INTERNATIONAL FIRE CONSULTANTS LIMITED

PRIVATE & CONFIDENTIAL

20:20 House (Residential management) Limited C/o Cardoe Martin – 20:20 Building, Skinner Lane, Leeds

Fire Safety Review of External Walls and Attachments

IFC Report FSA/21183/01

Prepared on behalf of:

20:20 House (Residential management)
Limited C/o Cardoe Martin
Aizlewood Business Centre
Aizlewood's Mill
Nursery Street
Sheffield
S3 8GG

23th November 2021

International Fire Consultants Ltd
Head & Registered Office: Park Street Business Centre, Princes Risborough, Buckinghamshire, England HP27 9AH
Tel: +44(0)1844 275500, Fax: +44(0)1844 274002, E-mail: info@ifcgroup.com
Registered No: 2194010 England
An International Fire Consultants Group Company

ISSUE RECORD

Rev	Date	Author	Review	Section	Amendments
Issue	23/11/2021	HH	VR	-	-

CONTENTS

1. INTRODUCTION

International Fire Consultants Ltd (IFC) have been commissioned by 20:20 House (Residential Management) Limited to carry out a fire risk review of the external wall and attachments for 20:20 House. The attachments primarily consist of balconies.

In carrying out this review IFC have carried out the following:

a) A review of documentation that was prepared at the time of construction, including drawings and specifications as listed in Appendix A.

b) Photographic evidence of the construction of the external wall and attachments as provided by the contractors Ballymore.

c) Site inspections which were carried out by IFC on 11/02/2021, 16/06/2021, 01/09/21, 29/09/21 and 26/10/2021.

This report summarises the results of the review and IFC's conclusions relating to the level of fire risk presented by the external walls and attachments.

It should be noted that this report describes the fire risk to occupants due to the risk of fire spread across the outer surfaces of the external walls and attachments and through any cavities within the external walls. It does not address any other fire risks within the building, or any other issues (e.g. property protection). However, this report could be used to support the overall fire risk assessment for the building which would be required under the Regulatory Reform (Fire Safety) Order 2005.

This review has been carried out following the general principles as described in the MHCLG Consolidated Advice Note[1] that was issued in January 2020 and consolidates the advice of various other previous advice notes that MHCLG had previously published.

This report is a risk review, not a compliance review. As such, it assesses the fire risk presented by the existing building. It does not measure or confirm compliance with Building Regulations and guidance that may have been relevant at the time of construction.

[1] MHCLG Advice Note: Advice for Building Owners of Multi-storey, Multi-occupied Residential Buildings, issued January 2020

2. RISK REVIEW PROCESS

At the time of issue of this report there is no universally accepted method for carrying out a fire risk review of external walls and attachments of existing buildings. The British Standards Institution (BSI) are in the process of preparing a document which is intended to cover this (PAS 9980). At the time of issue of this report that document has been published as a draft for public comment and whilst it includes various useful reference information, it was clear that it should not be relied on in its current state.

This report has therefore taken note of the useful guidance in PAS 9980 but the overall review of the fire risk has followed conventional risk assessment processes where the overall risk is a combination of the likelihood of a fire occurring and spreading, and the consequence should that occur. This provides an assessment of the level of risk, which will determine whether further works are required to reduce the risk to a tolerable level. This is summarised in Appendix B.

In order to assess the risk, there are three main issues to assess:

1) The probability of a fire occurring that impacts the external wall or attachments.
2) The likelihood of whether it would spread significantly across or within the external wall or attachments.
3) Whether the fire would be likely to present a life safety risk to the building occupants.

IFC have carried out a review of the main factors which would affect each of these items and have described the results of that review below.

It should be noted that it is never possible to entirely eliminate all fire risk and so, as with any risk assessment process, the intention is to reduce the fire risk to a tolerable level or lower.

2.1 Acceptability criteria

As noted earlier, this risk review only addresses the risk of fire spread either over the surfaces of external walls and attachments, or fire spread through any cavities within the external walls.

In order to assess the probability of this occurring, a review has therefore been carried out of the combustibility of the various materials used within the external walls and attachments and also of the methods used to seal any cavities that may be present within the external wall.

Design guidance for new buildings has varied over the years and so the actual guidance that would have applied would depend on when the building was designed and built. However, this report is a review of the fire risk presented, not an assessment of whether it complied with specific design guidance that was current at a particular point in time.

This review has followed approaches which have been considered acceptable within the construction of external walls in the UK for several years (primarily as contained in the 2006 and 2013 versions of Approved Document B and also referenced in the MHCLG Consolidated Advice Note) although also taking account of lessons which have been learnt by the industry relating to the limitations of those approaches.

The main factors which have been considered in this review are:

a) Reaction to fire performance of the external surface of the wall.
b) Combustibility/reaction to fire performance of the main materials within the external wall and attachments.
c) Presence of cavity barriers in key locations within the external wall.

For buildings which are under 18m high (measured to the floor level of the highest occupied storey) there were no specific restrictions on item b) above, and so the main criteria would be items a) and c) - i.e. reaction to fire performance of the external surface, and the presence of cavity barriers.

