

PART B

Boatmans, 42 City Road East,
Manchester.

External Wall Review

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1 Introduction

This report has been produced by PartB Group Ltd to assess the external wall systems of Boatmans, 42 City Road East, Manchester M15 4QF ("the premises") and review the Ark Sustainability Ltd, Facade Survey Assessment Report (Incl. EWS1 Determination), issued 18-02-2021 ("the Ark Façade Survey").

Building:

The EWS1 form requires compliance with Building Regulations 2010 and compliance with the Regulatory Reform (Fire Safety) Order 2005 as the form is focussed on matters of life safety only. Accordingly, this review performs as an assessment of the life safety risk.

PartB Group has performed the assessment on instruction from Boatmans Management Company Ltd ("the client").

1.1 Sources of Information

This report has been developed based on the following documents provided by the client as outlined in the table below

Description	Document/Plans No.	Revision	Produced by	Date
Facade Survey Assessment Report (Incl. EWS1 Determination)	J000008 / ASLPR200321	3.1	Ark Sustainability Ltd	18/02/2021
Manchester City Council Planning Permission Case File Including original plans	063349/FO/City3/01	-		2001
Type 3 Fire Risk Assessment	144867	6	Ark Workplace Risk Ltd	15/02/2021
Form EWS1: External Wall Fire Review	-	-	Ark Sustainability Ltd	17/11/2020
Thermal Imaging Report	-	-	IRed	12/05/2021
Analysis Of Cladding & Insulation Samples	68451/C	-	Sandberg LLP	04/11/2020
Analysis Of Cladding & Insulation Samples	68451/C/1	-	Sandberg LLP	04/11/2020

2 Assessment

The premises are subject to the requirements of both the Building Act 1984 and the Building Regulations 2010. The building began construction before 2010, but any alterations must comply with the requirements set out in the regulations and accompanying guidance.

In December 2018 alterations were made to Regulation 7¹ of the building regulations which resulted in all relevant domestic buildings over 18 metres (see section 5) requiring non-combustible materials to be used in the external wall construction. The premises would be regarded as a relevant building although original design and construction took place before the amendments.

Schedule 1 'Requirements' of the Building Regulations provides detail at Regulations B3 and B4 to the functional requirements required to satisfy the building regulations concerning fire safety.

Regulation B3 requires adequate measures are taken to resist fire spread throughout the building (internally) and that the building structure will adequately resist premature collapse in the event of fire.

Regulation B4 requires the external walls of the building to adequately resist the spread of fire over the walls and from one building to another. This will apply to the materials used in the wall build-up and to the external surface of the façade system.

The definition of the external wall is relatively extensive. It includes the following:

- anything located within any space forming part of the wall
- any decoration or other finish applied to any external (but not internal) surface-forming part of the wall
- any windows and doors in the wall; and
- any part of a roof pitched at an angle of more than 70 degrees to the horizontal, if that part adjoins a space within the building to which persons have access, but not access only for the purpose of carrying out repairs or maintenance.

Requirement B4 extends to ensuring that a reasonable level of health and safety is provided, by virtue of Regulation 8 of the building regulations.

The Approved Documents are intended to provide guidance for more of the common building situations. The relevant Approved Document to satisfy the fire safety requirements is Approved Document B ("ADB"). ADB has been provided as new and amended versions since 1985, the current edition for the remedial works at The Point is Approved Document B Volume 1: Dwellings 2019 (incorporating 2020 amendments) ("ADB 2019").

Since the fire at Grenfell Tower and the concerns with aluminium composite cladding (ACM), the government has issued a series of guidance notes that advise on the potential dangers of a fire

¹ The Building (Amendment) Regulations 2018

involving external walls in residential buildings. The notes make recommendations concerning the process for evaluating the risk, suitability of materials and wall build-ups and other issues, such as the external wall fixtures that may affect fire spread. The various guidance notes have been brought together in a consolidated guidance note issued in January 2020.²

This guidance note states:

'Existing residential buildings which have external wall systems that contain combustible materials may not meet an appropriate standard of safety and could pose a significant risk to the health and safety of residents, other building users, people in the proximity of the building or firefighters. External walls of residential buildings should not assist the spread of fire, irrespective of height. It is important therefore to understand both the materials used in the external wall construction and whether the entire system has been designed, installed, and maintained appropriately.'

