FIRNTEC
BUILDING COMPLIANCE

Unit 4a, Darklake View,
Estover
Plymouth
PL6 7TL

Document Version 1
Survey Date 28/08/2025
Suggested Review Date 28/08/2030

# FIRE RISK APPRAISAL EXTERNAL WALLS

## ASTBURY COURT

Kingsway
Brandhall
B68 0QG

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# Summary

## Fire Risk Appraisal External Walls

**Assessment and Certificate Reference**
RB-888XZY

**Assessed On, By**
28/08/2025, James Major (Facade Manager)

**Approved / Validated On, By**
04/09/2025, Alex Dodd EngTech MinstRE (Lead Facade Consultant)

**Recommended Review Date**
28/08/2030

**Produced For the Responsible Person**
Sandwell Metropolitan Council

**Specification Conforms To**
Our own internal quality system.

**Assessment Scope**
Assessment applies only to the building specified.

### Assessed Property

**Property Name**
Astbury Court

**Property Reference**
RB-QUK8AY

**Address**
Kingsway
Brandhall
B68 0QG

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**Assessing Organisation**
Firntec Ltd
4a Darklake View, Estover, Plymouth, Devon, PL6 7TL
0345 646 1566 — www.firntec.com

# Abbreviation/ Term Definition

- **ACM** Aluminium Composite Material
- **ADB** Approved Document B
- **AOV** Automatic Opening Vent
- **BSA** Building Safety Act 2022
- **Cavity Barrier** Product used to close or separate a concealed space to restrict fire and smoke
- **Close State Cavity Barrier** Cavity Barrier designed to be fitted under compression/friction between inner and outer surfaces of a cavity to seal it
- **Open State Cavity Barrier** Cavity Barrier that is open to allow ventilation/drainage of cavity in open state but closes when a developing fire occurs (e.g., intumescent strip)
- **Combustible** Not classified as A1 OR A2 in accordance with BS EN 13501-1: 2018, and not meeting definitions of non-combustible or limited combustibility
- **Compartmentation** Subdivision of building by fire resisting walls and/or floors for limiting fire spread
- **EPS** Expanded Polystyrene
- **EWS1** External Wall System Fire Valuation Form
- **FB** Fire Barrier - Separating element with fire integrity for a specific time
- **Fire Stop** Barrier seal to close an imperfect fit in design between elements of components to stop the spread of fire
- **FRAEW** Fire Risk Appraisal of External Walls
- **FRA** Fire Risk Assessment
- **FRS** Fire and Rescue Services
- **FSA** Fire Safety Act 2021
- **HPL** High Pressure Laminate
- **HRR** Heat Release Rate
- **MDF** Medium Density Fibre Board (a type of manufactured timber)
- **PIR** Polyisocyanurate Rigid Foam
- **PUR** Polyurethane Foam
- **RP** Responsible Person
- **RRFSO** Regulatory Reform (Fire Safety) Order 2005
- **SFS** Steel Framing System
- **SIB** Secure Information Box

# Statement of Competency

Statement of Competency to Carry out a Fire Risk Appraisal of External Wall Construction

Within PAS 9980:2022 it requires that a person conducting the FRAEW are competent to do so in accordance with Annex H and to demonstrate the expected skill sets of competent external wall assessors.

This is our Statement of Competence to carry out a Fire Risk Appraisal of External Wall construction.

We confirm that they have:

a) Read and understood the commentary and provisions relating to the competence of external wall assessors set out in Section 8 and Annex H of PAS 9980:2022;

b) Adequate and relevant competence to undertake the FRAEW;

c) Sufficient knowledge, skills and experience in relation to fire safety of external walls to be able to complete an assessment at the level required;

d) The relevant skill, knowledge, and experience to manage and interpret the results of intrusive inspections; and

e) The competence to appraise and assess the nature of external wall construction in terms of fire performance and provide an opinion on the risk.

f) No conflicts of interest of any kind, other than any which are disclosed in the report.

g) The conclusions of the report are the author's independent assessment of the risks and remedial actions and have not been influenced in any way by the opinions or actions of others except where stated.

# Terms of Reference

## Particulars

This FRAEW report follows the guidance in accordance and reference to PAS9980:2022 Fire Risk Appraisal of External Walls construction and cladding of existing blocks of flats – Code of Practice.

## Limitations

The FRAEW addresses life safety only in relation to the appraisal of the external walls of the building; and in considering risk, this is only in relation to the threat to the occupants in the building and not in terms of property damage or other potential objectives, such as safety of firefighters.

The FRAEW is not aimed at confirming compliance with building regulations, either at the time of construction, or currently.

The FRAEW cannot provide certainty and being risk-based report, it is, therefore, to a degree, reliant on professional judgement in its assessment and in the conclusions drawn within the report.

The FRAEW report is to be reviewed:

a) if significant changes/repairs have been made to the external wall; and/or

b) in the event of a fire incident, if the fire involved the external wall construction; and/or

c) 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, which suggest review is appropriate. In these cases, the report will include a clear explanation as to why periodic review is necessary and include a suggested review date."

If more definitive information becomes available subsequent to the FRAEW on how particular external wall materials, components and systems behave in fire, or there are changes in the fire performance data relied upon in an FRAEW, such information will be expected to take precedence.

## Assumptions

It is understood that the absence of evidence, is not evidence of the absence; therefore, within the FRAEW report suitable caveats or assumptions may be applied in arriving at a risk rating, for example, in relation to:

a) the extent of sampling carried out.

b) the accuracy of information upon which it has been necessary to rely, especially where it has not been possible to verify the information though site survey and inspection.

c) the extent of the content and detail within the report; and

d) the limitations at the time of the FRAEW of available knowledge on the fire performance of the materials, products and systems forming the external walls of the building.

Any caveats or assumptions made within the report are based on the most onerous and worst-case scenarios.

## Statement of Intent

The investigation and writing of this FRAEW report has been commissioned at the clients request in line with PAS9980: 2022, which covers residential buildings of all heights with 2 or more dwellings, including hotels, with the aim to make sure that residents of multi-occupancy buildings are safe.

The Fire Safety Act 2021 also puts a legal responsibility on the responsible person where a building contains two or more sets of domestic premises to identify the building's structure and external walls and any common parts including doors or windows in those walls, and anything attached to the exterior of those walls (including balconies).

# Supporting Documents

The following documentation was requested for review prior to our visit. Any provided documentation has been reviewed and considered as part of our findings. The range, quality and reliability of the information contained in the provided documents have been examined and deemed satisfactory for completing this FRAEW report:

| Document | Received |
| --- | --- |
| **Fire Risk Assessment**<br>Sandwell Metropolitan Borough Council<br>Fire Risk Assessment | Received |

# Executive Summary

## External Wall Systems and Attachments on the Building

13 areas were inspected to gain data about the building's wall constructions. See the Inspections section of this report for full inspection details.

The table below outlines the ratings of the various wall systems and constructions to the property. Each element is explained in more detail further within this report.

| 6 Items | Effect | Risk |
|---|---|---|
| Wall Construction<br>Masonry (Brickwork) (AVA17E) | Positive | Low |
| Wall Construction<br>Aluminium Cladding System (ZXG8FM) | Positive | Low |
| Wall Construction<br>Terracotta Rainscreen System (H7MLZR) | Positive | Low |
| Wall Construction<br>Aluminium Spandrel Panel (QX98ZF) | Neutral | Low |
| External Window<br>Top, Mid, Side Hung Casements (6MJ9Q4) | Neutral | Low |
| External Door<br>Single Leaf Entrance Doors (KBR2LB) | Neutral | Low |

In accordance with the PAS 9980 Guidance, any items of construction which are considered as “Medium Risk” should be subject to periodic review, to ensure that conditions do not change, such that the risk may be upgraded to high, prompting the requirement for remediation.

# Risk Factor Analysis

The risk factor analysis is a three-stage process; rating the wall construction fire performance **(1)**, façade configuration **(2)**, and fire strategy/fire hazards **(3)** on a sliding risk scale. The risk scale is expressed as "high", "medium" and "low" in a continuum, left to right, from "high" risk to "low" risk. At the furthest left end of the "high" risk band, the risk is deemed to be the highest, reducing as the risk is positioned to the right of this.

Starting with high as a base line, **Stage 1** rates the fire performance risk factors of the wall construction.

Once fire performance factors have been taken into account, **Stage 2** overlays the risk factors of the façade configuration to determine the effect this has on where the risk now lies on the scale.

The final **Stage 3** overlays the risk factors arising from consideration of the fire strategy and fire hazards (including limitations of fire and rescue service intervention).

## Risk Factor Analysis 1

This analysis looks at façade configuration **R1CSSZ** which includes wall construction **AVA17E**.

**Conclusion**: This wall system is comprised of a double-leaf masonry system. In some sample locations it was observed to contain approximately 200mm of mineral wool insulation. In another location the cavity was observed to be void of any insulation. The outer leaf of masonry was identified as 102mm brickwork and the inner leaf was observed to be 100mm blockwork.

Masonry brickwork is generally considered fire-resistant and can provide significant protection against fire for structural and non-structural elements. Masonry bricks, typically made from clay or concrete, have very high melting points (above 1000°C for clay bricks), making them resistant to fire and heat. Bricks have low thermal conductivity. This helps prevent the spread of fire to adjacent areas and provides a thermal barrier that protects the underlying structure. Masonry walls provide effective fire containment, often preventing fire from spreading between compartments within a building. The thickness and density of the masonry wall determine its fire resistance rating.

Mineral wool, which includes materials like stone wool, is known for its excellent fire-resistant properties. Mineral wool has a very high melting point, typically around 1,000°C to 1,200°C. This makes it non-combustible, meaning it does not contribute to the spread of fire. In the event of a fire, mineral wool acts as a thermal barrier. Its fibrous structure traps air, reducing the transmission of heat to other parts of the structure and slowing the spread of fire. Mineral wool maintains its insulation properties and shape even at high temperatures, further protecting the structural components of buildings, like steel, from heat damage.

As set out in PAS9980, a building whose external walls are composed exclusively of this form of construction is not ordinarily expected to require an FRAEW. However, it is recognised that this form of wall construction might be mixed with other forms of wall construction. This form of construction constitutes the lowest risk form of construction that might be used for external walls, for the following reasons.
• Each leaf of the wall, provided it is formed of masonry/concrete at least 75 mm thick and is generally well constructed, is likely to provide at least 30 min fire resistance.
• The masonry/concrete is likely to be of limited combustibility or better.

Given the above, this form of construction is invariably accepted as:
• not requiring cavity barriers generally, except that cavity closers are needed so that there is no free flow of air through the cavity; and
• being able to accommodate combustible materials within the cavity irrespective of building height

No dedicated cavity barriers were identified within the wall system; however, it was observed that the cavity was fully filled with mineral wool, effectively disrupting the mechanism for vertical fire spread within the cavity.

This wall system forms the facade of the ground floor and spans the entire perimeter of the building. Structural openings in the facade include windows opening into the accommodation and is adjacent to the entrance/exit doors. Given the non-combustibility of the materials used to form the outer and inner leaf of the system, an externally venting fire from a compartment would not be expected to spread across this wall type, and the likelihood of an external fire igniting this wall type is also low.

This building operates a 'Stay Put' evacuation policy. It is anticipated that, due to the nature of the building's construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Low

## Risk Factor Analysis 2

This analysis looks at façade configuration **AR8WVK** which includes wall construction **ZXG8FM**.

**Conclusion**: This wall system is comprised of a 3mm aluminium panel affixed to an aluminium rail system. Beneath this is 100mm mineral wool insulation and the original brickwork.