For buildings which are over 18m high there were additional restrictions on the combustibility of the insulation (and other) materials within the wall. Typical options would be to either use materials which are classified as of limited combustibility or better, or to use a wall system which, when tested to BS 8414, passed the criteria of BR 135. The latter option would include the wall system itself, not just the individual components.

In addition, there have been recent concerns regarding the fire performance of materials such as ACM panels with combustible cores. It should be noted that remediation work was undertaken by Ballymore to replace the ACM panels and IFC understand this work is complete. The ACM was predominantly on the uppermost floor with ACM being in isolated areas provided around the pillars from ground to fifth floors. IFC understand all ACM was replaced on the building.

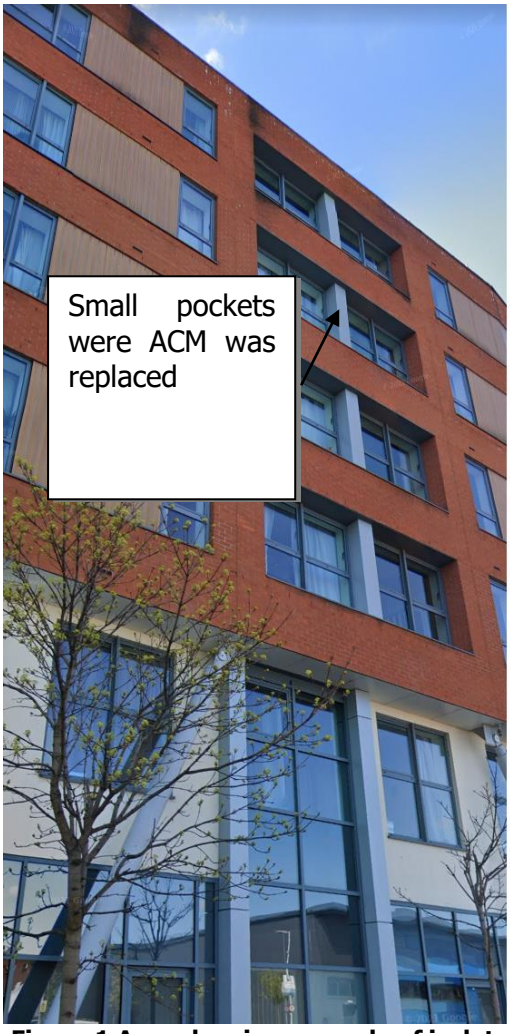

Figure 1 Area showing example of isolated pockets were the ACM was replaced by Ballymore

Buildings which have external wall systems comprising two layers of masonry, each at least 75mm thick, would be excluded from items b) and c) above – i.e. there would be no restrictions on the combustibility of any insulation located between the two masonry layers and there would be no need for cavity barriers in line with floor slabs or party walls. The edges of the cavity should be sealed, although there would be no specific fire performance needed for those edge seals.

2.2 BRE Report on Balcony Fire Safety

As noted earlier, there is no universally accepted approach for assessing the fire risk of external walls or attachments (e.g. balconies) on existing buildings.

The fire risk presented by balconies was reviewed in BRE report "Fire safety issues with balconies" dated July 2016 and referenced in the MHCLG Advice Note 21. The BRE report stated that the research did not identify any deaths that had occurred as a

result of balcony fires and that *"there are no specific statutory requirements in respect of external fire spread for the incorporation of balconies to a structure"*.

However, it also stated that consideration should be given *"of the potential fire risks associated with fires on balconies …. especially from the materials used…"*. This included materials such as timber, but also any insulation that may have been used in the balcony construction.

IFC are aware that research is being carried out on this topic but the results of that research have not yet been made public, so it is not possible for this assessment to take that into account.

IFC have based this review on the assumption that the fire risk is impacted by factors such as:

- The materials used in the construction of the balconies.
- The size, extent and physical arrangement of the balconies.
- The presence of combustible materials on the balconies.
- The usage of the balconies (e.g. whether fire risk activities such as barbeques occur on them).

As such, in the interim period before that research is publicly available, IFC have taken an approach which attempts to address the more severe fire risk situations that may occur on balconies, but without resorting to expensive remedial measures which may later turn out to be unnecessary. However, once that research is published, it may be necessary to review the balcony fire risk in light of the results of that research.

It is noted that there are balconies on this building, some of which connect floor to floor.

3. OVERVIEW OF BUILDING

20:20 House is a singular block residential building (purpose group 1a) constructed circa. 2008. It is 7 storeys in height (including ground floor) with the two raised blocks forming the sixth floor.

The building is predominantly masonry finish (floors 2-5), but the ground and first floor façade comprises aluminium curtain walling and a render coated system. The 6th floor façade comprises new rainscreen cladding, and across the building there is existing timber/trespa panels also in place, with the panels on the north elevation having more recently been replaced with Trespa panels.

The building has four stairs, with 1 stair serving each block on the sixth floor. A stay-put evacuation policy is in place for the occupants.