Where residential buildings are over 18 metres in height, the guidance recommends materials used in the external construction of the building should be assessed in relation to their ability to resist the spread of fire. Where insulation materials are not made of non-combustible materials, i.e. materials classified as European Class A1 or A2-s1, d0 in accordance with BS EN 13501-1:2007+A1:2009: "Fire classification of construction products and building elements" there is the potential they will need to be replaced within non-combustible alternatives or assessed by a suitably competent engineer.

Where cladding materials cannot achieve European Class B-s3, d2 or better, an external wall build-up can be regarded as acceptable if the external wall system uses a system in line with one that has achieved a BR135 classification via a BS8414³ test. This assumes the system was installed correctly, including cavity barriers and fire stopping, and has been maintained appropriately. Should none of this be the case, the responsible person should seek urgent professional advice on the measures that need to be taken to ensure the external walls meet an appropriate fire safety standard.

This could involve the replacement of some or all the materials in the external wall. Consideration should be given as to whether short-term interim safety measures are required.

Additionally, the Regulatory Reform (Fire Safety) Order 2005 ("FSO") applies to all common areas which would require that general fire precautions are taken that may be reasonably required to ensure the premises are safe.

² Advice for Building Owners of Multi-storey, Multi-occupied Residential Buildings. MHCLG, January 2020

³ BS 8414-1:2020 Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to, and supported by, a masonry substrate and BS 8414-2:2020 Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to, and supported by, a structural steel frame.

At the time of drafting, the proposed 'Fire Safety Act 2020' is expected to clarify the application of the FSO to include the external walls of buildings.

As such, an assessment of the external wall construction will be needed as part of the fire risk assessment required under the FSO. Similar requirements under the FSO exist, requiring the safety of relevant persons is safeguarded in the event of a fire. This is presently recommended by the MHCLG consolidated guidance note.

2.1 Limitations

The advice herein is provided for the intention of life safety only. These will typically have a property protection benefit to some extent, but the report findings should also be discussed with the developer's insurers to confirm they will not impose any additional requirements.

It should be noted this report applies only to this development and is based on the information currently available. The conclusions of the report should not be applied to any other project and maybe invalidated if aspects of the building design are altered.

This report is intended to highlight deficiencies within the external wall system and provide potential solutions. In no way should this report be considered a design brief or a report to provide a 'fire engineered' solution. Should any of the measures suggested within this report be considered appropriate, a full design appraisal should be undertaken.

The conclusions within this report are drawn on limited sampling. It is strongly advised the client ratifies these findings with additional investigations prior to commissioning extensive works.

