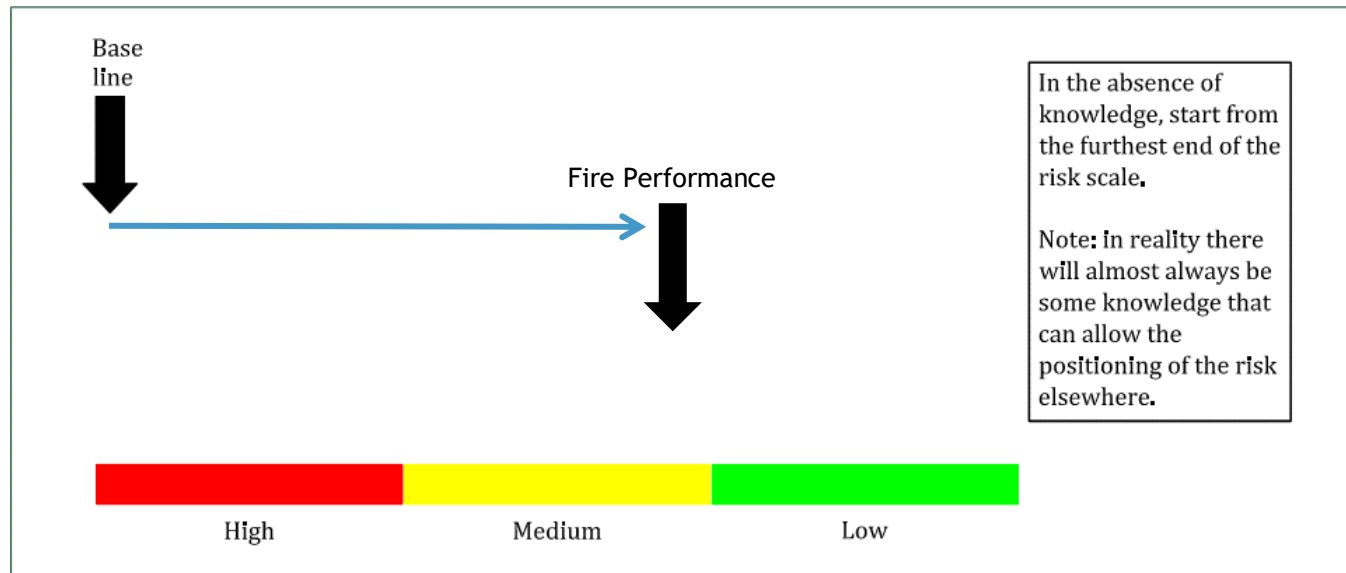


Table 6: Fire performance risk factors – EWT5 – Grey Insulated Metal Window Cladding Panel

Risk factors	Observation	Positive	Neutral	Negative
K.1 - General (Calorific value of materials used)	<ul style="list-style-type: none"> Insulated Metal Window Cladding Panel (outer non-ferrous metal sheet, pink foam insulation core material and inner metal sheet) - Assumed to be combustible, Euroclass D, unless stated and confirmed otherwise. <p>Overall: >3 MJ/kg and ≤35 MJ/kg</p> <p>Each individual components could be assumed their classification to BS EN 13501-1.</p>			
K.2 - External surfaces; reaction to fire classes	<p>Grey outer metal sheet (non-ferrous)</p> <p>Limited in extent in relation to the entire building envelope.</p>			

K.3 - Facings/cladding panels	Medium Heat Release Rate The outer face of the external wall system is grey non-ferrous panel.			
K.4 - Panel construction	No gaps between the panels.			
K.5 - Cavities	No cavity void.			
K.6 - Insulation	N/A			
K.7 - Substrate	N/A			
K.8 - Sheathing boards	N/A			
K.9 - Insulated core panels	Insulated metal panel with pink foam insulation core material (combustible)			
K.10 - External Thermal Insulation Composite System (ETICS)	N/A			
K.11 - Infill/span-drel panels	N/A			
K.12 - Internal finishes	N/A			

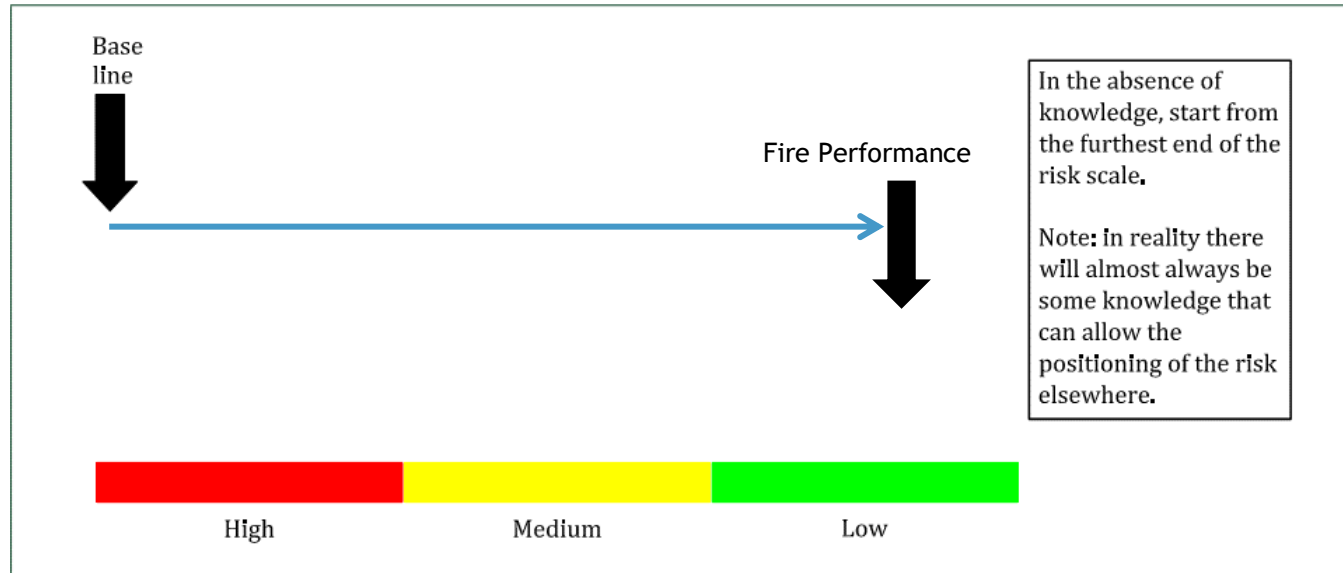
By considering the fire performance risk factors for EWT5, the risk moves to **MEDIUM**.