Although aluminium is generally considered to be of limited combustibility, it is recognised as having a lower melting point than other metals used in construction. This may mean that in scenarios resulting in prolonged exposure to fire where temperatures exceed 600 degrees the material may begin to lose its structural integrity.

Mineral wool, which includes materials like stone wool, is known for its excellent fire-resistant properties. Mineral wool has a very high melting point, typically around 1,000°C to 1,200°C. This makes it non-combustible, meaning it does not contribute to the spread of fire. In the event of a fire, mineral wool acts as a thermal barrier. Its fibrous structure traps air, reducing the transmission of heat to other parts of the structure and slowing the spread of fire. Mineral wool maintains its insulation properties and shape even at high temperatures, further protecting the structural components of buildings, like steel, from heat damage.

Masonry brickwork is generally considered fire-resistant and can provide significant protection against fire for structural and non-structural elements. Masonry bricks, typically made from clay or concrete, have very high melting points (above 1000°C for clay bricks), making them resistant to fire and heat. Bricks have low thermal conductivity. This helps prevent the spread of fire to adjacent areas and provides a thermal barrier that protects the underlying structure. Masonry walls provide effective fire containment, often preventing fire from spreading between compartments within a building. The thickness and density of the masonry wall determine its fire resistance rating.

Horizontal Rockwool cavity barriers were identified in all sample locations. These were observed to be intumescent in order to close the air cavity under fire conditions.

This wall system forms continuous vertical sections in line with the windows of the building. They begin at ground floor and extend the full height of the building. Structural openings in the facade include windows opening into the accommodation. Given the limited combustibility of the materials used to form the system, an externally venting fire from a compartment would not be expected to spread across this wall type, and the likelihood of an external fire igniting this wall type is also low. The adjacent terracotta tiling system is also non-combustible.

This building operates a 'Stay Put' evacuation policy. It is anticipated that, due to the nature of the building's construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and

an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Low

## Risk Factor Analysis 3

This analysis looks at façade configuration **WWNQTK** which includes wall construction **H7MLZR**.

**Conclusion**: This wall system is comprised of a 15mm terracotta tile affixed to an aluminium rail system. Beneath this is 100mm mineral wool insulation and the original brickwork.

The terracotta tiles are generally considered to be non-combustible due to the nature of their composition and would not be expected so sustain, support, or contribute to fire spread across the external surface of the building.

Although aluminium is generally considered to be of limited combustibility, it is recognised as having a lower melting point than other metals used in construction. This may mean that in scenarios resulting in prolonged exposure to fire where temperatures exceed 600 degrees the material may begin to lose its structural integrity.

Mineral wool, which includes materials like stone wool, is known for its excellent fire-resistant properties. Mineral wool has a very high melting point, typically around 1,000°C to 1,200°C. This makes it non-combustible, meaning it does not contribute to the spread of fire. In the event of a fire, mineral wool acts as a thermal barrier. Its fibrous structure traps air, reducing the transmission of heat to other parts of the structure and slowing the spread of fire. Mineral wool maintains its insulation properties and shape even at high temperatures, further protecting the structural components of buildings, like steel, from heat damage.

Masonry brickwork is generally considered fire-resistant and can provide significant protection against fire for structural and non-structural elements. Masonry bricks, typically made from clay or concrete, have very high melting points (above 1000°C for clay bricks), making them resistant to fire and heat. Bricks have low thermal conductivity. This helps prevent the spread of fire to adjacent areas and provides a thermal barrier that protects the underlying structure. Masonry walls provide effective fire containment, often preventing fire from spreading between compartments within a building. The thickness and density of the masonry wall determine its fire resistance rating.

Rockwool cavity barriers were identified in all sample locations. These were observed to be intumescent in order to close the air cavity under fire conditions.

This wall system forms continuous vertical sections adjacent to the aluminium panel system. They begin on the first floor and extend the full height of the building. There are no structural openings in this wall type. Given the limited combustibility of the materials used to form the system, an externally venting fire from a compartment would not be expected to spread across this wall type, and the likelihood of an external fire igniting this wall type is also low. The adjacent aluminium system is also non-combustible and as such fire would not be expected to spread between the wall systems.

This building operates a 'Stay Put' evacuation policy. It is anticipated that, due to the nature of the building's construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and

an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Low

## Risk Factor Analysis 4

This analysis looks at façade configuration **LCC8CD** which includes wall construction **QX98ZF**.

**Conclusion**: The spandrel panel system is comprised of a 2mm aluminium panel affixed to an aluminium rail system. Within this sits approximately 180mm PIR foam insulation and a second aluminium panel.

Although aluminium is generally considered to be of limited combustibility, it is recognised as having a lower melting point than other metals used in construction. This may mean that in scenarios resulting in prolonged exposure to fire where temperatures exceed 600 degrees the material may begin to lose its structural integrity.

The PIR (Polyisocyanurate) is viewed as presenting a medium risk to the contribution to fire spread. PIR insulation is less combustible and has better fire performance compared to some other foam insulations. It ignites at temperatures typically around 300°C to 400°C, forms a protective char layer which helps to insulate and protect the underlying material, and generally produces less smoke and toxic gases. However, it can still contribute to fire growth and produce hazardous gases when it burns. It should be noted that the final fire performance of plastic foams such as PIR strongly depends on the chemical composition and manufacturing process. e.g., content of isocyanate linkages and type of isocyanate-reactive component for PIR.

A solid state mineral wool cavity barrier was identified at floor slab level that will act to prevent or delay the spread of fire between compartments/floors.

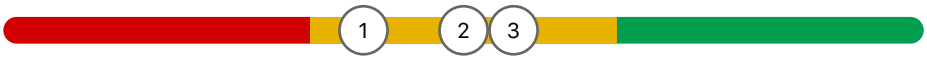
This wall system sits at floor level as part of the curtain wall forming the external surface of the escape staircase. It begins at the first floor level and extends the full height of the building. Structural openings in the facade include windows opening into the escape staircase. The adjacent wall systems of terracotta tiling and aluminium panels are non-combustible and, as such, would not be expected to allow fire to spread to this wall type containing combustible insulation. Due to this wall type beginning at the first floor above the primary entrance, the likelihood of exposure to external sources of ignition is limited.

This building operates a 'Stay Put' evacuation policy. It is anticipated that, due to the nature of the building's construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before

occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.




Medium

# Overall Building Risk Rating

Medium

Our professional opinion is that overall this Building represents a Neutral PAS9980:2022 Outcome.

# Recommended Remediations

No recommended remediations identified.

# Recommended Interim Measures

No recommended interim measures identified.

# Recommended Enhancements

No recommended enhancements identified.

# Fire Strategy

## Fire Strategy & Hazard Risk Factors

### F.1 Occupancy

| | |
|---|---|
| General needs housing | Neutral |

### F.2 Evacuation

| | |
|---|---|
| Stay put<br>A 'stay put' policy is adopted for the flats. That is, in the event of a fire in a flat, the occupants of that dwelling will evacuate, having been alerted by their own domestic fire detection and alarm system, and request fire service attendance. All other occupants will remain in their flat unless they are threatened by fire and smoke or are advised to evacuate by the fire service. The 'stay put' evacuation policy relies heavily on adequate compartmentation being provided; fire should not spread from one dwelling to another, including by means of the external fabric of the building<br><br>Photo Ref. 1, 2 | Neutral |

### F.3 Escape Route Design

| | |
|---|---|
| Single staircase, with lobby approach | Neutral |

### F.4 Compartmentation

| | |
|---|---|
| Adequate compartmentation in line with the expectations for a block of flats | Neutral |

### F.5 Smoke Control

| | |
|---|---|
| Arrangements in which openable windows, AOVs or inlets and outlets of mechanical systems are of a satisfactory proximity aways from combustible cladding; or that fire and smoke spread from the external envelope would be unlikely to compromise the effectiveness of the smoke control system or allow a route for fire spread back into the building | Neutral |

## F.6 Fire Alarm & Detection

Domestic smoke and heat alarms within flats, Category LD3

Neutral

## F.7 Fire Suppression

Suppression system fitted to refuse area.

Neutral

## F.8 - Firefighting Facilities

Adequate access for firefighting vehicles
NOTE This is where access is possible in line with benchmark guidance on access for firefighting vehicles, taking into account the size of the building (floor area), height of the building and whether fire mains are present in the building.

Photo Ref. 3

Neutral

## F.9 Rising Mains

Suitable rising main present

Photo Ref. 4, 5, 6

Neutral

## F.10 Lifts Used By Firefighters

No dedicated firefighting lift

Photo Ref. 7

Negative

## F.11 Specific Fire Hazards

Vehicle parking on roadways adjacent to building

Photo Ref. 3

Neutral

## Photos

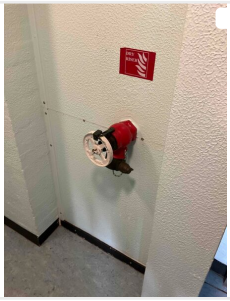
1


2


3


4

5



6

7

# Fire Service Intervention

| Event | Seconds | Minutes & Seconds |
|---|---|---|
| Initiation to fire detection | 120 Seconds | 2 Minutes |
| Actuation Of Fire Detector To Transmission Of Alarm | 10 Seconds | 10 Seconds |
| Processing By Central Monitoring Station | 60 Seconds | 1 Minute |
| Receipt of call by fire service mobilising control | 10 Seconds | 10 Seconds |
| Transmission To Fire Station And Response | 60 Seconds | 1 Minute |
| Travelling Time Of Fire Service | 480 Seconds | 8 Minutes |
| Arrival Protocol And Entry Preparation Time | 180 Seconds | 3 Minutes |
| Firefighting Travel In Firefighting Lift | 0 Seconds | — |
| Firefighter travel to operational bridgehead | 225 Seconds | 3 Minutes 45 Seconds |
| Firefighter Travel Walking Up Two Flights Of Stairs To Fire Floor (75 Seconds) | 75 Seconds | 1 Minute 15 Seconds |
| **Total Time** | **1,220 Seconds** | **20 Minutes 20 Seconds** |

## Nearest Fire Station

Oldbury Fire Station
Address: Old Park Lane, Oldbury, B69 4PU
Distance: 2.4 miles

# Wall Constructions

| Wall Construction | Build-up |
|---|---|
| **Masonry (Brickwork) (AVA17E)** | • External Surface Material (Brickwork)<br>• Cavity<br>• Substrate (Original brickwork) |
| **Aluminium Cladding System (ZXG8FM)** | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
| **Terracotta Rainscreen System (H7MLZR)** | • External Surface Material (Terracotta Tile)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
| **Aluminium Spandrel Panel (QX98ZF)** | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Insulation (PIR Insulation)<br>• Internal Lining |

# Wall Construction: Masonry (Brickwork)

Construction Reference
AVA17E

This wall construction was identified by wall inspections T25BTE, EIF3LA, and B8QK8L. The build-up, cavity barrier, and floor slab information is taken directly from inspection T25BTE. See the Inspections section of this report for full inspection details.

| Construction | Effect | Risk |
|---|---|---|
| Masonry (Brickwork) (AVA17E) | Positive | Low |

## Build-Up

| 3 Elements | Thickness/Depth | Material | Rating (BS EN13501) |
|---|---|---|---|
| External Surface Material | 102mm | Brickwork | A1 - Non-Combustible |
| Cavity | 210mm | | |
| Substrate | | Original brickwork | A1 - Non-Combustible |

## Cavity Barriers

No cavity barrier identified at this inspection location

## Floor Slab

Backing Wall Sits On The Floor Slab

# Fire Performance

## K.1 General

Materials with a calorific value (gross heat of combustion) of ≤3 MJ/kg — Positive

## K.2 External Surfaces

Class A1 — Positive

## K.3 Facings/Cladding Panels

Low HRR — Positive

## K.4 Panel Construction

Not Applicable

## K.5 Cavities

Facings into the cavity at least Class A2 — Positive

## K.6 Insulation

Mineral wool insulation — Positive

## K.7 Substrate

Masonry, >75 mm thick — Positive

## K.8 Sheathing Boards

Not Applicable

## K.9 Insulated Core Panels

Not Applicable

## K.10 ETICS

Not Applicable

## K.11 Infill / Spandrel Panels

Not Applicable

## K.12 Internal Finishes

Plasterboard
Note: The plasterboard can not be confirmed to be installed as per the manufacturers instructions or ensure its method of fixing

Neutral

# PAS Standard Benchmark

## L7 Benchmark

DOUBLE SKIN MASONRY

As set out previously in this PAS, a building whose external walls are composed exclusively of this form of construction is not ordinarily expected to require an FRAEW. However, it is recognized that this form of wall construction might be mixed with other forms of wall construction.
This form of construction constitutes the lowest risk form of construction that might be used for external walls, for the following reasons.
• Each leaf of the wall, provided it is formed of masonry/concrete at least 75 mm thick and is generally well constructed, is likely to provide at least 30 min fire resistance.
• The masonry/concrete is likely to be of limited combustibility or better.