3 Existing Fire Safety Features

3.1 Building Description

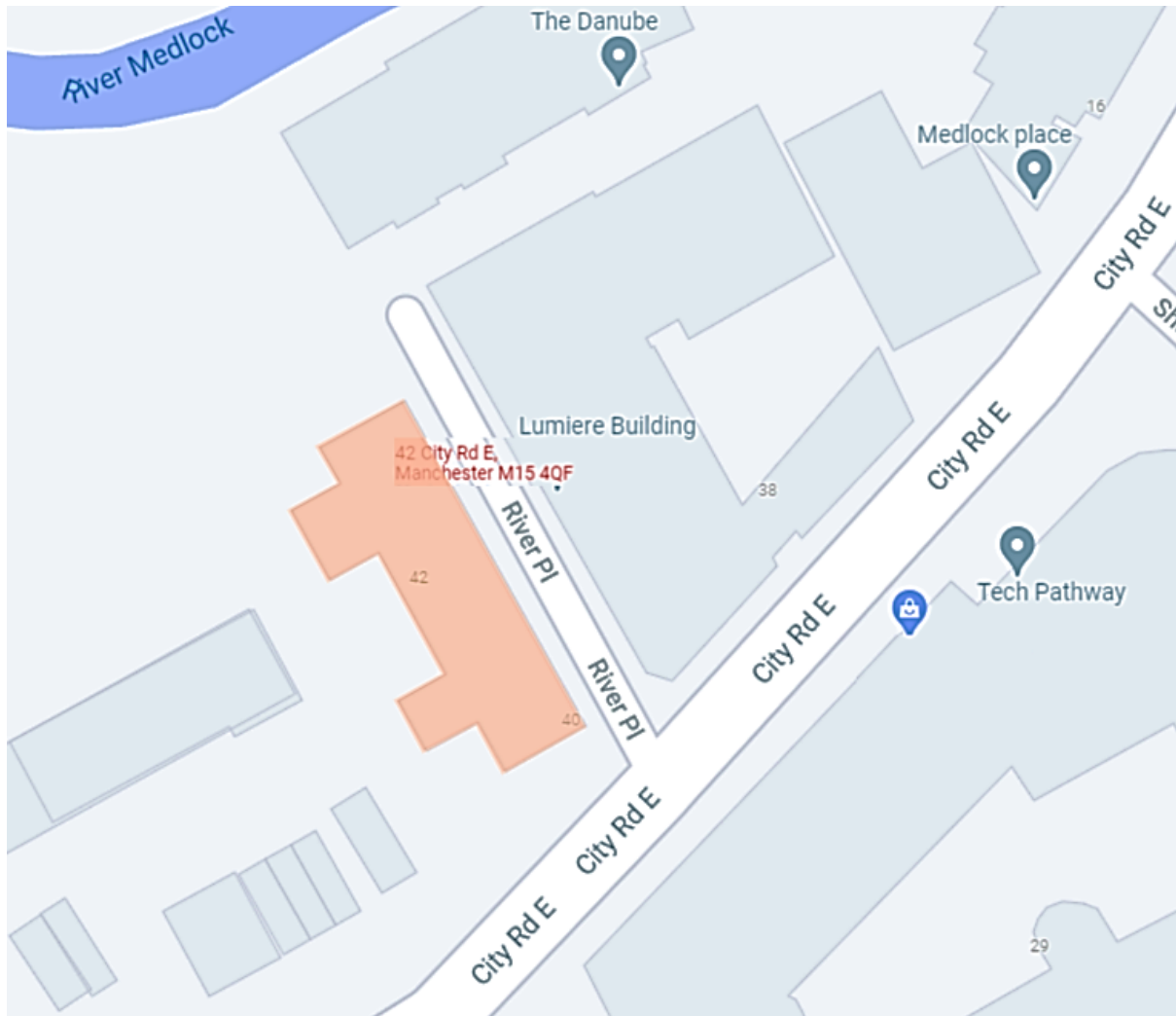


Figure 1 - Location of Boatmans (source Google Maps)

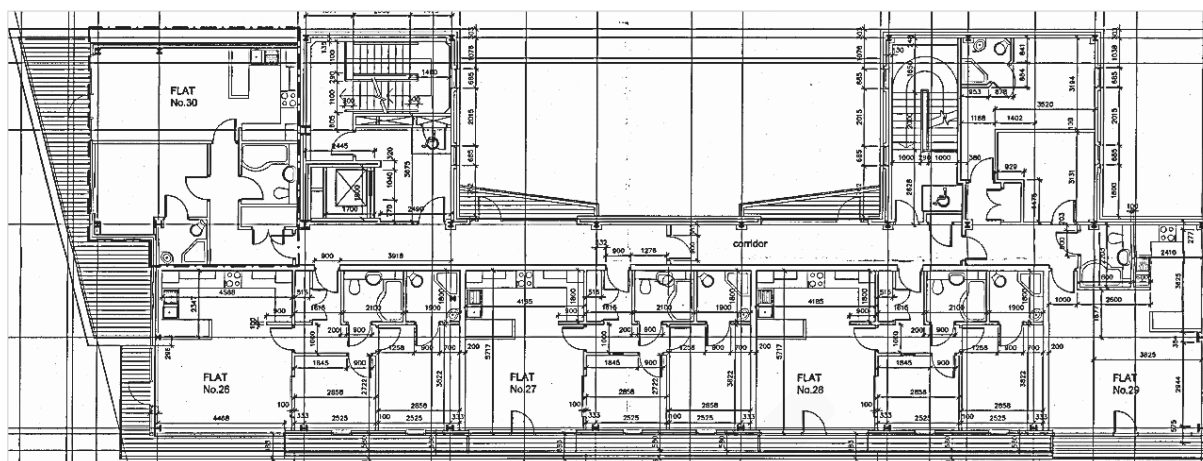


Figure 2 - Typical Floor Layout

The premises is designed to support a 'stay put' evacuation strategy which means that, in the case of a fire in an apartment, only the occupants of that apartment are expected to leave the building. The evacuation process in these premises is on an apartment-by-apartment basis (i.e. not all occupants simultaneously). As a result, escape routes need to be available for an extended period, typically coincident with firefighting operations. Therefore, substantial compartmentation within the building is provided to protect the occupants. This includes the ability of the external walls to restrict the spread of fire.