**Table 7: Fire performance risk factors – EWT6 – Curtain Walling**

Risk factors	Observation	Positive	Neutral	Negative
K.1 - General (Calorific value of materials used)	<ul style="list-style-type: none"> Non-ferrous Metal Cladding Panel - Assumed to be Euroclass A2 or better; and Cavity Void with Loosely Positioned Glass/Mineral Wool Insulation – Euroclass A1 non-combustible. <p>Overall: >3 MJ/kg and ≤35 MJ/kg.</p> <p>Each individual components could be assumed their classification to BS EN 13501-1.</p>			
K.2 - External surfaces; reaction to fire classes	<p>Low Heat Release Rate</p> <p>Non-ferrous Metal Cladding Panel - Assumed to be Euroclass A2 or better, unless stated and confirmed otherwise</p> <p>Limited in extent in relation to the entire building envelope.</p>			

K.3 - Facings/cladding panels	The outer face of the external wall system is grey non-ferrous metal panel, which is assumed to be Euroclass A2 or better unless stated and confirmed otherwise			
K.4 - Panel construction	There are no gaps between the panels.			
K.5 - Cavities	<p>Cavity void with loosely positioned glass/mineral wool insulation (Euroclass A1 non-combustible).</p> <p>The materials facing into the cavity are glass/mineral wool insulation (Euroclass A1 non-combustible) and non-ferrous metal panel (Euroclass A2 or better unless stated and confirmed otherwise).</p> <p>No cavity barriers were observed within this wall type. However, it should be noted that EWT6 has only been installed on the staircase and given that the staircase serves as a single compartment; therefore, generally does not require cavity barriers at horizontal floor levels.</p>			
K.6 - Insulation	Glass/Mineral Wool Insulation – Euroclass A1 non-combustible.			
K.7 - Substrate	N/A			
K.8 - Sheathing boards	N/A			
K.9 - Insulated core panels	N/A			
K.10 - External Thermal Insulation Composite System (ETICS)	N/A			
K.11 - Infill/sandrel panels	N/A			
K.12 - Internal finishes	N/A			

By considering the fire performance risk factors for EWT6, the risk moves to **LOW**. Therefore, no further assessment is considered in this FRAEW report for this external wall according to PAS9980:2022.



9.2 Façade Configuration Risk Factors

Table 8: Façade configuration risk factors – EWT2 – Terracotta Tiles

Risk factors	Observation	Positive	Neutral	Negative
N.1 - Building height	<18m (last habitable floor level)			
N.2 - Height of base of cladding above ground	The cladding starts from ground floor of the building (i.e., <2m) Low influence is considered since the external face is a Terracotta tiles.			
N.3 - Extent of cladding	The cladding has been installed on front, right side and rear elevations of the building.			

	The blue coloured tiles are only found on the ground floor, whereas the grey coloured tiles are installed on the upper elevations (from 1 st -4 th floor levels).			
N.4 - Cavities	With regards to cavity barriers - no proprietary mineral wool-based cavity barriers were observed at any of the inspected locations (i.e., window openings and compartment lines).			
N.5 - Infill/spandrel panels	N/A			
N.6 - Setbacks	N/A			
N.7 - Overhangs and projections	N/A			
N.8 - Proximity to windows and other openings to the accommodation	Horizontally adjacent to windows and openings, as well as vertically inline with such openings, such that fire and smoke spread into the buildings, causing secondary fires, as a result of direct flame impingement, is possible, but only under adverse wind conditions.			
N.9 - Presence of vents or other openings for services in the façade	No vent openings were found within this wall type.			
N.10 - Proximity of combustible elements of a façade to escape route windows and other openings	To the best of our understanding, there are no combustible materials on the building façade that are installed in close proximity to window / door openings, such that in an event of a fire, flames and smoke spread into the escape routes may not create untenable conditions.			
N.11 - Attachments	N/A			
N.12 - Proximity of combustible elements of a façade to a neighbouring building	N/A			

By considering the façade configuration risk factors for EWT2, the risk remains at **MEDIUM**.