Given the above, this form of construction is invariably accepted as:
• not requiring cavity barriers generally, except that cavity closers are needed so that there is no free flow of air through the cavity; and
• being able to accommodate combustible materials within the cavity irrespective of building height.

This is illustrated in Diagram 8.2 in ADB Volume 1:2019 [8]. The equivalent diagram in Volume 2:2019 [9] is Diagram 9.2.

## BR135 Benchmark

We have compared this external wall type to the cladding systems found on the BR135 database and we did not find a cladding system with the configuration and components that would constitute an exact match to what our inspections found on the Property. Therefore, a BR135 benchmark would not be applicable for this external wall type

# Wall Construction: Aluminium Cladding System

Construction Reference
ZXG8FM

This wall construction was identified by wall inspections NSWVUT, 4YYTY3, YR28CF, and FJINUT. The build-up, cavity barrier, and floor slab information is taken directly from inspection NSWVUT. See the Inspections section of this report for full inspection details.

| Construction | Effect | Risk |
|---|---|---|
| Aluminium Cladding System (ZXG8FM) | Positive | Low |

## Build-Up

| 5 Elements | Thickness/Depth | Material | Rating (BS EN13501) |
|---|---|---|---|
| External Surface Material | 3mm | Aluminium Panel | A2 - Limited Combustibility |
| Framework | 30mm | Aluminium L/T Rail | A2 - Limited Combustibility |
| Cavity | 105mm | | |
| Insulation | 100mm | Mineral Wool Insulation | A1 - Non-Combustible |
| Substrate | | Original brickwork | A1 - Non-Combustible |

## Cavity Barriers

| 1 Cavity Barrier | Material |
|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces and intumescent strip leading edge<br>Material Brand: Rockwool |

# Floor Slab

Backing Wall Sits On The Floor Slab

# Fire Performance

## K.1 General

| | |
|---|---|
| Materials with a calorific value (gross heat of combustion) of ≤3 MJ/kg | Positive |

## K.2 External Surfaces

| | |
|---|---|
| Class A2 | Positive |

## K.3 Facings/Cladding Panels

| | |
|---|---|
| Low HRR | Positive |
| Mechanically fixed | Positive |

## K.4 Panel Construction

| | |
|---|---|
| Limited size of gaps between panels (Typically <10 mm) | Neutral |

## K.5 Cavities

| | |
|---|---|
| Cavities closed at least at compartment floors and walls but not:<br>• around windows and other openings*; or<br>• at ventilation ducts, grilles or other openings for services | Neutral |

## K.6 Insulation

| | |
|---|---|
| Mineral wool insulation | Positive |

## K.7 Substrate

Masonry, >75 mm thick

Positive

## K.8 Sheathing Boards

Not Applicable

## K.9 Insulated Core Panels

Not Applicable

## K.10 ETICS

Not Applicable

## K.11 Infill / Spandrel Panels

Not Applicable

## K.12 Internal Finishes

Plasterboard
Note: The plasterboard can not be confirmed to be installed as per the manufacturers instructions or ensure its method of fixing

Neutral

# PAS Standard Benchmark

## L9 Benchmark

CASSETTE PANELS -

Cassettes are generally used for both their aesthetic performance (reducing angles at which it is possible to see into cavity) and weather performance (minimizing water ingress to cavity), particularly where the material being used is relatively thin (e.g. metal sheets and composites).

Where a composite is used to form cassettes, the surface of the composite is likely to be broken on the insides of folds, so as to facilitate the formation of a clean fold. This exposes the underlying components of the composite so that it can be directly attacked by fire. If the underlying materials are readily combustible or have a low melting point, it can also lead to delamination of any portions of the cassette which are separated from fixing points by these folds, exposing more of the underlying material.

Some cassettes can also be formed by fixing elements together, rather than simply folding a sheet into the desired shape. Where this occurs the manner of fixing needs to be assessed to determine whether it is likely to fail prematurely in the event of fire.

The returns on cassettes need to be checked to determine whether there is sufficient cavity barrier detailing (or fire stopping) to mitigate the risk of fire circumventing the cavity barrier. The channel between cassettes can be open, but any spaces in the cavity need to be addressed, whether by fully filling or with an appropriate intumescent
solution.

Where cassettes have a particularly complex shape, particularly where that shape does not run parallel to the line to which cavity barriers are fixed, external wall assessors need to check that the cavity barrier fits or is able to close properly onto the inside face of the cassette along its entire length.

Where test evidence is available for a cassette, assessors need to check that it is relevant to the cassette, and not just to the material in flat panel form.

## BR135 Benchmark

We have compared this external wall type to the cladding systems found on the BR135 database and we did not find a cladding system with the configuration and components that would constitute an exact match to what our inspections found on the Property. Therefore, a BR135 benchmark would not be applicable for this external wall type

# Wall Construction: Terracotta Rainscreen System

Construction Reference
H7MLZR

This wall construction was identified by wall inspections A7TMAS, 3MFYIX, GLH33H, 9PIF5W, and 4ZXEVK. The build-up, cavity barrier, and floor slab information is taken directly from inspection A7TMAS. See the Inspections section of this report for full inspection details.

| Construction | Effect | Risk |
|---|---|---|
| Terracotta Rainscreen System (H7MLZR) | Positive | Low |

## Build-Up

| 5 Elements | Thickness/Depth | Material | Rating (BS EN13501) |
|---|---|---|---|
| External Surface Material | 15mm | Terracotta Tile | A1 - Non-Combustible |
| Framework | 30mm | Aluminium L/T Rail | A2 - Limited Combustibility |
| Cavity | | | |
| Insulation | 100mm | Mineral Wool Insulation | A1 - Non-Combustible |
| Substrate | | Original brickwork | A1 - Non-Combustible |

## Cavity Barriers

| 1 Cavity Barrier | Material |
|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces |

# Floor Slab

Backing Wall Sits On The Floor Slab

# Fire Performance

## K.1 General

| | |
|---|---|
| Materials with a calorific value (gross heat of combustion) of ≤3 MJ/kg | Positive |

## K.2 External Surfaces

| | |
|---|---|
| Class A1 | Positive |

## K.3 Facings/Cladding Panels

| | |
|---|---|
| Low HRR | Positive |
| Mechanically fixed | Positive |

## K.4 Panel Construction

| | |
|---|---|
| Limited size of gaps between panels (Typically <10 mm) | Neutral |

## K.5 Cavities

| | |
|---|---|
| Cavities closed at least at compartment floors and walls but not:<br>• around windows and other openings*; or<br>• at ventilation ducts, grilles or other openings for services | Neutral |

## K.6 Insulation

| | |
|---|---|
| Mineral wool insulation | Positive |

## K.7 Substrate

Masonry, >75 mm thick

Positive

## K.8 Sheathing Boards

Not Applicable

## K.9 Insulated Core Panels

Not Applicable

## K.10 ETICS

Not Applicable

## K.11 Infill / Spandrel Panels

Not Applicable

## K.12 Internal Finishes

Plasterboard
Note: The plasterboard can not be confirmed to be installed as per the manufacturers instructions or ensure its method of fixing

Neutral

# PAS Standard Benchmark

## L9 Benchmark

NON-COMBUSTIBLE and LIMITED COMBUSTIBILITY MATERIALS -

These materials can be subdivided into two categories; those which retain their shape when exposed to fire and those which do not.
• Natural stone, terracotta and non-combustible boards all generally remain in situ for a significant period of time when exposed to a fire plume emitting from a building (though they might eventually shatter), thus affording some protection to the underlying construction.
• Metals, depending upon their softening/melting temperature, might remain in situ or might soften, melt, or even rapidly oxidize, exposing the underlying construction to fire.

## BR135 Benchmark

We have compared this external wall type to the cladding systems found on the BR135 database and we did not find a cladding system with the configuration and components that would constitute an exact match to what our inspections found on the Property. Therefore, a BR135 benchmark would not be applicable for this external wall type

# Wall Construction: Aluminium Spandrel Panel

Construction Reference
QX98ZF

This wall construction was identified by wall inspection C6H63D. The build-up, cavity barrier, and floor slab information is taken directly from inspection C6H63D. See the Inspections section of this report for full inspection details.

| Construction | Effect | Risk |
|---|---|---|
| Aluminium Spandrel Panel (QX98ZF) | Neutral | Low |

## Build-Up

| 4 Elements | Thickness/Depth | Material | Rating (BS EN13501) |
|---|---|---|---|
| External Surface Material | 2mm | Aluminium Panel | A2 - Limited Combustibility |
| Framework | | Aluminium L/T Rail | A2 - Limited Combustibility |
| Insulation | 180mm | PIR Insulation | C - Combustible |
| Double insulated board | | | |
| Internal Lining | | | A2 - Limited Combustibility |
| Aluminium panels | | | |

## Cavity Barriers

| 1 Cavity Barrier | Material |
|---|---|
| Horizontal Cavity Barrier | Solid State Mineral Wool |

# Floor Slab

Reinforced concrete

# Fire Performance

## K.1 General

| | |
|---|---|
| Materials with a calorific value (gross heat of combustion) >3 MJ/kg and ≤35 MJ/kg | Neutral |

## K.2 External Surfaces

| | |
|---|---|
| Class A2 | Positive |

## K.3 Facings/Cladding Panels

| | |
|---|---|
| Low HRR | Positive |
| Mechanically fixed | Positive |

## K.4 Panel Construction

| | |
|---|---|
| Limited size of gaps between panels (Typically <10 mm) | Neutral |

## K.5 Cavities

| | |
|---|---|
| Cavities closed at least at compartment floors and walls but not:<br>• around windows and other openings*; or<br>• at ventilation ducts, grilles or other openings for services | Neutral |

## K.6 Insulation

| | |
|---|---|
| Thermoset polymeric foams that form a stable char on fire exposure, e.g. some PIR foams | Neutral |

## K.7 Substrate

Unknown, believed to be an aluminium panel.