The premises is a mixed-use development located near Manchester City Centre, situated on the corner of River Place and City Road East. It consists of seven storeys, with car parking, pedestrian residential entrance, service areas and a commercial unit to the ground floor with 29 residential apartments spread over first to sixth floor levels. The finished floor level of the uppermost storey is understood to be 20 metres above ground level.

The premises is provided with two stair cores and a single lift core which has been confirmed to be a firefighting lift (Fire Risk Assessment - 144867, Ark Workplace Risk Ltd. 15.02.2021) serving all floor levels.

The construction of the building should contain the fire for a period of time to enable the fire and rescue service to control the incident and extinguish the fire. Any people who feel at risk in the remainder of the building are expected to evacuate using the protected staircase.

Fire service intervention is facilitated using the fire protected stairs and corridors, smoke control facilities, the fire fighting lift, and dry rising main.

As built design drawings and construction specifications were not available for reference at the time of authoring this report, it is not possible to fully clarify the design. A sample set of intrusive investigations into the external wall were carried out.

4 External Wall Build-Up

There are combustible elements of the wall construction which are identified and discussed in the following sections.

4.1 External Wall Construction

4.1.1 Wall build-up and materials found during the Ark Façade Survey

There are three identified wall build-ups on the premises, which are discussed in this section. The Ark Façade Survey details three different wall types, which were detailed in the report as:

- Cladding / Wall Type 1 – Facing Brickwork
 - Facing Brickwork (100mm),
 - Insulation (Soda-lime-silicate glass wool) (150mm)
 - Blockwork (Assumed) (Unknown Thickness)
- Cladding / Wall Type 2 – Timber Cladding
 - Horizontal Timber Cladding (19mm and 34mm)
 - Membrane (Assumed Breathable Membrane) (< 1mm), Clear Cavity (25mm)
 - Blockwork (100mm)
 - Insulation (Sodalime-silicate glass wool) (150mm)
 - Blockwork (Assumed) (Unknown Thickness)
- Cladding / Wall Type 3 – Clay Blockwork
 - Clay Blockwork (Unknown Thickness)
 - Internal Structure (Unknown Composition /Thickness)
- Balconies - are attached to the walls of the premises which were found to be a metal (steel assumed) structure with metal handrail and posts and mesh metal grille balustrade. Timber has been used to provide the decking.

Testing was carried out by Sandberg Consulting Engineers, Sandberg LLP, on the horizontal timber cladding and the insulation (Soda-lime-silicate glass wool). This testing found:

- The timber section readily supports combustion and continued to burn after the source of ignition was removed once alight. The burning behaviour did not suggest the presence of an effective fire retardant. The sample was combustible and flammable.
- The insulation wool sample contracted and melted at the edges exposed to the flame but did not support combustion nor was flammable. The sample was not combustible nor flammable.

It is noted that a number of assumptions are made for each wall type build-up and attachments within the Ark Façade Survey. Further works have been carried out by Quality Fast Facades Ltd.

4.1.2 Wall build-up and materials found by Quality Fast Facades Ltd

Limited access was available for these intrusive investigations.

Works carried out on 17th September 2021 were reported via email from Andrew Marsden sent on Mon 20/09/2021 19:35. It was noted the external walls to the building are predominantly masonry cavity wall. The build-up is as follows (inside to out):

- 1no layer (12.5mm) plasterboard
- Dot and dab adhesive
- 140mm aerated concrete block
- 100mm cavity fully filled with glasswool quilt insulation
- 102.5mm facing brick

Confirming a two-leaf masonry wall structure for Wall Type 1 (see Figure 3 below).

It was also noted during this survey that; balconies *had been under drawn with what appeared to be the same board lining a soffit between first and ground floor levels. A section of the board was removed to the soffits between ground and first floor levels, no markings could be seen on the rear of the product.*



Figure 3 - showing two leaf masonry wall build-up

Works carried out on 3rd October 2021 were reported via email from Andrew Marsden sent on Mon 04/10/2021 15:42.

Access to a balcony was provided, the timber cladding, decking and soffits were investigated in this area.

It was noted during this survey that *'the timber cladding runs up behind the soffit boards... and behind the decking'* (see Figure 4 below). The soffit boards could not be identified. To replace the timber cladding and undertake any remedial works behind would require the removal of the decking and soffit boards which should not be reinstalled to the building as it is not confirmed if either are A1 or A2 fire rated.