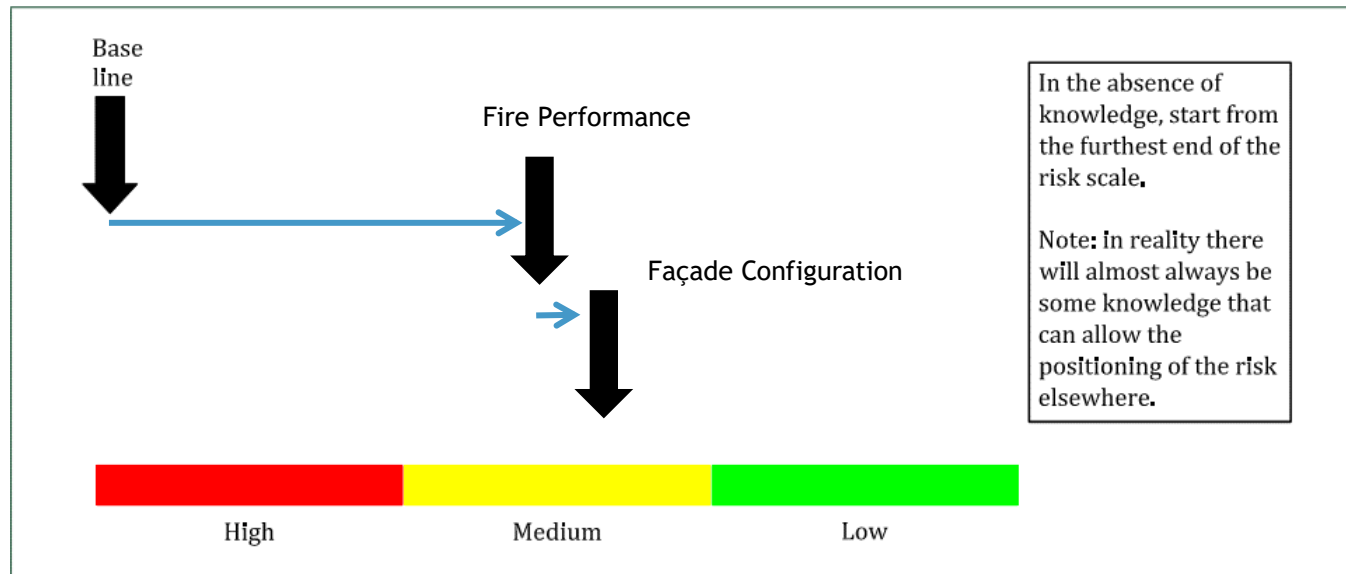


Table 9: Façade configuration risk factors – EWT4 – Silver ACM Cladding Panels

Risk factors	Observation	Positive	Neutral	Negative
N.1 - Building height	<18m (last habitable floor level)			
N.2 - Height of base of cladding above ground	The cladding is found only on the top 2 floors (4 th and 5 th floor) of the building on all elevations (i.e., >2m)			
N.3 - Extent of cladding	The ACM panels are limited in extent of the overall building envelope.			
N.4 - Cavities	With regards to cavity barrier provisions within EWT4, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected locations.			
N.5 - Infill/spandrel panels	N/A			

N.6 - Setbacks	ACM clad external wall (on both levels 4 & 5) steps back from the main brick façade of the building (EWT1).			
N.7 - Overhangs and projections	<p>Metal Roof Overhang Detail – This detail is located on top two floors of the building (levels 4 and 5) and understood to be constructed of metal and clad with horizontal timber plank.</p> <p>This is considered to be a negative risk factor in this case as it has potential to accelerate the fire spread.</p>			
N.8 - Proximity to windows and other openings to the accommodation	<p>Horizontally adjacent to windows and openings, but not vertically (as EWT4 steps back from the main building façade) in line with such openings, such that fire and smoke spread into the building is likely.</p> <p>Due to the nature of openings, it is considered that the fire can reach the ACM Cat 3 and lead to spread to adjacent apartments.</p>			
N.9 - Presence of vents or other openings for services in the façade	Vents were present within this wall type without cavity barriers.			
N.10 - Proximity of combustible elements of a façade to escape route windows and other openings	To the best of our understanding, there are combustible materials on the building façade that are installed in close proximity to window / door openings, such that in an event of a fire, flames and smoke spread into the escape routes can create untenable conditions. However, this might not happen for the both of means of escapes at the same time. Therefore, lower influence is considered for this risk factor.			
N.11 - Attachments	<p>Terrace/balcony zones, which are understood to be located on the 4th and 5th floor of the building, and understood to comprise of timber decking installed over the concrete floor slab. See section 8.7 for further details.</p> <p>The timber decks can provide additional fire load to the potential external wall fire spread.</p>			
N.12 - Proximity of combustible elements of a façade	N/A			

to a neighbouring building				
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By considering the façade configuration risk factors for EWT4, the risk remains at **HIGH**.

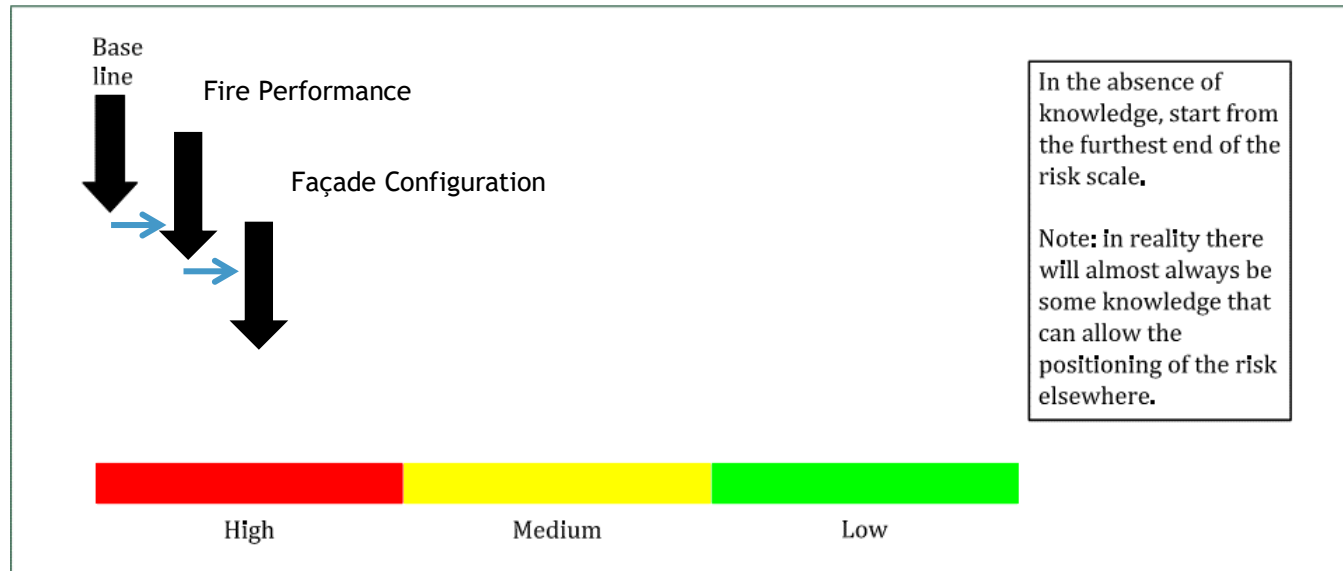
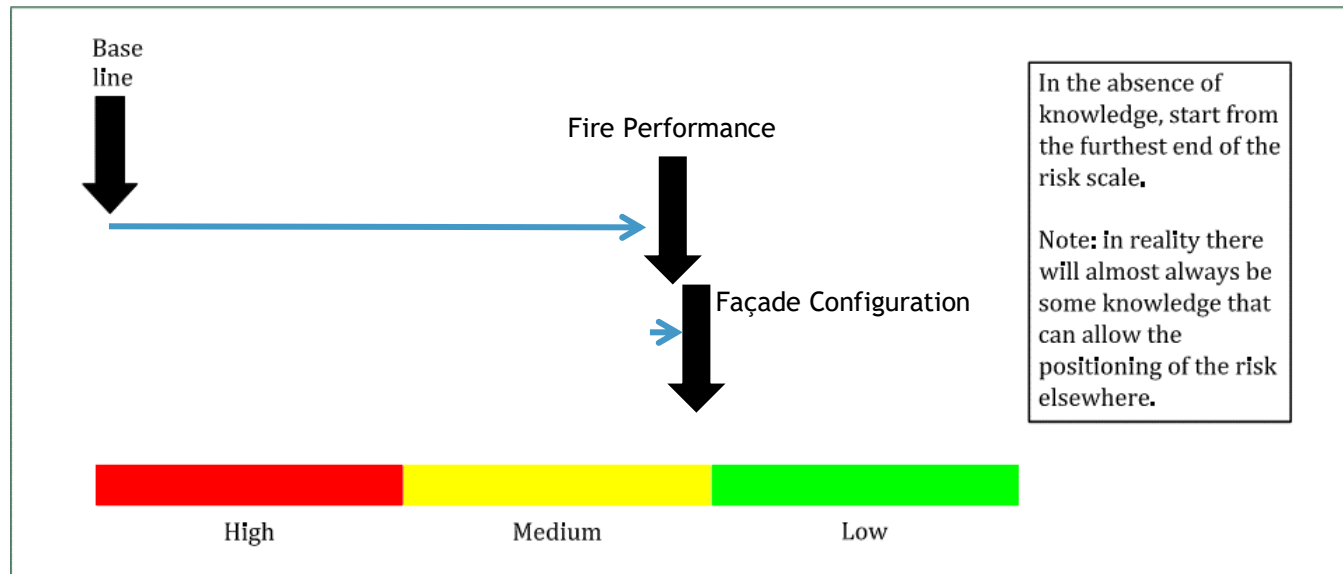