Neutral

## K.8 Sheathing Boards

Not Applicable

## K.9 Insulated Core Panels

Not Applicable

## K.10 ETICS

Not Applicable

## K.11 Infill / Spandrel Panels

Thermoset polymeric foams that form a stable char under fire exposure (e.g. phenolic and some PIRs) faced on front and rear with Class A1/A2 materials (this could include laminated glass on the front face)

Neutral

## K.12 Internal Finishes

Plasterboard
Note: The plasterboard can not be confirmed to be installed as per the manufacturers instructions or ensure its method of fixing

Neutral

# PAS Standard Benchmark

## L5 Benchmark

SPANDREL / IN-FILL PANELS

The terms “spandrel panel” and “infill panel” are used interchangeably throughout the industry to refer to panels which are normally fitted in lieu of glazing in either window fenestration systems or curtain wall units. The edges of these panels usually expose the insulating core and are normally only protected by the frame into which they are installed. They are sometimes protected with aluminium foil tape but this cannot be assumed.
Spandrel and infill panels are typically some form of composite, such as:
• metal skins with an insulating core;
• metal skins with an insulating and timber (typically plywood) core;
• metal external face with insulating core and timber (typically plywood) internal face;
• HPL skins with an insulating core; and
• solid HPL.
Their performance needs to be assessed in light of the materials involved in their construction (as described in this annex) and the manner in which they interact with compartmentation.
• Panels which are installed in such a way as to cross compartment lines (e.g. to conceal the edges of floor slabs) need to be considered in light of the potential route they provide for fire to spread from one compartment to another.
• Panels which are installed entirely within the confines of a compartment (as it meets the external wall) are unlikely to have a significant impact on fire spread, unless their performance is such that they are likely to contribute to substantial flame extension.

## BR135 Benchmark

We have compared this external wall type to the cladding systems found on the BR135 database and we did not find a cladding system with the configuration and components that would constitute an exact match to what our inspections found on the Property. Therefore, a BR135 benchmark would not be applicable for this external wall type

# Façade Configuration: R1CSSZ

## Items in Façade

| 3 Items | Effect | Risk |
|---|---|---|
| Wall Construction<br>Masonry (Brickwork) (AVA17E) | Positive | Low |
| External Door<br>Single Leaf Entrance Doors (KBR2LB) | Neutral | Low |
| External Window<br>Top, Mid, Side Hung Casements (6MJ9Q4) | Neutral | Low |

## Façade Configuration Risk Factors

### N.1 Building Height

18 m to 30 m

Negative

### N.2 Height of Base of Cladding (Above Ground)

<2 m
NOTE At this height, the likelihood of a fire originating externally (e.g. involving a parked vehicle or waste skip started either accidently or deliberately) igniting the cladding is highly likely.

Negative

### N.3 Extent of Cladding

Limited in extent and not vertically aligned, such as to delay significantly fire spread to windows and other openings on upper levels

Positive

### N.4 Cavities & Openings

Cavity not continuous, due to façade being only partially clad or broken by building features:
• projecting floor slabs that divide part of the wall and isolate sections of cavity from each other; and
• walls that project out or are set back, such as to limit the vertical extent of cavities)

Positive

## N.5 Infill / Spandrel Panels

Not Applicable

## N.6 Setbacks - Combustible Cladding Setback from Wall Edge

Not Applicable

## N.7 Overhangs & Projections

Not Applicable

## N.8 Proximity to Windows and Other Openings to the Accommodation

Horizontally adjacent to windows and openings, and vertically in line with such openings, such that fire and smoke spread into the buildings, causing secondary fires, as a result of direct flame impingement, is highly likely

Negative

## N.9 Presence of vents or other openings for services in the Façade

Where vents pass through a cavity, either:
• the cavity does not include combustible materials; or
• the cavity is faced on either side by brick or concrete at least 75 mm thick and any combustible insulation in the cavity is not thermoplastic

Positive

## N10. Proximity of Combustible Elements of a Façade to Escape Route Windows & Other Openings

No combustible elements

Positive

## N.11 Attachments

Not Applicable

## N.12 Proximity of Combustible Elements of a Façade to a Neighbouring Building

Windows or other openings in adjacent or abutting neighbouring buildings are sufficiently distanced that direct flame impingement from a fire in the neighbouring building is unforeseeable

Neutral

# Risk Factor Analysis

**Conclusion**: This wall system is comprised of a double-leaf masonry system. In some sample locations it was observed to contain approximately 200mm of mineral wool insulation. In another location the cavity was observed to be void of any insulation. The outer leaf of masonry was identified as 102mm brickwork and the inner leaf was observed to be 100mm blockwork.

Masonry brickwork is generally considered fire-resistant and can provide significant protection against fire for structural and non-structural elements. Masonry bricks, typically made from clay or concrete, have very high melting points (above 1000°C for clay bricks), making them resistant to fire and heat. Bricks have low thermal conductivity. This helps prevent the spread of fire to adjacent areas and provides a thermal barrier that protects the underlying structure. Masonry walls provide effective fire containment, often preventing fire from spreading between compartments within a building. The thickness and density of the masonry wall determine its fire resistance rating.

Mineral wool, which includes materials like stone wool, is known for its excellent fire-resistant properties. Mineral wool has a very high melting point, typically around 1,000°C to 1,200°C. This makes it non-combustible, meaning it does not contribute to the spread of fire. In the event of a fire, mineral wool acts as a thermal barrier. Its fibrous structure traps air, reducing the transmission of heat to other parts of the structure and slowing the spread of fire. Mineral wool maintains its insulation properties and shape even at high temperatures, further protecting the structural components of buildings, like steel, from heat damage.

As set out in PAS9980, a building whose external walls are composed exclusively of this form of construction is not ordinarily expected to require an FRAEW. However, it is recognised that this form of wall construction might be mixed with other forms of wall construction. This form of construction constitutes the lowest risk form of construction that might be used for external walls, for the following reasons.
• Each leaf of the wall, provided it is formed of masonry/concrete at least 75 mm thick and is generally well constructed, is likely to provide at least 30 min fire resistance.
• The masonry/concrete is likely to be of limited combustibility or better.

Given the above, this form of construction is invariably accepted as:
• not requiring cavity barriers generally, except that cavity closers are needed so that there is no free flow of air through the cavity; and
• being able to accommodate combustible materials within the cavity irrespective of building height

No dedicated cavity barriers were identified within the wall system; however, it was observed that the cavity was fully filled with mineral wool, effectively disrupting the mechanism for vertical fire spread within the cavity.

This wall system forms the facade of the ground floor and spans the entire perimeter of the building. Structural openings in the facade include windows opening into the accommodation and is adjacent to the entrance/exit doors. Given the non-combustibility of the materials used to form the outer and inner leaf of the system, an externally venting fire from a compartment would not be expected to spread across this wall type, and the likelihood of an external fire igniting this wall type is also low.

This building operates a 'Stay Put' evacuation policy. It is anticipated that, due to the nature of the building's construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Low

# Façade Configuration: AR8WVK

## Items in Façade

| 2 Items | Effect | Risk |
|---|---|---|
| Wall Construction<br>Aluminium Cladding System (ZXG8FM) | Positive | Low |
| External Window<br>Top, Mid, Side Hung Casements (6MJ9Q4) | Neutral | Low |

## Façade Configuration Risk Factors

### N.1 Building Height

18 m to 30 m

Negative

### N.2 Height of Base of Cladding (Above Ground)

2 m to 5 m
NOTE At this height, the scope for a fire originating externally (e.g. involving a parked vehicle or waste skip started either accidently or deliberately) igniting the cladding is considered possible, but not likely at an early stage in the development of the fire.

Neutral

### N.3 Extent of Cladding

Limited in extent such as to delay fire spread over the external walls

Neutral

### N.4 Cavities & Openings

Cavity not continuous, due to façade being only partially clad or broken by building features:
• projecting floor slabs that divide part of the wall and isolate sections of cavity from each other; and
• walls that project out or are set back, such as to limit the vertical extent of cavities)

Neutral

## N.5 Infill / Spandrel Panels

In a vertical continuous line with windows such as to increase the likelihood of secondary fires

Negative

## N.6 Setbacks - Combustible Cladding Setback from Wall Edge

Not Applicable

## N.7 Overhangs & Projections

Not Applicable

## N.8 Proximity to Windows and Other Openings to the Accommodation

Horizontally adjacent to windows and openings, and vertically in line with such openings, such that fire and smoke spread into the buildings, causing secondary fires, as a result of direct flame impingement, is highly likely

Negative

## N.9 Presence of vents or other openings for services in the Façade

Where vents pass through a cavity, either:
• the cavity does not include combustible materials; or
• the cavity is faced on either side by brick or concrete at least 75 mm thick and any combustible insulation in the cavity is not thermoplastic

Positive

## N10. Proximity of Combustible Elements of a Façade to Escape Route Windows & Other Openings

No combustible elements

Positive

## N.11 Attachments

Not Applicable

## N.12 Proximity of Combustible Elements of a Façade to a Neighbouring Building

| | |
|---|---|
| Windows or other openings in adjacent or abutting neighbouring buildings are sufficiently distanced that direct flame impingement from a fire in the neighbouring building is unforeseeable | Neutral |

# Risk Factor Analysis

**Conclusion**: This wall system is comprised of a 3mm aluminium panel affixed to an aluminium rail system. Beneath this is 100mm mineral wool insulation and the original brickwork.

Although aluminium is generally considered to be of limited combustibility, it is recognised as having a lower melting point than other metals used in construction. This may mean that in scenarios resulting in prolonged exposure to fire where temperatures exceed 600 degrees the material may begin to lose its structural integrity.

Mineral wool, which includes materials like stone wool, is known for its excellent fire-resistant properties. Mineral wool has a very high melting point, typically around 1,000°C to 1,200°C. This makes it non-combustible, meaning it does not contribute to the spread of fire. In the event of a fire, mineral wool acts as a thermal barrier. Its fibrous structure traps air, reducing the transmission of heat to other parts of the structure and slowing the spread of fire. Mineral wool maintains its insulation properties and shape even at high temperatures, further protecting the structural components of buildings, like steel, from heat damage.

Masonry brickwork is generally considered fire-resistant and can provide significant protection against fire for structural and non-structural elements. Masonry bricks, typically made from clay or concrete, have very high melting points (above 1000°C for clay bricks), making them resistant to fire and heat. Bricks have low thermal conductivity. This helps prevent the spread of fire to adjacent areas and provides a thermal barrier that protects the underlying structure. Masonry walls provide effective fire containment, often preventing fire from spreading between compartments within a building. The thickness and density of the masonry wall determine its fire resistance rating.

Horizontal Rockwool cavity barriers were identified in all sample locations. These were observed to be intumescent in order to close the air cavity under fire conditions.

This wall system forms continuous vertical sections in line with the windows of the building. They begin at ground floor and extend the full height of the building. Structural openings in the facade include windows opening into the accommodation. Given the limited combustibility of the materials used to form the system, an externally venting fire from a compartment would not be expected to spread across this wall type, and the likelihood of an external fire igniting this wall type is also low. The adjacent terracotta tiling system is also non-combustible.