Figure 4 - cladding and soffits around balcony

Works carried out on 5th November 2021 were reported via email from Andrew Marsden sent on Tue 09/11/2021 07:48.

Further assumptions made in the Ark Façade Survey were investigated. However, access was only limited managed to a limited number of flats.

- It was confirmed the clay tiles are bonded directly to dense concrete blockwork and the clay tiles are only used around the car park ground floor level.
- The concrete blockwork on the uppermost storey wall is taken up to the underside of the roof.
- Cavities are closed at the head of the wall via coping stone where the external wall becomes a parapet wall (see Figure 5 below).
- All the timber cladding inspected to the top floor apartments (no's 28 & 26) was fitted to the blockwork via timber studs but with no combustible insulation (or insulation at all) to the void between the cladding and concrete blockwork.
- The soffit board material appeared to be HPL 6mm thick (this has not been confirmed).
- Regarding flats with balconies along River Place (Apartment no's 10 & 14), these apartments only have timber cladding above the balcony doors (accessible from the balcony). The wall construction (see Figure 5 below) is as follows:
 - 2x12.5mm plasterboard
 - VCL (appeared to be a DPM type material)
 - 50mm mineral wool
 - 50mm Void
 - 11mm plywood
 - 18mm cedar timber cladding

This wall build-up was not considered by the Ark Façade Survey. This will now be Cladding / Wall Type 4 - timber cladding to balconies.

- There was no fire barrier around or duct passing through the wall from the air vent
- Access was not available to balconies with soffit boards. However, from a colour perspective, the soffit boards to balconies are the same colour as the material we removed above the car park.

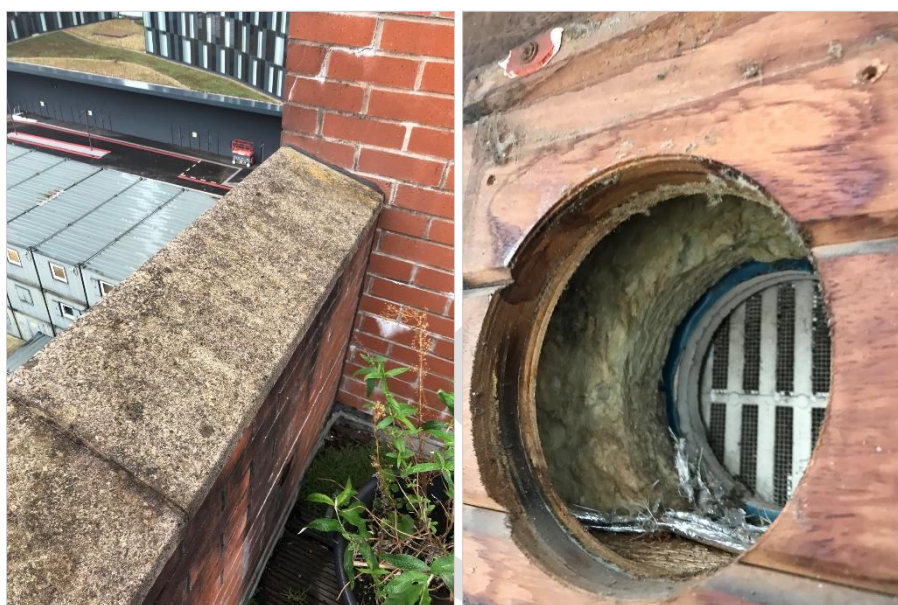


Figure 5 - External wall capped as parapet and Wall Type 4

It has not been confirmed what type of material the soffit board is constructed from so subsequently it is not known if this is a combustible material.

5 Remedial work and guidance

5.1 BS 8579:2020 - Balcony Design Standard & Decking Solutions

The BS 8579:2020 offers guidance on the design of balconies and terraces. The document indicates that on a building with an occupied floor above 11 metres, where balconies are stacked (directly above one another) the materials used in the construction of the balcony should have a European reaction to fire classification of A1 or A2-s1, d0 in accordance with BS EN 13501-1:2018⁴. The fire classification of A1 or A2-s1, d0 also applies to components of balconies (including the supporting structure in a free-standing balcony) on all buildings with an occupied floor over 11 metres above the lowest ground level. This does not apply to the following:

- (a) cavity trays when used between two leaves of masonry

⁴ BS EN 13501-1:2007+A1:2009: "Fire classification of construction products and building elements"