Table 10: Façade configuration risk factors – EWT5 – Grey Insulated Metal Window Cladding Panel

Risk factors	Observation	Positive	Neutral	Negative
N.1 - Building height	<18m (last habitable floor level)			
N.2 - Height of base of cladding above ground	The cladding is found from 1 st to 4 th of the building on front and rear elevation (i.e., >2m)			
N.3 - Extent of cladding	The insulated panels are limited in extent in relation to the overall building envelope.			
N.4 - Cavities	With regards to cavity barrier provisions within EWT5, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected locations. It should be noted that EWT5 is installed			

	vertically between windows and to the best of our knowledge and understanding, does not span across the compartment lines.			
N.5 - Infill/spandrel panels	Insulated metal panel with pink foam insulation core material (combustible)			
N.6 - Setbacks	N/A			
N.7 - Overhangs and projections	N/A			
N.8 - Proximity to windows and other openings to the accommodation	Horizontally adjacent to windows openings, but not vertically in line with such openings, such that fire and smoke spread into the building is highly unlikely.			
N.9 - Presence of vents or other openings for services in the façade	N/A			
N.10 - Proximity of combustible elements of a façade to escape route windows and other openings	To the best of our understanding, there are no combustible materials on the building façade that are installed in close proximity to window / door openings, such that in an event of a fire, flames and smoke spread into the escape routes can create untenable conditions.			
N.11 - Attachments	N/A			
N.12 - Proximity of combustible elements of a façade to a neighbouring building	N/A			

By considering the fire performance risk factors for EWT5, the risk remains at **MEDIUM**.



9.3 Fire Strategy/ Hazardous Risk Factors

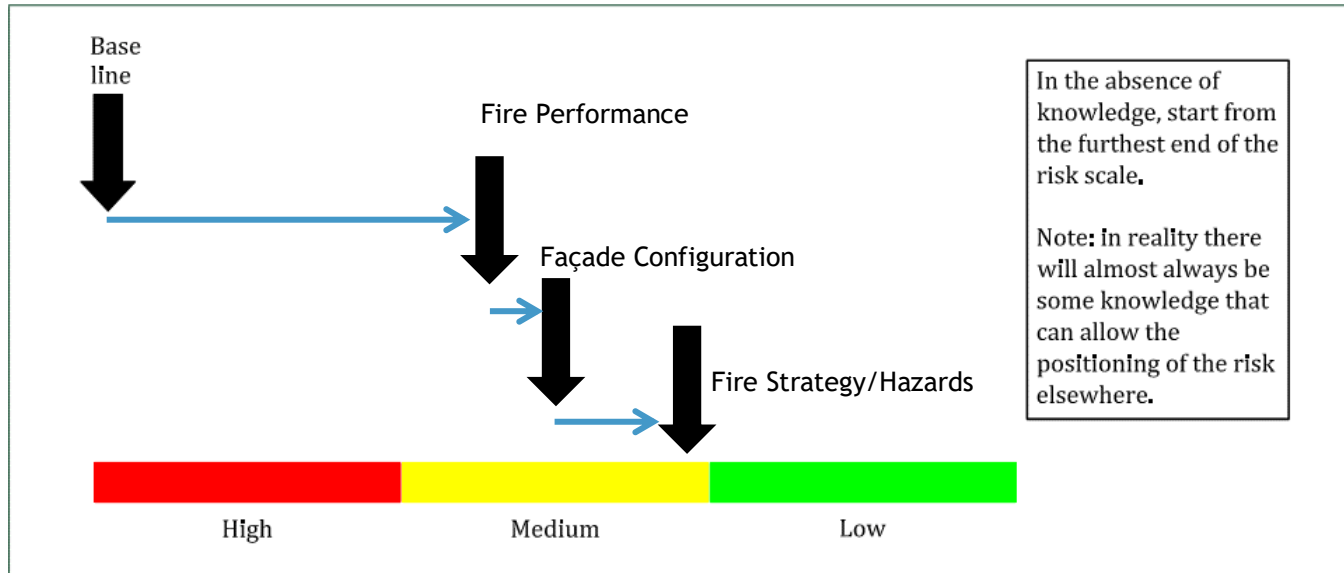
Table 11: Risk factors arising from fire strategy/fire hazards (including limitations of fire and rescue service intervention) for the building