This building operates a ‘Stay Put’ evacuation policy. It is anticipated that, due to the nature of the building’s construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in

time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Low

# Façade Configuration: WWNQTK

## Items in Façade

| 2 Items | Effect | Risk |
|---|---|---|
| Wall Construction<br>Terracotta Rainscreen System (H7MLZR) | Positive | Low |
| External Window<br>Top, Mid, Side Hung Casements (6MJ9Q4) | Neutral | Low |

## Façade Configuration Risk Factors

### N.1 Building Height

18 m to 30 m — Negative

### N.2 Height of Base of Cladding (Above Ground)

2 m to 5 m
NOTE At this height, the scope for a fire originating externally (e.g. involving a parked vehicle or waste skip started either accidently or deliberately) igniting the cladding is considered possible, but not likely at an early stage in the development of the fire. — Neutral

### N.3 Extent of Cladding

Limited in extent such as to delay fire spread over the external walls — Neutral

### N.4 Cavities & Openings

Continuous vertically running cavity with cavity barriers or fire stops as appropriate — Positive

### N.5 Infill / Spandrel Panels

Not Applicable

## N.6 Setbacks - Combustible Cladding Setback from Wall Edge

Not Applicable

## N.7 Overhangs & Projections

Not Applicable

## N.8 Proximity to Windows and Other Openings to the Accommodation

Horizontally adjacent to windows and openings, and vertically in line with such openings, such that fire and smoke spread into the buildings, causing secondary fires, as a result of direct flame impingement, is highly likely

Negative

## N.9 Presence of vents or other openings for services in the Façade

Not Applicable

## N10. Proximity of Combustible Elements of a Façade to Escape Route Windows & Other Openings

No combustible elements

Positive

## N.11 Attachments

Not Applicable

## N.12 Proximity of Combustible Elements of a Façade to a Neighbouring Building

Windows or other openings in adjacent or abutting neighbouring buildings are sufficiently distanced that direct flame impingement from a fire in the neighbouring building is unforeseeable

Neutral

# Risk Factor Analysis

**Conclusion**: This wall system is comprised of a 15mm terracotta tile affixed to an aluminium rail system. Beneath this is 100mm mineral wool insulation and the original brickwork.

The terracotta tiles are generally considered to be non-combustible due to the nature of their composition and would not be expected so sustain, support, or contribute to fire spread across the external surface of the building.

Although aluminium is generally considered to be of limited combustibility, it is recognised as having a lower melting point than other metals used in construction. This may mean that in scenarios resulting in prolonged exposure to fire where temperatures exceed 600 degrees the material may begin to lose its structural integrity.

Mineral wool, which includes materials like stone wool, is known for its excellent fire-resistant properties. Mineral wool has a very high melting point, typically around 1,000°C to 1,200°C. This makes it non-combustible, meaning it does not contribute to the spread of fire. In the event of a fire, mineral wool acts as a thermal barrier. Its fibrous structure traps air, reducing the transmission of heat to other parts of the structure and slowing the spread of fire. Mineral wool maintains its insulation properties and shape even at high temperatures, further protecting the structural components of buildings, like steel, from heat damage.

Masonry brickwork is generally considered fire-resistant and can provide significant protection against fire for structural and non-structural elements. Masonry bricks, typically made from clay or concrete, have very high melting points (above 1000°C for clay bricks), making them resistant to fire and heat. Bricks have low thermal conductivity. This helps prevent the spread of fire to adjacent areas and provides a thermal barrier that protects the underlying structure. Masonry walls provide effective fire containment, often preventing fire from spreading between compartments within a building. The thickness and density of the masonry wall determine its fire resistance rating.

Rockwool cavity barriers were identified in all sample locations. These were observed to be intumescent in order to close the air cavity under fire conditions.

This wall system forms continuous vertical sections adjacent to the aluminium panel system. They begin on the first floor and extend the full height of the building. There are no structural openings in this wall type. Given the limited combustibility of the materials used to form the system, an externally venting fire from a compartment would not be expected to spread across this wall type, and the likelihood of an external fire igniting this wall type is also low. The adjacent aluminium system is also non-combustible and as such fire would not be expected to spread between the wall systems.

This building operates a ‘Stay Put’ evacuation policy. It is anticipated that, due to the nature of the building’s construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Low

# Façade Configuration: LCC8CD

## Items in Façade

| 2 Items | Effect | Risk |
|---|---|---|
| Wall Construction<br>Aluminium Spandrel Panel (QX98ZF) | Neutral | Low |
| External Window<br>Top, Mid, Side Hung Casements (6MJ9Q4) | Neutral | Low |

## Façade Configuration Risk Factors

### N.1 Building Height

18 m to 30 m — Negative

### N.2 Height of Base of Cladding (Above Ground)

2 m to 5 m
NOTE At this height, the scope for a fire originating externally (e.g. involving a parked vehicle or waste skip started either accidently or deliberately) igniting the cladding is considered possible, but not likely at an early stage in the development of the fire. — Neutral

### N.3 Extent of Cladding

Limited in extent such as to delay fire spread over the external walls — Neutral

### N.4 Cavities & Openings

Cavity not continuous, due to façade being only partially clad or broken by building features:
• projecting floor slabs that divide part of the wall and isolate sections of cavity from each other; and
• walls that project out or are set back, such as to limit the vertical extent of cavities) — Neutral

## N.5 Infill / Spandrel Panels

In a vertical continuous line with windows such as to increase the likelihood of secondary fires

Negative

## N.6 Setbacks - Combustible Cladding Setback from Wall Edge

Not Applicable

## N.7 Overhangs & Projections

Not Applicable

## N.8 Proximity to Windows and Other Openings to the Accommodation

Remote from windows and openings, such that fire and smoke spread into the building, causing secondary fires, is not possible

Positive

## N.9 Presence of vents or other openings for services in the Façade

Not Applicable

## N10. Proximity of Combustible Elements of a Façade to Escape Route Windows & Other Openings

Adjacent to windows and openings, such that fire and smoke spread into the escape routes to give rise to untenable conditions is likely and there is only one escape for some or all occupants

Negative

## N.11 Attachments

Not Applicable

## N.12 Proximity of Combustible Elements of a Façade to a Neighbouring Building

Windows or other openings in adjacent or abutting neighbouring buildings are sufficiently distanced that direct flame impingement from a fire in the neighbouring building is unforeseeable

Neutral

# Risk Factor Analysis

**Conclusion**: The spandrel panel system is comprised of a 2mm aluminium panel affixed to an aluminium rail system. Within this sits approximately 180mm PIR foam insulation and a second aluminium panel.

Although aluminium is generally considered to be of limited combustibility, it is recognised as having a lower melting point than other metals used in construction. This may mean that in scenarios resulting in prolonged exposure to fire where temperatures exceed 600 degrees the material may begin to lose its structural integrity.

The PIR (Polyisocyanurate) is viewed as presenting a medium risk to the contribution to fire spread. PIR insulation is less combustible and has better fire performance compared to some other foam insulations. It ignites at temperatures typically around 300°C to 400°C, forms a protective char layer which helps to insulate and protect the underlying material, and generally produces less smoke and toxic gases. However, it can still contribute to fire growth and produce hazardous gases when it burns. It should be noted that the final fire performance of plastic foams such as PIR strongly depends on the chemical composition and manufacturing process. e.g., content of isocyanate linkages and type of isocyanate-reactive component for PIR.

A solid state mineral wool cavity barrier was identified at floor slab level that will act to prevent or delay the spread of fire between compartments/floors.

This wall system sits at floor level as part of the curtain wall forming the external surface of the escape staircase. It begins at the first floor level and extends the full height of the building. Structural openings in the facade include windows opening into the escape staircase. The adjacent wall systems of terracotta tiling and aluminium panels are non-combustible and, as such, would not be expected to allow fire to spread to this wall type containing combustible insulation. Due to this wall type beginning at the first floor above the primary entrance, the likelihood of exposure to external sources of ignition is limited.

This building operates a 'Stay Put' evacuation policy. It is anticipated that, due to the nature of the building's construction, a fire would be contained within the compartment of origin long enough for firefighter intervention to begin or for affected occupants to evacuate if necessary. The building has 1 escape staircase with lobby protection serving all floors. The stairs are provided with adequate ventilation in the form of manually openable windows and an AOV for the control of smoke.A dry riser is fitted to the building with an outlet on every floor. There is adequate access for the fire service to the front and rear of the building. The nearest fire station is approximately 2.5 miles away, and as such, the response to a call out would be expected to be swift.

In the event of a fire;
a) fire spread is likely to be at a rate within expectations for a building of this height, given the circumstances at the building in question; and/or
b) fire spread is unlikely to give rise to widespread secondary fires resulting in occupants being significantly harmed or prevented from escaping; and/or
c) fire is unlikely to spread in such a way that the communal means of escape will be compromised before occupants can safely use them to escape; and/or
d) the fire and rescue service are likely to be able to intervene effectively to enable occupants to reach safety in time.

It is our professional opinion that there is no requirement for remediation of this wall type.


Medium

# APPENDIX

# Asset Information

## Client Name

Sandwell Metropolitan Council

## Client Address

Sandwell house, Freeth street, Oldbury, B69 3DB

## Contact Details

0121 569 5254

## Fire Alarm System

Early warning is limited to hard-wired or battery smoke alarms within each of the residents' flats. Based on the sample of properties accessed during the fire risk assessment the smoke alarms within residents' flats are installed to a minimum of LD3 Standard. There is no effective means for detecting an outbreak of fire to communal areas.

## Emergency Lighting

Installed in communal parts

## Emergency Lighting

Emergency lighting appears to conform to the requirements of BS5266-1 design standard. The system appears to provide adequate coverage and be in good working order (indicator lights active on luminaires). Luminaires appear to be correctly sited and appear to provide adequate lighting.

## Portable Fire Fighting Equipment

Portable Fire Fighting Equipment installed within staff only / Restricted areas of the building

## Portable Fire Fighting Equipment

Portable fire extinguisher is in the lift motor room.

## Smoke Control

Natural smoke control, Smoke control installed

## Smoke Control

The stairs and/or lobbies are provided with adequate permanent or manually operated ventilation openings for the control of smoke. Manual openable windows within the stairwell and the stairs and lobbies are provided with an automatic smoke ventilation system

## Suppression Systems

Partial sprinkler system installed (Detailed in Description)

## Suppression System

Sprinkler system installed within bin rooms only

## Fire Fighting Facilities

Dry Riser

## Fire Fighting Facilities

Dry riser outlets were located on each floor within the firefighting lobby area, ensuring accessible water supply for

firefighting operations. This placement allows for efficient connection of firefighting hoses, providing vital water access to emergency services during fire incidents across all floor levels.

## Access for fire-fighting vehicles

Adequate access for firefighting vehicles
NOTE This is where access is possible in line with benchmark guidance on access for firefighting vehicles from Approved Document B, taking into account the size of the building (floor area), height of the building and whether fire mains are present in the building.

## Fire Hydrant Location/ Water Supply

Public fire hydrant are available. The fire hydrant is adjacent the front entrance to the building (approx 5m) as detailed in the on arrival information.
Public fire hydrants can be located: https://dataservices.riscauthority.co.uk/map/index

## Housekeeping

Good standard. Means of escape clear. Refuse stored appropriately

## Secure Information Boxes

Secure information box (SIB) installed

## Signage

Appropriate signage installed throughout premises

## Property Type

Residential, General Needs

## Building Era / Age

Known Build Date

## Known Build Date

1964, Refurbished in 2007 and 2017

## Guidance Applicable At Time Of Construction

Model Byelaws 1953
Building Regulations 2000 and Approved Document B Volume 2 2006

## Building Height

Overall Building Height Approximately 25m
Highest Occupied Floor Level 21m
(calculated at 3m per floor as per PAS 9980-2022 section 3.1.22)

## Number of Storeys (Ground and above)

8

## Number of Flats

48

## Flat Types

Single Storey

## Structural Wall Material

Concrete / Brick

## Structural Floor Material

Reinforced Concrete

## Structural Stairs Material

Concrete

## Construction (Details)

Traditional concrete frame and brick construction

## Exterior Cladding

FRAEW Completed on Exterior Cladding

## Exterior Cladding (Details)

Terracotta tiles and aluminium panels

## Electronic Entrance System

Yes

## Carpark

External/Outdoor Carpark

## Employees

None

## Residents

Yes

## Approx number of Residents

96

## Residents (Extended)

Assumed to be two residents per flat (Exact numbers not known)

## Visitors

Not Known

## People With Reduced Mobility

Not Known

## Lone Workers

None

## Young Persons Employed in the Premises

None

## Escapes & Exits

There are sufficient fire exits from the premises of suitable width and within acceptable travel distances. These will allow all persons in the premises to evacuate safely in the event of fire. Emergency exits open outwards in escape direction.