- (b) any part of a roof (other than any part of a roof which falls within paragraph (iv) of regulation 2(6)) if that part is connected to an external wall
- (c) door frames and doors
- (d) electrical installations
- (e) insulation and water proofing materials used below ground level
- (f) intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1
- (g) membranes
- (h) seals, gaskets, fixings, sealants and backer rods
- (i) thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1 or
- (j) window frames and glass

5.2 Approved Document B

As set out at the Section 2 above, Requirements B3 and B4 of the Approved Document B are relevant in relation to the external wall systems of a building with regards to fire spread. Provisions of ADB 2019 which are relevant to the remedial works for the external wall system at the premises are listed below.

Requirement B3: Provision of Cavity Barriers:

Section 8 'Cavities – flats' of ADB 2019 sets out the following:

Paragraph 8.3 confirms where cavity barriers ought to be located within a wall construction i.e.

- a) At the edges of cavities, including around openings (such as windows, doors and exit/entry points for services).
- b) At the junction between an external cavity wall and every compartment floor and compartment wall.
- c) At the junction between an internal cavity wall and every compartment floor, compartment wall or other door assembly forming a fire resisting barrier.

Paragraph 8.8 confirms cavity barriers (tested from each side separately) should provide a minimum of both 30 minutes' integrity and 15 minutes' insulation.

In relation to how cavity barriers ought to be fixed, Paragraph 5.22 of ADB 2019 states cavity barriers should be tightly fitted to a rigid construction and mechanically fixed in position.

In relation to fire-stopping, Paragraph 9.25 of ADB 2019 confirms materials used for fire-stopping should be reinforced with (or supported by) materials rated Class A2-s3, d2 or better.

Paragraph 9.26 of ADB 2019 notes proprietary tested fire-stopping and sealing systems available which may be used.

Requirement B4: External fire spread:

Paragraph 10.5 of ADB 2019 sets out the external surfaces of external walls should comply with the provisions in Table 10.1. An extract of Table 10.1 is provided below.

Table 10.1 Reaction to fire performance of external surface of walls			
Building type	Building height	Less than 1000mm from the relevant boundary	1000mm or more from the relevant boundary
'Relevant buildings' as defined in regulation 7(4) (see paragraph 10.10)		Class A2-s1, d0 ⁽¹⁾ or better	Class A2-s1, d0 ⁽¹⁾ or better
Assembly and recreation	More than 18m	Class B-s3, d2 ⁽²⁾ or better	From ground level to 18m: class C-s3, d2 ⁽²⁾ or better

Figure 6: Extract from table 10.1 of ADB 2019

A 'relevant building' is defined within Regulation 7(4) of The Building (Amendment) Regulations 2018 and confirms the following:

'A "relevant building" means a building with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level and which—

- (i) contains one or more dwellings;
- (ii) contains an institution; or
- 1. (iii) contains a room for residential purposes (excluding any room in a hostel, hotel or boarding house).'

At 20 metres above ground level, the premises is a relevant building.

In addition, Paragraph 10.6 confirms in a building with a storey of 18 metres or more in height that any insulation product filler material used in the construction of an external wall should be Class A2-s3, d2 or better. Paragraph 10.10 confirms any 'relevant building' requires all materials which become part of an external wall achieve Class A2-s1, d0 or Class A.

Cavity Barriers in Wall Type 1 - exception to cavity barrier requirements

The Arc Façade Survey does not investigate the masonry wall to its full thickness. However further investigation by Quality Fast Facades Ltd has shown that the Wall Type 1 meets with Diagram 5.3.