Risk factors	Observation	Positive	Neutral	Negative
F.1 - Occupancy	Agecroft House is a mixed used building. Ground floor is primarily commercial space, basement is used by the commercial occupier on the ground floor and 2 nd floor to 5 th floor consists of residential units.			
F.2 - Evacuation strategy	FRA [1] states that, site-specific Fire Evacuation Procedures should be in place to ensure that all persons are aware of what to do in a Fire Emergency. However, based on our general walk around through the internal areas of the building (where access was granted), fire action notice was observed posted in the communal areas of the building, which stated the following:			

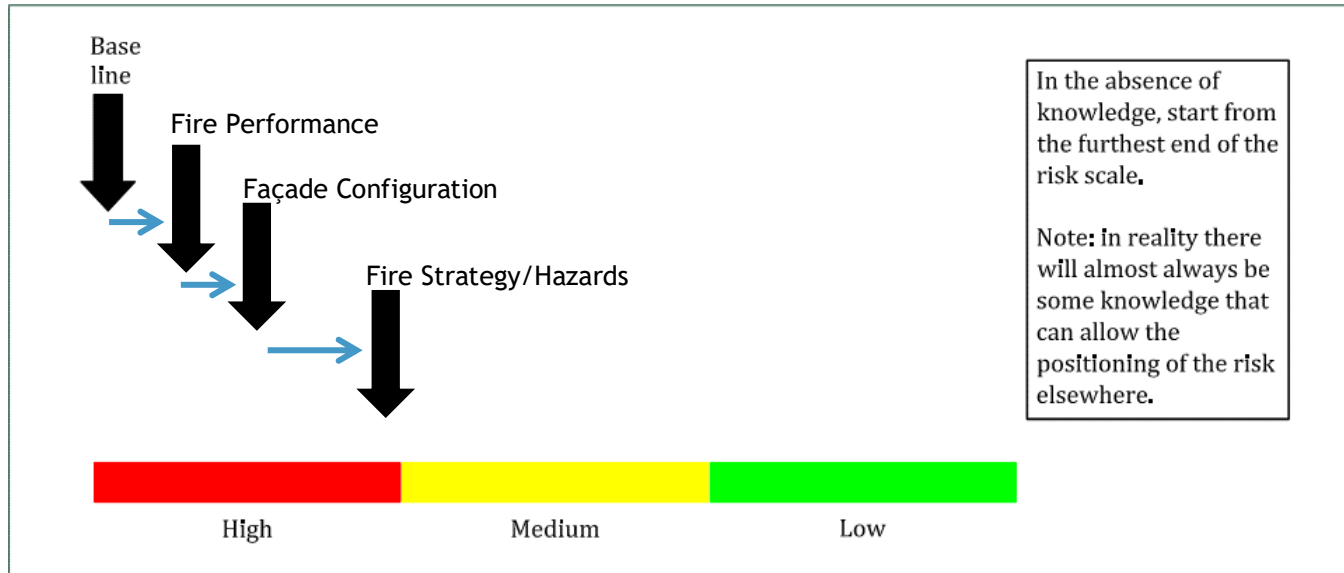
	<p>'IF YOU DISCOVER A FIRE IN YOUR APARTMENT</p> <ol style="list-style-type: none"> 1. Warn everyone in the apartment. Make sure everyone leaves. Remember the Fire Brigade advice "Get out! Stay out! Call us out!" 2. Ensure the Fire Brigade are called. 3. Sound the alarm at the nearest break-glass point as you leave.' <p>Based on the above, it is our understanding that the building currently operates on a 'Stay put' Policy, unless confirm otherwise by the client.</p>			
F.3 - Escape route design	Based on the recent FRA [1], premises is provided with adequate means of escape. There are two protected means of escape, this is by two staircases provided for the premises separated at each level by fire rated doors.			
F.4 - Compartmentation	The FRA report [1] states that the compartmentation that could be observed appeared to be of suitable fire resisting construction. Fire separation between these different occupancies is to a minimum 60-minute fire resistance.			
F.5 - Smoke control	<p>According to the FRA, the premises are provided with smoke vents for the staircases and for the communal corridors. The smoke vents were last tested and maintained on 21/04/2022, with having regular resting for the smoke ventilation and smoke control curtain for correct operations.</p> <p>Based on our site visit, 2No. openings were noted at the head of the staircase (which are believed to be AOV's, unless confirmed otherwise); and lobby smoke ventilation panel was also noted at the ground floor.</p>			
F.6 - Fire detection and fire alarm system	The FRA [1] states that the premises is provided with fire alarm/detection system appropriate for this type of occupancy. However, it does not exactly state what type of alarm system has been provided throughout the building i.e., a standard L2 or an enhanced L1 system.			

F.7 - Fire suppression	As per the FRA document [1] and based our site visit, no sprinkler system has been installed in the building.			
F.8 - Firefighting facilities	As per the FRA document [1], the fire service access is deemed to be satisfactory. Hydrants or other water supplies are located suitably close to the premises.			
F.9 - Rising mains	No information has been provided in the FRA with regards to riser within the building.			
F.10 - Lifts for use by firefighters	No firefighting lifts are required as the building is not over 18m to top floor.			
F.11 - Specific fire hazards	Normal fire hazards (e.g. potential ignition sources) for this type of occupancy with fire hazards generally subject to appropriate controls (other than minor shortcomings).			