## Number Of Internal Escape Stairs

1

## Number Of Final Exits

2

## External Means Of Escape

None Present

## Types Of Lifts Installed

Passenger + Fireman's Control

## Evacuation Chairs Installed

No

## Refuge Points Present

No

## Stairwells Protected / Lobbied

Yes

## Flat Doors Open Onto Stairs

No

## Current Evacuation Strategy

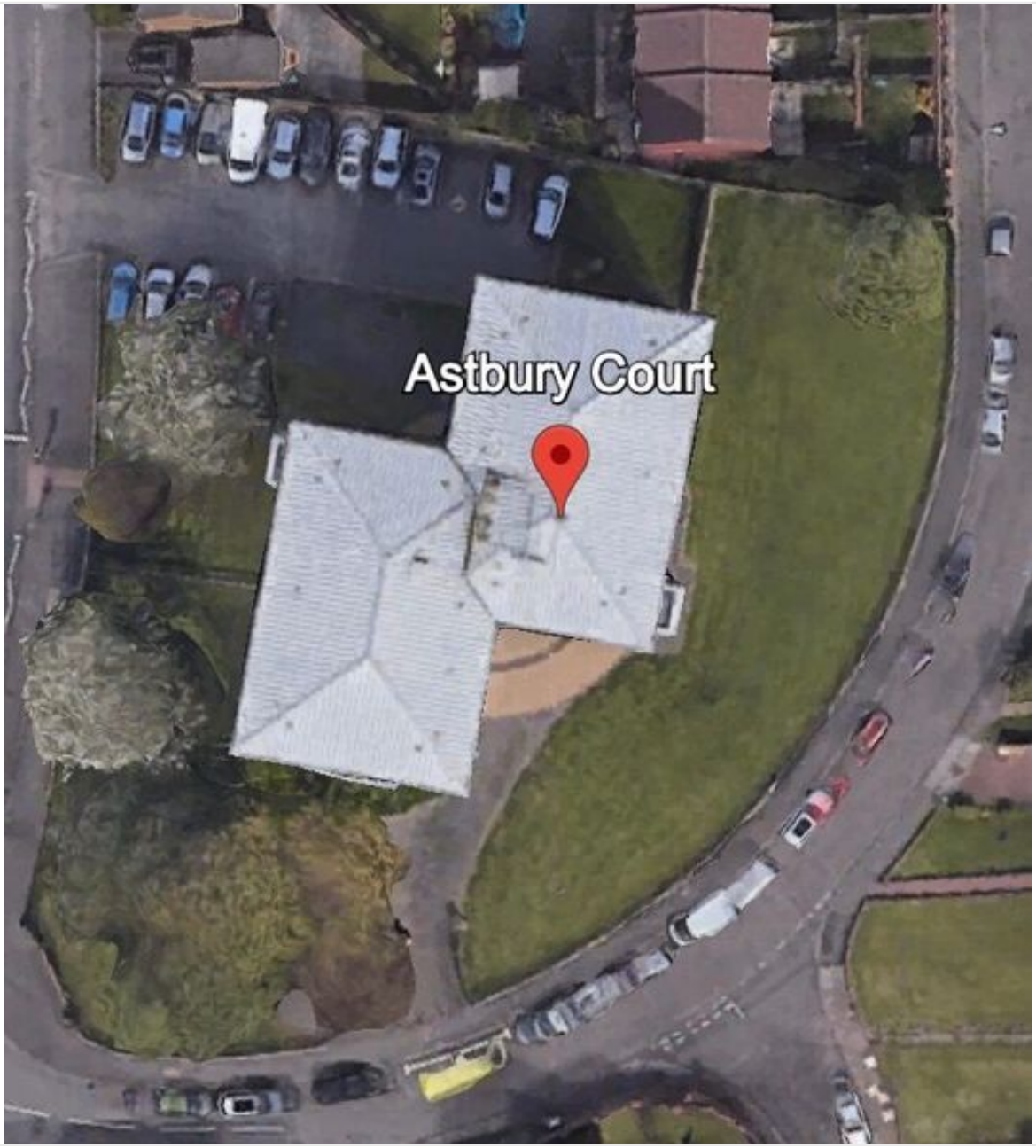
Stay Put

## Current Stay Put Strategy Description

The current evacuation strategy is Stay Put as denoted by the fire action notices displayed in the common area.

# Aerial Perspective: Astbury Court, Kingsway, Brandhill, B68 0QG

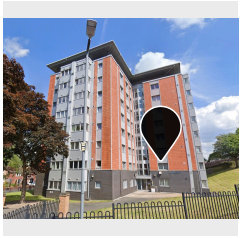
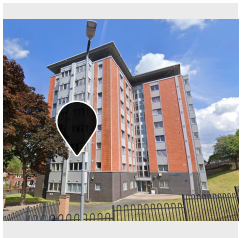
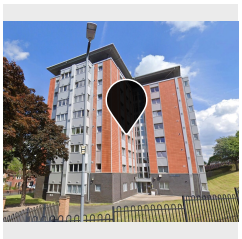
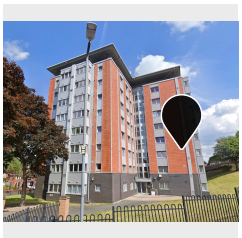
Aerial Perspective (picture sourced from Google Earth)

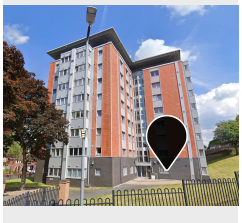
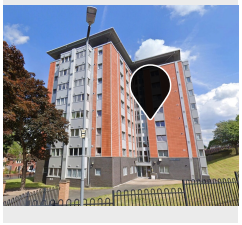
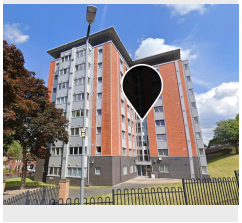


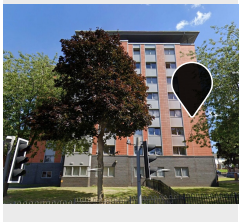
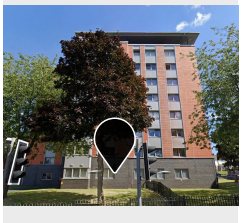
# Elevations

| Photo | Name | No. of Storeys |
|---|---|---|
|  | North Elevation | 9 Storeys |
|  | South Elevation | 9 Storeys |
|  | East Elevation | 9 Storeys |
|  | West Elevation | 9 Storeys |

# Inspections

| Elevation Location | Inspection | Elements |
|---|---|---|
|  | **Inspection: NSWVUT**<br>Wall Inspection<br>Compartment Floor Junction | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: 4YYTY3**<br>Wall Inspection<br>Compartment Floor Junction | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: YR28CF**<br>Wall Inspection<br>Compartment Floor Junction | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: A7TMAS**<br>Wall Inspection<br>Compartment Floor Junction | • External Surface Material (Terracotta Tile)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: 3MFYIX**<br>Wall Inspection<br>Ventilation Outlet | • External Surface Material (Terracotta Tile)<br>• Outer leaf<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Other (Expanding foam)<br>• Substrate (Original brickwork) |

| Elevation Location | Inspection | Elements |
|---|---|---|
|  | **Inspection: T25BTE**<br>Wall Inspection<br>Aperture Opening | • External Surface Material (Brickwork)<br>• Cavity<br>• Substrate (Original brickwork) |
|  | **Inspection: EIF3LA**<br>Wall Inspection<br>Aperture Opening | • External Surface Material (Brickwork)<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: GLH33H**<br>Wall Inspection<br>Compartment Floor and Wall Junction Interface | • External Surface Material (Terracotta Tile)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: C6H63D**<br>Wall Inspection<br>Aperture Opening | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Insulation (PIR Insulation)<br>• Internal Lining |
|  | **Inspection: FJINUT**<br>Wall Inspection<br>Aperture Opening | • External Surface Material (Aluminium Panel)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: 9PIF5W**<br>Wall Inspection<br>Compartment Wall Junction | • External Surface Material (Terracotta Tile)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |

| Elevation Location | Inspection | Elements |
| --- | --- | --- |
|  | **Inspection: 4ZXEVK**<br>Wall Inspection<br>Compartment Floor and Wall Junction Interface | • External Surface Material (Terracotta Tile)<br>• Framework (Aluminium L/T Rail)<br>• Cavity<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |
|  | **Inspection: B8QK8L**<br>Wall Inspection<br>Aperture Opening | • External Surface Material (Brickwork)<br>• Insulation (Mineral Wool Insulation)<br>• Substrate (Original brickwork) |

# Inspection: NSWVUT

Elevation • Location
Wall Inspection • Compartment Floor Junction

## Name/Summary

Aluminum Panel

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 3mm | Aluminium Panel | 12, 13 | A2 - Limited Combustibility |
| Framework | 30mm | Aluminium L/T Rail | 14 | A2 - Limited Combustibility |
| Cavity | 105mm | | 15 | |
| Insulation | 100mm | Mineral Wool Insulation | 16, 17 | A1 - Non-Combustible |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Substrate | | Original brickwork | 16 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces and intumescent strip leading edge<br>Material Brand: Rockwool | 18 |

Cavity closed at compartmentation wall

# Floor Slab

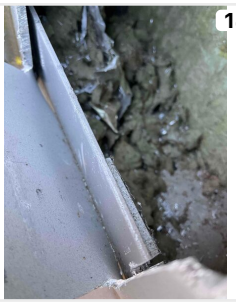
Backing Wall Sits On The Floor Slab

# Build-up Photos

12

13

14



15

16

17

16

## Cavity Barrier Photos


## Inspection Photos

# Inspection: 4YYTY3

Elevation • Location
Wall Inspection • Compartment Floor Junction

## Name/Summary

Aluminum Panel

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 3mm | Aluminium Panel | 20, 21 | A2 - Limited Combustibility |
| Framework | | Aluminium L/T Rail | 22 | A2 - Limited Combustibility |
| Cavity | 85mm | | 23 | |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Insulation | 100mm | Mineral Wool Insulation | 24, 25 | A1 - Non-Combustible |
| Attached via mechanical fixers | | | | |
| Substrate | | Original brickwork | 26 | A1 - Non-Combustible |

# Cavity Barriers

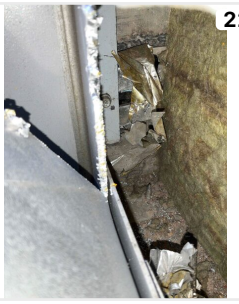
| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces and intumescent strip leading edge<br>Material Brand: Rockwool | 27 |

# Floor Slab

Backing Wall Sits On The Floor Slab

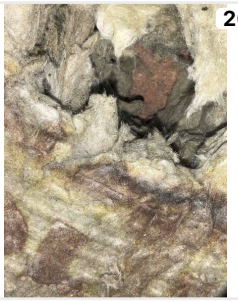
# Build-up Photos











# Cavity Barrier Photos

# Inspection: YR28CF

Elevation • Location
Wall Inspection • Compartment Floor Junction

## Name/Summary

Aluminum Panel

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 3mm | Aluminium Panel | 28, 29 | A2 - Limited Combustibility |
| Framework | 30mm | Aluminium L/T Rail | 30 | A2 - Limited Combustibility |
| Cavity | 100mm | | 31 | |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Insulation | 100mm | Mineral Wool Insulation | 32, 33 | A1 - Non-Combustible |
| Attached via mechanical fixers | | | | |
| Substrate | | Original brickwork | 34 | A1 - Non-Combustible |