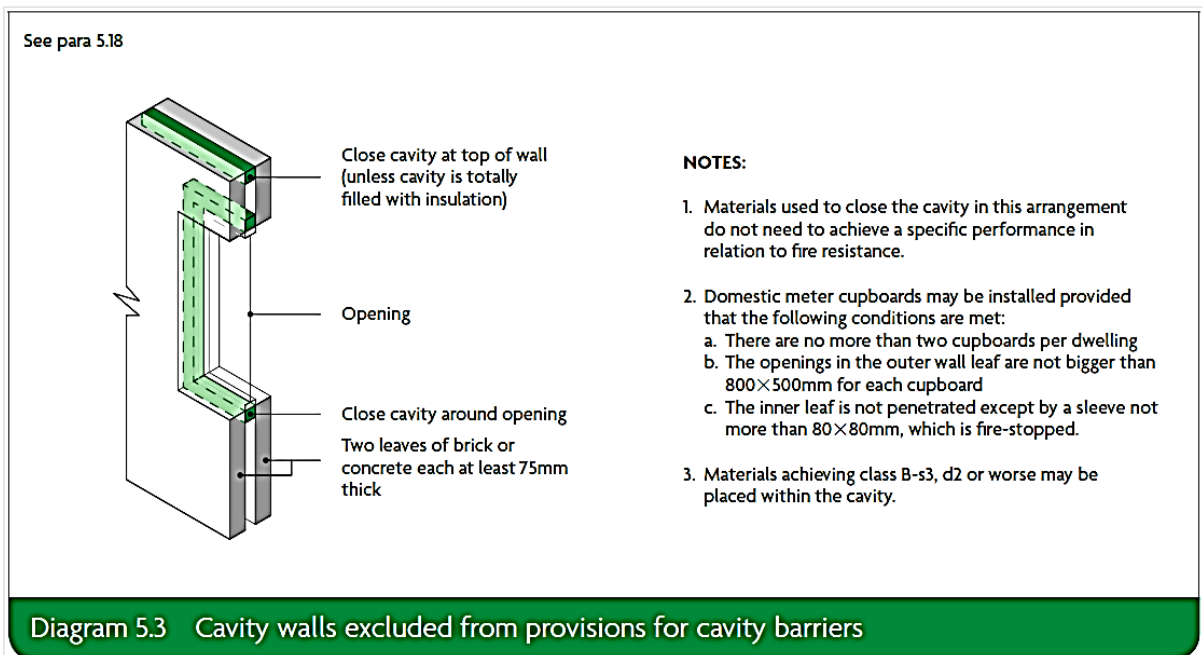


Figure 7: Diagram 5.3 of ADB 2019

With two leaves of brick or concrete each at least 75mm thick, Wall type 1 only requires cavity barriers around openings. The cavity is currently not fully filled with insulation so must also be completely closed at the top of the wall.

6 Conclusion and Recommendations

PartB has conducted a review of the details provided and has concluded that the previously issued EWS1 option B2 is applicable.

Wall Type 1 - This wall type meets the guidance of ADB 2019.

Wall Type 2 - The overall area covered by this wall type is low with the timber cladding fixed directly to the outer block work. It is understood the Building Safety Fund (BSF) have confirmed remediation is required for the timber cladding, following previous advice (email forwarded by Chris Frankish Mon 18/10/2021 13:46). This wall type does not meet the guidance of ADB 2019.

Wall Type 3 - The substrate behind the clay tiles has been investigated in as part of the additional works carried out by Quality Fast Facades Ltd. It was found the clay tiles are bonded directly to dense concrete blockwork. This wall type meets the guidance of ADB 2019.

Wall Type 4 - The requested information for timber around the balconies found timber cladding above the balcony doors (accessible from the balcony). It is recommended the extent of this wall type is further investigated. It is understood the Building Safety Fund (BSF) has confirmed remediation is required for the timber cladding, following previous advice (email forwarded by Chris Frankish Mon 18/10/2021 13:46). This wall type does not meet the guidance of ADB 2019.

Balconies - The balconies are stacked (directly above one another) and reach a height of above 11 metres. The decking to all balconies is timber. All balconies should have the combustible timber removed and replaced with materials with a European reaction to fire classification of A1 or A2-s1, d0 in accordance with BS EN 13501-1:2018, in line with government guidance and appropriate British Standard BS 8579:2020.

Soffit Board - This board has been checked and no product identification was found. This material may be combustible and therefore may not meet with the guidance of ADB 2019. This material could be tested to confirm its combustibility or should be replaced with a product that is known to meet the guidance of ADB 2019.

Accordingly, we recommend the following approach for consideration.

- Remove timber cladding and, where necessary, replace with a material which meets European reaction to fire classification of A1 or A2-s1, d0 in accordance with BS EN 13501-1:2018.
- Remove timber decking on the balconies and replace with a material which meets European reaction to fire classification of A1 or A2-s1, d0 in accordance with BS EN 13501-1:2018.
- Remove the soffit board and replace with a material which meets European reaction to fire classification of A1 or A2-s1, d0 in accordance with BS EN 13501-1:2018. The soffit board could be tested to confirm its performance against the criteria in EN 13501-1 which must be met to confirm its combustibility and the need for its removal.