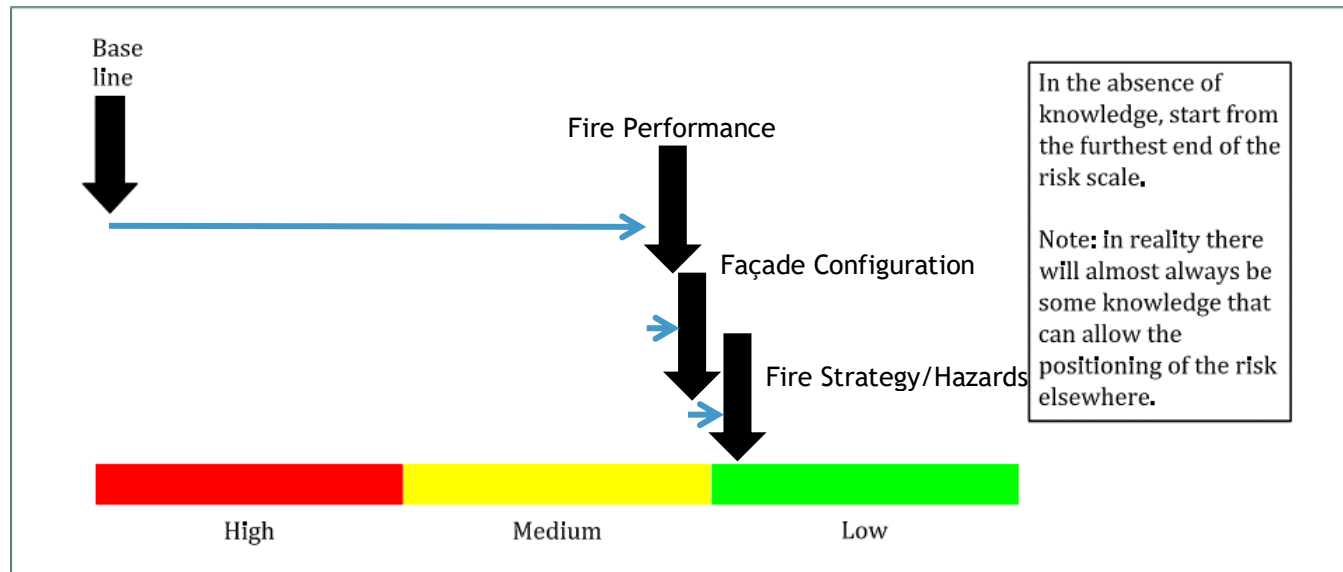
Final risk factor appraisal for – **EWT2**: This risk of external wall fire spread to harm the building occupants is concluded to be **MEDIUM** and tolerable. The final illustration risk for all risk factors is as below:



Final risk factor appraisal for – **EWT4**: This risk of external wall fire spread to harm the building occupants is concluded to be **HIGH**. The final illustration risk for all risk factors is as below:



By considering the fire performance risk factors for EWT5, the risk moves to **LOW**. Therefore, no further assessment is considered in this FRAEW report for this external wall according to PAS9980:2022.



Testing against the PAS9980:2022 benchmark criteria:

- Since EWT4 has ACM (Category 3) cladding panels (assumed to be highly combustible), there is substantial risks for extremely rapid external fire spread over this external wall. The wooden soffit of the protruded roof can worsen the potential lateral spread of fire, as the wooden timber planks will add more load to the fire and the plume will be directed to spread under the soffit (to become a ceiling impingement plume) in case of any flat fire.
- Multiple secondary fires can occur due to the potential lateral fire spread and falling ignited debris (Fire brands) from the ACM cladding (CAT 3).
- The ACM (CAT 3) clad external walls are setback in most of locations, although very limited in some areas, and the building has two means of escapes. However, due to the nature of ACM (CAT 3) and the installation of the wooden soffit and timber decking, there is a high chance falling debris, as well as smoke together can make the means of escapes untenable, especially when the stairs are surrounded by the ACM (CAT 3) from the top floor.

- Fire and rescue services intervention has found to be extremely difficult in case of ACM (CAT 3) fires. This is mainly due to multiple falling debris and fire brands. In this building, it might be even harder, since the ACM (CAT 3) cladded external walls are surrounded with timber decking from terrace/balcony zones below and wooden soffit from the top, which can present a substantial risk for firefighting operation.

Therefore, based on the fire risk appraisal performed according to the PAS9980:2022 methodology, the overall risk of external walls fire spread in the building is **HIGH**. Remedial works are required.

10.0 CONCLUSION

Taking into consideration a holistic view of the fire risk when considering the risk factors for the fire performance, façade configuration and the fire strategy and fire hazards, the outcome of this assessment as below:

EWT1 comprises of masonry facing brick façade, which covers majority of the building envelope and has been installed from ground to 4th floor of the building on all elevations. It is best understood that EWT1 solely consists of non-combustible materials (A1) within its build-up (brick and blockwork with mineral/glass wool insulation) with the exception of the thin EPDM membrane (which was only found at the inspected horizontal floor slab level), given the low combustible mass of the external wall materials within this wall type, it is our view that this will significantly reduce the risk of fire spread up and across the building envelope. With regards to cavity barrier provisions within EWT1, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas (i.e., compartment lines, window openings and vent penetration). However, given that EWT1 is believed to comply with all the parameters put forward within Diagram 8.2 of the current ADB and Diagram 32 of the old ADB, (i.e., two leaves of brick or concrete assuming each at least 75mm thick, cavities are closed around opening to limit air infiltration and the cavity at the top of the external wall is also closed off), based on this, it can be concluded that cavity barriers are not required for this external wall system and the likelihood of fire spreading through this façade system is low. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT1 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

EWT2 comprises of grey and blue coloured terracotta tiles, which have been installed from ground - 4th floor level on front, right side and rear elevations of the building. It is best understood that EWT2 primarily comprises of A1 non-combustible materials (outer terracotta tiles and blockwork substrate with mineral wool insulation), with the exception of the thin breather membrane, given the low combustible mass of the external wall materials within this wall type, it is our view that this will significantly reduce the risk of fire spread up and across the building envelope. With regards to cavity barrier provisions within EWT2, no proprietary mineral wool-based cavity barriers were observed at any of the inspected locations (i.e., window openings and compartment lines). In-addition to this, whilst inspecting EWT2, horizontal steel structures were observed on the building façade at the floor slab levels, which creates a divide between the terracotta system, and also present vertically, which is understood to create a divide between EWT2 and EWT1. The paint applied on the steel structure (unclear if it is intumescent or not) was observed to be peeling off. It should be noted that if the horizontal and vertical steel works (as noted on site) are considered primary structural, loadbearing elements of the building, then they are required to be adequately fire protected to uphold the same level of fire resistance as the element of structure for the building. Review of structural fire performance of the building is currently excluded from our FRAEW scope of works. By considering these risk factors (as outlined in detail in section 8), it is concluded that the external fire spread risk from EWT2 to harm the building occupants is **MEDIUM** and tolerable, hence in our opinion, remedial action is not needed to this wall system.