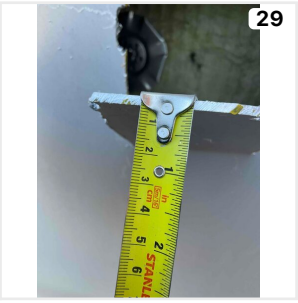
## Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces and intumescent strip leading edge<br>Material Brand: Rockwool | 35 |
| Cavity closed at compartmentation wall | | |

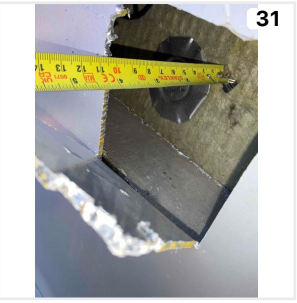
## Floor Slab

Backing Wall Sits On The Floor Slab

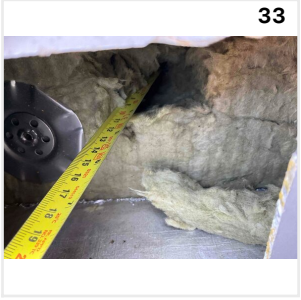
## Build-up Photos










## Cavity Barrier Photos


## Inspection Photos

# Inspection: A7TMAS

Elevation • Location
Wall Inspection • Compartment Floor Junction

## Name/Summary

Terracotta Rainscreen

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 15mm | Terracotta Tile | 37, 38 | A1 - Non-Combustible |
| Framework | 30mm | Aluminium L/T Rail | 39 | A2 - Limited Combustibility |
| Cavity | | | 40 | |
| Insulation | 100mm | Mineral Wool Insulation | 41, 42 | A1 - Non-Combustible |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Substrate | | Original brickwork | 43 | A1 - Non-Combustible |

## Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces | 44 |

Cavity closed at compartmentation wall

## Floor Slab

Backing Wall Sits On The Floor Slab

## Build-up Photos

37

38

39

40

41

42

43

## Cavity Barrier Photos


## Inspection Photos

# Inspection: 3MFYIX

Elevation • Location
Wall Inspection • Ventilation Outlet

## Name/Summary

Terracotta Rainscreen

## Description

Flue penetration not fire stopped

## Build-Up

| 7 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 5mm | Terracotta Tile | 46, 47 | A1 - Non-Combustible |
| Outer leaf | | Material Brand: Cement board | 48, 49 | B - Combustible |
| Framework | 30mm | Aluminium L/T Rail | 50, 51 | A2 - Limited Combustibility |
| Cavity | 80mm | | 52 | |
| Insulation | 100mm | Mineral Wool Insulation | 53, 54 | A1 - Non-Combustible |
| Other | | Expanding foam | 55 | F - Highly Combustible |
| Substrate | | Original brickwork | 56 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces | 57 |

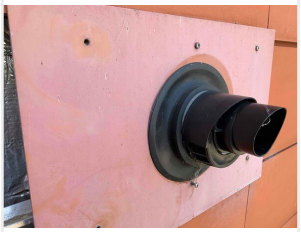
Cavity closed at compartmentation wall

# Floor Slab

Backing Wall Sits On The Floor Slab

# Build-up Photos

46



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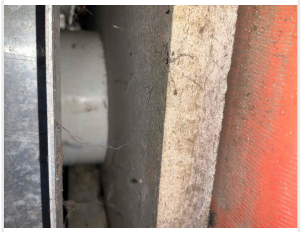

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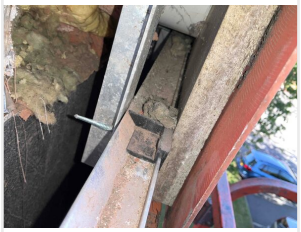

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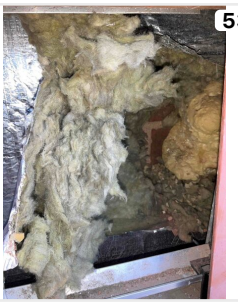
53



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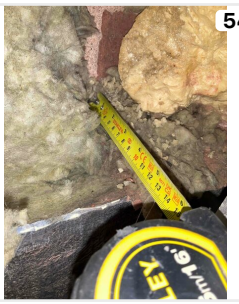

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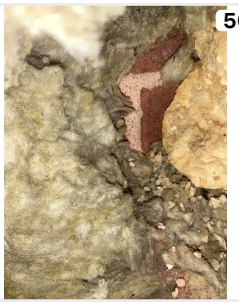


# Cavity Barrier Photos

57

# Inspection Photos

58

# Inspection: T25BTE

Elevation • Location
Wall Inspection • Aperture Opening

## Name/Summary

Masonry (Brickwork)

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 3 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 102mm | Brickwork | 59, 60 | A1 - Non-Combustible |
| Cavity | 210mm | | 61 | |
| Substrate | | Original brickwork | 62 | A1 - Non-Combustible |

# Cavity Barriers

No cavity barrier identified at this inspection location

# Floor Slab

Backing Wall Sits On The Floor Slab

# Build-up Photos





# Inspection Photos


# Inspection: EIF3LA

Elevation • Location
Wall Inspection • Aperture Opening

## Name/Summary

Masonry (Brickwork)

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 3 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 102mm | Brickwork | 65 | A1 - Non-Combustible |
| Insulation | 210mm | Mineral Wool Insulation | 66, 67 | A1 - Non-Combustible |
| Substrate | | Original brickwork | 68 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Window Aperture | Solid State Mineral Wool | 66 |

Cavity closed at the window opening

# Floor Slab

Backing Wall Sits On The Floor Slab

# Build-up Photos

65

66

67

68

# Cavity Barrier Photos

66

# Inspection Photos


# Inspection: GLH33H

Elevation • Location
Wall Inspection • Compartment Floor and Wall Junction Interface

## Name/Summary

Terracotta Rainscreen

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 15mm | Terracotta Tile | 71, 72 | A1 - Non-Combustible |
| Framework | 30mm | Aluminium L/T Rail | 73 | A2 - Limited Combustibility |
| Cavity | 135mm | | 74 | |
| Insulation | 100mm | Mineral Wool Insulation | 75, 76 | A1 - Non-Combustible |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Substrate | | Original brickwork | 77 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces | 78 |

Cavity closed at compartmentation wall

# Floor Slab

Backing Wall Sits On The Floor Slab

# Build-up Photos

71

72

73

74

75

76

77

# Cavity Barrier Photos

78

# Inspection: C6H63D

Elevation • Location
Wall Inspection • Aperture Opening

## Name/Summary

Aluminium Spandrel Panel

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 4 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 2mm | Aluminium Panel | 79, 80 | A2 - Limited Combustibility |
| Framework | | Aluminium L/T Rail | 81 | A2 - Limited Combustibility |
| Insulation | 180mm | PIR Insulation | 82 | C - Combustible |

Double insulated board

| 4 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Internal Lining | | | 83 | A2 - Limited Combustibility |
| Aluminium panels | | | | |

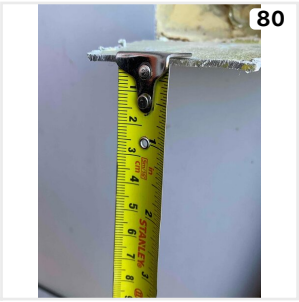
## Cavity Barriers

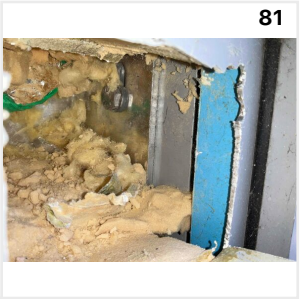
| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Solid State Mineral Wool | 84, 85 |
| Cavity sock at floor level | | |

## Floor Slab

Reinforced concrete

## Build-up Photos



# Cavity Barrier Photos

84

85

# Inspection: FJINUT

Elevation • Location
Wall Inspection • Aperture Opening

## Name/Summary

Aluminum Panel

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 3mm | Aluminium Panel | 86, 87 | A2 - Limited Combustibility |
| Framework | | Aluminium L/T Rail | 88 | A2 - Limited Combustibility |
| Cavity | 115mm | | 89 | |
| Insulation | 100mm | Mineral Wool Insulation | 90 | A1 - Non-Combustible |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Substrate | | Original brickwork | 90 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces and intumescent strip leading edge<br>Material Brand: Rockwool | 91 |

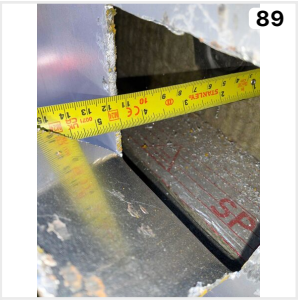
Cavity closed at compartmentation wall

# Floor Slab

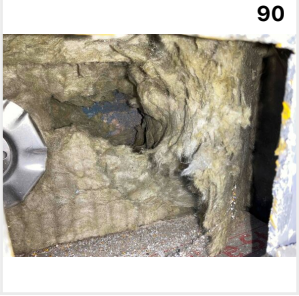
Backing Wall Sits On The Floor Slab

# Build-up Photos







# Cavity Barrier Photos

# Inspection: 9PIF5W

Elevation • Location
Wall Inspection • Compartment Wall Junction

## Name/Summary

Terracotta Rainscreen

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 15mm | Terracotta Tile | 92, 93 | A1 - Non-Combustible |
| Framework | 30mm | Aluminium L/T Rail | 94 | A2 - Limited Combustibility |
| Cavity | 115mm | | 95 | |
| Insulation | 100mm | Mineral Wool Insulation | 96 | A1 - Non-Combustible |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Substrate | | Original brickwork | 97 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces | 98 |

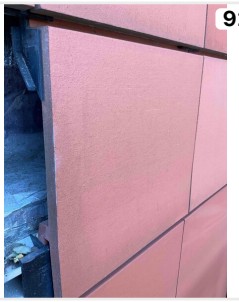
Cavity closed at compartmentation wall

# Floor Slab

Backing Wall Sits On The Floor Slab

# Build-up Photos

92



93

94

95

96

97

# Cavity Barrier Photos

98

# Inspection: 4ZXEVK

Elevation • Location
Wall Inspection • Compartment Floor and Wall Junction Interface

## Name/Summary

Terracotta Rainscreen

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 15mm | Terracotta Tile | 99, 100 | A1 - Non-Combustible |
| Framework | 30mm | Aluminium L/T Rail | 101, 102 | A2 - Limited Combustibility |
| Cavity | 120mm | | 103 | |
| Insulation | 100mm | Mineral Wool Insulation | 104, 105 | A1 - Non-Combustible |

| 5 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| Substrate | | Original brickwork | 106 | A1 - Non-Combustible |

# Cavity Barriers

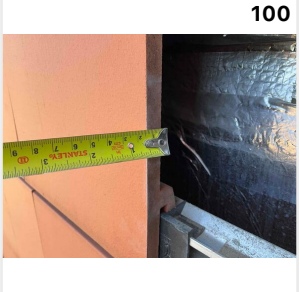
| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Horizontal Cavity Barrier | Stonewool core, aluminium foil faces | 107 |

Cavity closed at compartmentation wall

# Floor Slab

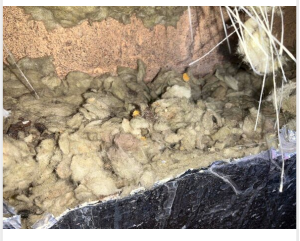
Backing Wall Sits On The Floor Slab

# Build-up Photos









# Cavity Barrier Photos

107

# Inspection: B8QK8L

Elevation • Location
Wall Inspection • Aperture Opening

## Name/Summary

Masonry (Brickwork)

## Proposed Inspection

The purpose of the intrusive survey will consist of the visual and intrusive inspections of the identified systems and attachments to determine the through wall construction.