EWT3 comprises of a grey coloured metal cladding panel (ferrous), which is believed to be installed to a limited area of the building envelope from 1st - 4th floor level (on concrete/blockwork substrate and divided by windows) on front, right and rear elevations of the building. Wall build-up for EWT3 is understood to comprise of grey coloured PPC coated metal cladding panel (ferrous), followed by a thin layer of Sarnafil membrane (which is understood to be a waterproofing membrane with a Euroclass E reaction to fire classification), applied to a metal sheet (ferrous). EWT3 is installed directly back to the concrete/blockwork substrate in the absence of a cavity void. In addition to this, it should be noted that EWT3 steps back from the main body of the façade and the adjacent wall types are either EWT1 (brick), EWT2 (terracotta tiles) or vertical steel columns. Based on this, it can be said that the risk of rapid fire spread across the façade causing harm to the building occupant, or causing fire spread to the adjacent external wall types, from the thin layer of combustible Sarnafil membrane is considered to be negligible. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT3 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

EWT4 comprises of a silver-coloured ACM cladding panel, which is believed to have been installed on the top 2 floors (4th and 5th floor) of the building on all elevations. Wall build-up for EWT4 is understood to comprise of a silver-coloured ACM cladding panel (which has been fixed back to the building substrate by the aid of metal cladding support rails), followed by a cavity void, Tyvek breather membrane and mineral wool insulation (A1 non-combustible). The substrate behind EWT4 was inspected to be solid A1 non-combustible blockwork. With regards to cavity barrier provisions within EWT4, no proprietary cavity barrier products were observed at any of the inspected locations. By considering these risk

factors (as outlined in detail in section 9) and the test against the PAS9980:2022 benchmarks, it is concluded that the external fire spread risk from EWT2 to harm the building occupants is **HIGH**, hence in our opinion, remedial actions are needed to this wall system.

EWT5 comprise of a grey coloured insulated metal cladding panel (non-ferrous) with a pink coloured foam insulation core material. EWT5 is understood to be installed vertically between windows (on the front and rear elevations) and to the best of our knowledge and understanding, EWT5 is installed within the same compartment and does not span across the compartment lines. By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT5 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

EWT6 comprise of a grey coloured metal cladding panel (non-ferrous), which has been installed horizontally as part of the staircase curtain walling system on the front and rear elevations of the building (on both the staircases). With regards to cavity barrier provisions within EWT6, no proprietary mineral wool-based cavity barrier products were observed at any of the inspected areas, however, it should be noted that given that the staircase serves as a single compartment; and therefore, generally, under ADB guidance, does not require proprietary cavity barriers at horizontal floor levels, but only vertically between the curtain walling and the adjacent areas, which in this case is mostly EWT1 (brick). By considering these risk factors (as outlined in detail in section 9), it is concluded that the external fire spread risk from EWT6 to harm the building occupants is **LOW**, hence in our opinion, remedial action is not needed to this wall system.

With regards to external wall attachments, limited to the areas accessed and reviewed during our site inspections, it is best understood that the building comprises of the following attachments.

1. **Metal Bolt on Balconies** – These attachments clearly protrude out, away from the main body of the façade and are located only on one elevation of the building (front). These balconies are designed to serve apartments located on levels 1-4. Limited to a visual, non-intrusive observation, these balconies appear to be constructed of a metal frame with timber planks installed to both the floor decking and the soffit. The timber planks appear to be installed tightly abutted together with limited gaps in-between, which, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
2. **Recessed Inset Balconies** – This balcony detail is incorporated within the façade and designed to reside recessed back from the main body of the brick façade (EWT1). The inset balconies are located only on one elevation of the building (rear). These balconies are designed to serve apartments located on levels 1-4 and are believed to be an extension of the concrete floor slab (unless confirmed otherwise) with timber planks to both the floor decking and the soffits. Likewise, as that stated for the metal bolt on balconies, the timber planks are understood to be installed tightly abutted together with limited gaps in-between. This, coupled with a concrete floor slab on to which the timber planks are understood to be installed, in our opinion, will serve as a positive factor in preventing the passage of fire from one balcony to another and unlikely to cause rapid fire spread across the façade causing harm to building occupants.
3. **Terrace/balcony zones** – These areas are understood to be located on the 4th and 5th floor of the building, , and understood to comprise of timber decking installed over the concrete floor slab.
4. **Metal Roof Overhang Detail** – This detail is located on top two floors of the building (levels 4 and 5) and understood to be constructed of metal and clad with horizontal timber plank.

The risk of fire spread for the balconies/terrace in the building is considered to be **MEDIUM** and tolerable, hence in our opinion, remedial action is not needed to this external wall attachment.

Each external wall and the building are considered against the PAS9980:2022 benchmark criteria. Based on the fire risk appraisal performed according to the PAS9980:2022 methodology, the overall risk of external walls fire spread in the building is **HIGH**. Remedial actions are required for the building external walls.

From the EWS1 perspective, a B2 rating can be provided following this FRAEW report.

The Fire Risk Assessment is recommended to be reviewed following this FRAEW report.

11.0 RECOMMENDATION

Since the risk is **HIGH**, the following remediation actions are recommended:

- Remove the ACM (CAT3) from EWT4 and replace them with materials achieving a minimum of A2 or better i.e., A1 non-combustible, as outlined within the current Approved Document B to comply with the current Building Regulation.
- Install robust and effective cavity barriers in EWT4 according to the current Approved Document B to comply with the current Building Regulation.

12.0 INTERIM MEASURES

It is recommended that the risk assessor of the building to implement simultaneous evacuation as outlined in NFCC guidance until the required remediations will be implemented.

13.0 REVIEW

This FRAEW report should be reviewed in the below cases:

- If significant changes/repairs have been made to the external wall; and/or
- In the event of a fire incident, if the fire involved the external wall construction; and/or
- If there are any circumstances, depending upon the nature of the construction, the extent of available knowledge in relation to the particular materials, components and systems used on the building or the degree of uncertainty over the findings, that suggest review is appropriate.

14.0 APPENDIX

14.1 [A] – Sarnafil Technical Datasheet

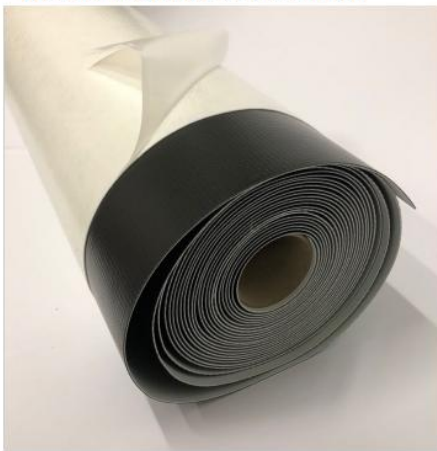

BUILDING TRUST

PRODUCT DATA SHEET

Sarnafil® AT-18 FSA P

POLYMERIC SELF-ADHERED DETAILING SHEET FOR SARNAFIL® AT ROOF WATERPROOFING MEMBRANES

<p>PRODUCT DESCRIPTION</p> <p>Sarnafil® AT-18 FSA P is a reinforced multi-layer, self-adhesive, synthetic roof waterproofing sheet based on flexible polyolefins (FPO). Sarnafil® AT-18 FSA P is a hot air weldable, UV-resistant roof detailing membrane for upstands.</p> <p>USES</p> <p>Sarnafil® AT-18 FSA P may only be used by experienced professionals.</p> <p>Self-adhered membrane for the exposed application on roofing upstands:</p> <ul style="list-style-type: none"> ▪ Hot air welded to the installed Sarnafil® T / Sarnafil® AT roof waterproofing membranes 	<p>CHARACTERISTICS / ADVANTAGES</p> <ul style="list-style-type: none"> ▪ Fast installation of membrane ▪ Resistant to permanent UV exposure ▪ Resistant to most common environmental influences ▪ High dimensional stability due to glass fleece inlay ▪ Resistant against impact load and hail ▪ Resistant to micro organisms ▪ Resistant to old bitumen ▪ Hot air welding without use of open flame
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Product Data Sheet
Sarnafil® AT-18 FSA P
May 2023, Version 02.02
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Water Vapour Transimission	$\mu = 190\ 000$	(EN 1931)
Exposure to Bitumen	Pass ¹⁾ <small>¹⁾ Sarnafil® AT is compatible with old bitumen</small>	(EN 1548)
Effect of Liquid Chemicals, Including Water	Resistant to many chemicals. Contact Sika Technical Services for additional information.	(EN 1847)
UV Exposure	Pass (> 5000 h / grade 0)	(EN 1297)
Reaction to Fire	Class E	(EN ISO 11925-2, classification to EN 13501-1)

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

ulation or on the candidate list published by the European Chemicals Agency in concentrations above 0,1 % (w/w).

FURTHER DOCUMENTS

- Installation Instructions: Sarnafil® AT roof systems

LIMITATIONS

Installation work must only be carried out by Sika trained and contractors, experienced in this type of application.

- Do not apply to wet, damp or unclean surfaces
- Sarnafil® AT-18 FSA P must only be applied to compatible substrates (refer to compatibility section).
- The use of Sarnafil® AT-18 FSA P membrane is limited to geographical locations with average monthly minimum temperatures of -50 °C. Permanent ambient temperature during use is limited to +50 °C.
- The use of some ancillary products such as adhesives, cleaners and solvents is limited to temperatures above +5 °C. Observe temperature limitations in the appropriate Product Data Sheets.
- Special measures may be compulsory for installation below +5 °C ambient temperature due to safety requirements in accordance with national regulations.
- Sarnafil® AT-18 FSA P must be installed without stretching or installing under tension.
- Sarnafil® AT-18 FSA P is used for detailing and must not be used as a roof waterproofing membrane to cover the complete flat roof area.

ECOLOGY, HEALTH AND SAFETY

Fresh air ventilation must be ensured, when working (welding) in closed rooms.

REGULATION (EC) NO 1907/2006 - REACH

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in the product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH reg-

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14.2 [B] – Samples Extracted from Site

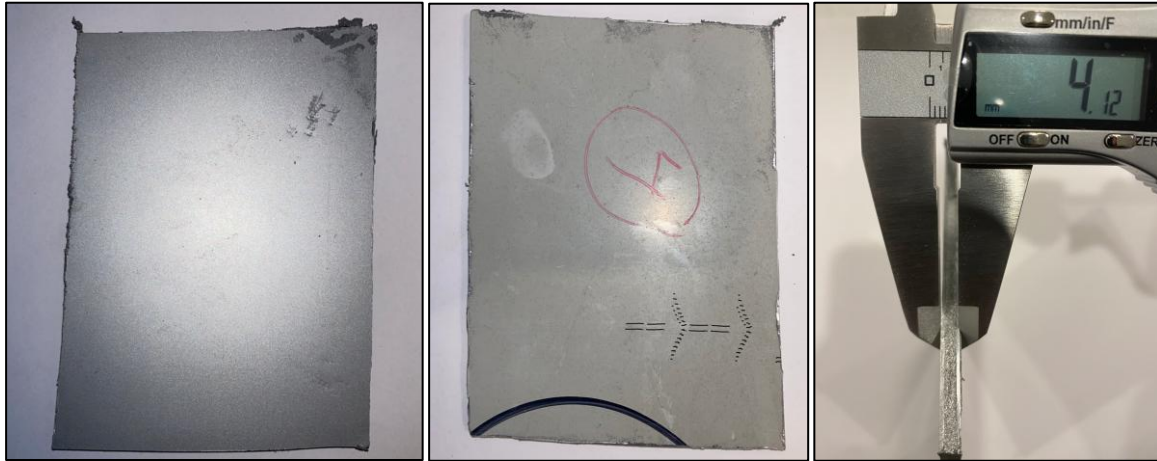
Metal Cladding Panel (EWT3) – Sample 1



Metal Cladding Panel (EWT3) – Sample 2



Silver ACM Cladding Panel (EWT4) – Sample 3



Silver ACM Cladding Panel (EWT4) – Sample 4