The Engineer will be looking to determine the:
a) External Leaf (Identify the material and Euroclass)
b) Cavities (if a cavity is present and if so the depth and extent)
c) Insulation (identify the material and Euroclass)
d) Sheathing Board (the presence of any Sheathing Board)
e) Membranes (identify their presence and where possible manufacturer)
f) Substrates (the means in which the façade is attached to the building)
g) Cavity Barriers (Horizontally, Vertically, Around Openings)

The external inspection is undertaken by either using an approximate 25mm – 150mm bore in a discreet location or the removal of the external surface material. The engineer will then gather the external walls construction from external to internal.

The materials are then measured and observed in there construction along with photographic evidence.
Upon completion the removed material is placed back into the opening and sealed to a fire safe condition but will not conduct any decorative repairs.

## Build-Up

| 3 Elements | Thickness/Depth | Material | Photo Ref. | Rating (BS EN13501) |
|---|---|---|---|---|
| External Surface Material | 102mm | Brickwork | 108 | A1 - Non-Combustible |
| Insulation | 210mm | Mineral Wool Insulation | 109, 110 | A1 - Non-Combustible |
| Substrate | | Original brickwork | 110 | A1 - Non-Combustible |

# Cavity Barriers

| 1 Cavity Barrier | Material | Photo Ref. |
|---|---|---|
| Window Aperture | Solid State Mineral Wool | 109 |

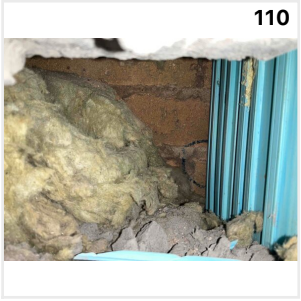
Cavity closed at the window opening

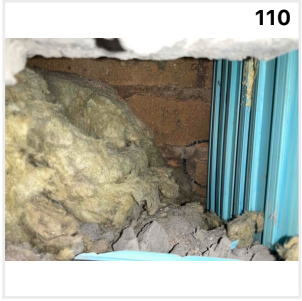
# Floor Slab

Backing Wall Sits On The Floor Slab

# Build-up Photos






# Cavity Barrier Photos

# External Windows

| Photo | External Window |
| --- | --- |
|   | Top, Mid, Side Hung Casements (6MJ9Q4) |

# External Window: Top, Mid, Side Hung Casements

External Window Reference
6MJ9Q4

## Details

### Surface Material

Aluminium

### Frame Material

Aluminium

### Infill / Panel Material

Glazing

### Details

Confirmation via magnet

## Fire Engineer Comments

Aluminium is a non-combustible material and does not contribute to the spread of fire. However, its relatively low melting point (approximately 660°C) and high thermal conductivity mean that it may deform or fail when exposed to high levels of heat.

The window infill has been assumed as laminated glass, which consists of layers of glass bonded with a polymer interlayer, typically PVB or EVA. While these interlayers are combustible, they are generally slow to ignite. Under prolonged exposure to elevated temperatures or direct flame, the interlayers may degrade, and the glass may crack or shatter due to thermal stress.

The windows are vertically aligned with less than 2 metres of separation between openings, which could create a potential pathway for vertical fire spread.

However, the aluminium window frames may be likely to maintain integrity beyond flashover temperatures. This offers a temporary barrier to flame ingress within the cavity, potentially delaying fire spread and supporting occupant evacuation and external firefighting intervention

# Photos


111


112


113

# External Doors

| Photo | External Door |
| --- | --- |
|  114 | Single Leaf Entrance Doors (KBR2LB) |

# External Door: Single Leaf Entrance Doors

External Door Reference
KBR2LB

## Details

### Surface Material

Aluminium

### Frame Material

Aluminium

### Infill / Panel Material

Glazing

### Details

Front/back entrance doors

## Fire Engineer Comments

Aluminium is a non-combustible material and does not contribute to the spread of fire. However, its relatively low melting point (approximately 660°C) and high thermal conductivity mean that it may deform or fail when exposed to high levels of heat.

The door infill has been assumed as laminated glass, which consists of layers of glass bonded with a polymer interlayer, typically PVB or EVA. While these interlayers are combustible, they are generally slow to ignite. Under prolonged exposure to elevated temperatures or direct flame, the interlayers may degrade, and the glass may crack or shatter due to thermal stress.

However, the aluminium door frames may be likely to maintain integrity beyond flashover temperatures. This offers a temporary barrier to flame ingress within the cavity, potentially delaying fire spread and supporting occupant evacuation and external firefighting intervention.

## Photos



# Plan: Wall Inspection

# Plan: Wall Inspection

# Plan: Wall Inspection

# Photos


1
FIRE NOTICE
In case of fire dial:
999 or 112
IF A FIRE OCCURS IN A NEARBY FLAT STAY INDOORS.
DO NOT OBSTRUCT THE STAIRS.
YOU WILL BE TOLD BY THE POLICE OR FIRE SERVICE IF YOU ARE REQUIRED TO LEAVE.
IF A FIRE OCCURS IN YOUR FLAT CLOSE ALL DOORS AND WINDOWS AND EVACUATE OCCUPANTS AT ONCE USING THE STAIRS.
Do not use lifts
Use stairs

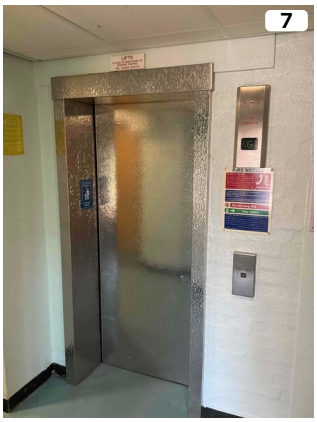

2
BUILDING SAFETY INFORMATION
Sandwell
ASTBURY COURT
FIRE SAFETY INFORMATION


3
Astbury Court


4
DRY RISER


5
DRY RISER


6


7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11

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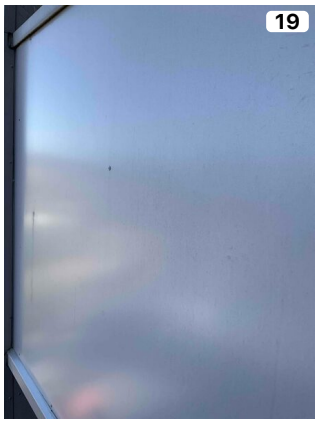



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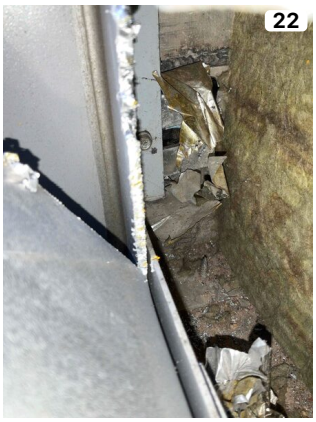





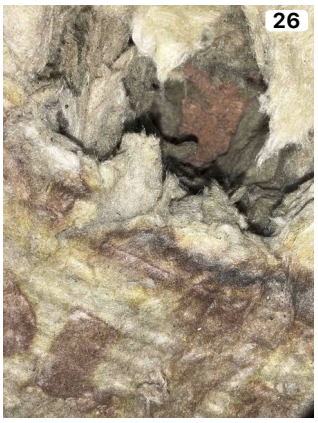


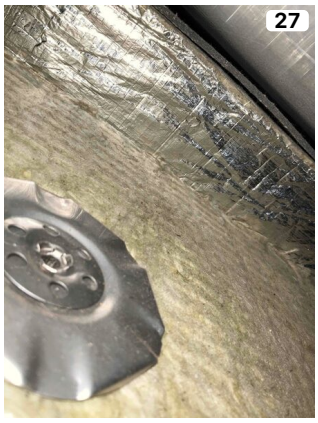








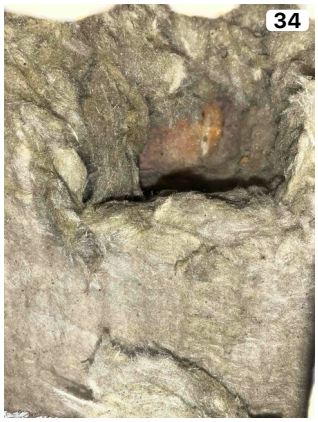

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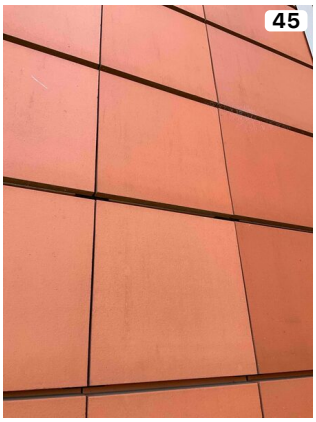




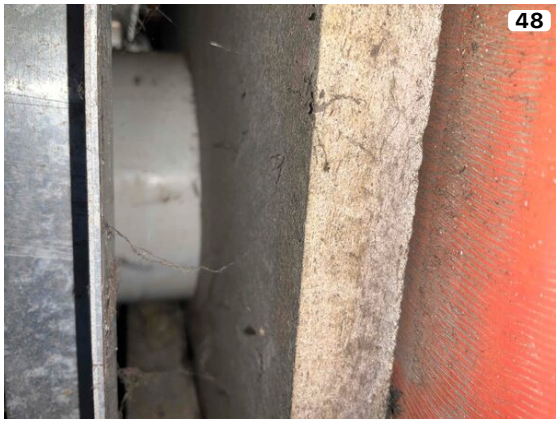





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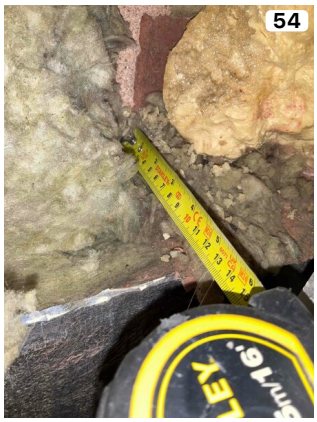











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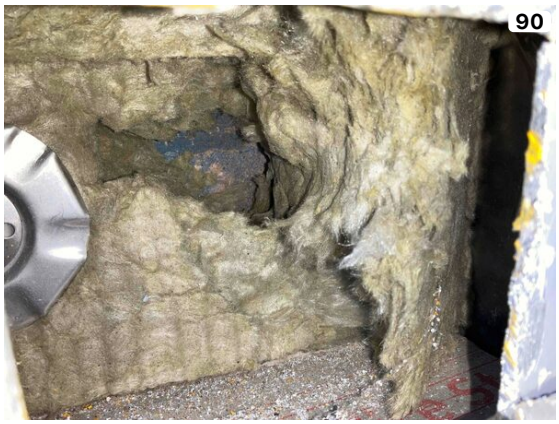


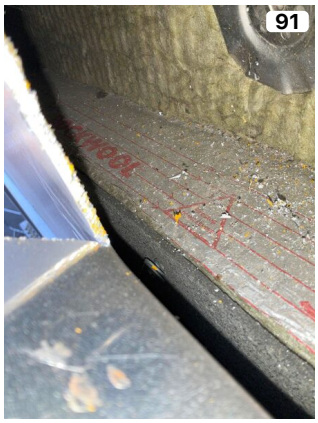



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BUILDING COMPLIANCE

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