Building Address:

20:20 House
Skinner Lane
Leeds
LS7 1BE

Figure 2 – Existing North Elevation

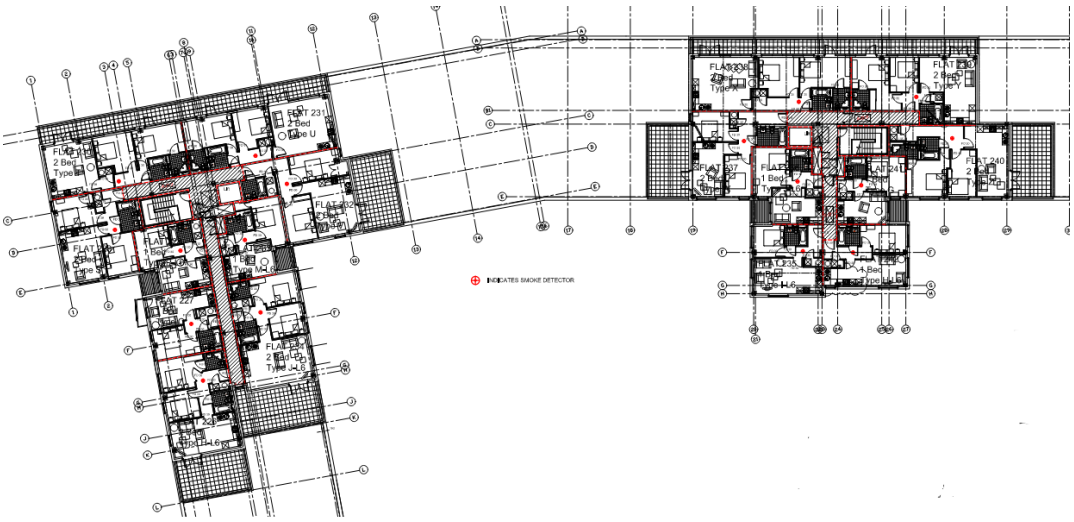

Figure 3 – 7th Floor Layout

4. EXTERNAL WALL CONSTRUCTION

4.1 Overview

The building has 6 different wall types. Each one has been investigated separately and summarised below.

4.2 Intrusive investigations

In order to confirm the actual construction of an external wall it is typically necessary to look into the wall itself which would normally require intrusive investigations. Those intrusive investigations would often be difficult, expensive and damaging to the external walls.

As a result, IFC would need to balance the need for carrying out sufficient investigations to assess the construction of the walls, whilst minimising the number and size of those intrusive investigations.

However, that does mean that any investigations which have been carried out will not guarantee that all areas of the external walls are to that standard. IFC can only confirm the wall construction in the areas in which the investigations occurred, and that gives no guarantee that other parts of the external wall construction are to the same standard.

As a result, this report should not be interpreted as a guarantee that the entire external wall construction is to the standard of the locations that have been investigated.

4.3 Wall type 1 – Brick Façade

4.3.1 Wall type 1 information summary

This wall type is provided on levels 2-5 but also on level 1 in some areas of the façade as shown in Figure 4 below. This wall type makes up the majority of the external wall.

Figure 4 - Image showing the North/East Elevations

The wall build-up included the following materials:

a) Concrete Block circa 100mm thick
b) Breathable Membrane
c) Mineral wool/earth wool insulation
d) Unidentified combustible insulation presumed to be PIR/PUR insulation
e) Redbrick circa 100mm thick

There are no drawings to show cavity barriers within the masonry external walls.

However, Ballymore and IFC inspected this wall type in a small number of areas and there appeared to be a polythene-sleeved mineral wool cavity barrier horizontally at floor level.

Figure 5 – Intrusion into Brick Façade

Figure 6 – Cavity within Brick Façade

4.3.2 Wall type 1 conclusions

- The external walls are kiln fired clay bricks and masonry blockwork inner leaf, which are inherently non-combustible.
- The insulation is a mixture of non-combustible and combustible insulation. The insulation is sandwiched between inherently non-combustible inner and outer leaf's.
- Cavity barriers appear to be in place in some locations. However following guidance in ADB, it is acknowledged that cavity barriers can be omitted with this type of wall, therefore IFC consider that even without cavity barriers, this is acceptable.
- Overall, the fire risk in this wall type is therefore considered to be **Trivial**.

4.4 Wall type 2 – Aluminium Curtain Walling System

This wall type is provided on the ground floor of the façade as shown in Figure 7 below.

Figure 7 – Example of the Aluminium Curtain Walling System

The wall build-up included the following materials:

a) Curtain walling with aluminium and glazing.
b) At the interfaces with the internal compartment walls there were small strips of ACM that were replaced with new 3mm thick aluminium panels. This is covered fully below in wall type 5 (section 4.7).

4.4.1 Wall type 2 conclusions

- The external wall is considered non-combustible.
- The interface with the internal compartment walls and external wall requires further investigation to confirm the internal walls abut the curtain wall.
- Overall, the fire risk in this wall type is therefore considered to be **Trivial**.

4.5 Wall type 3 – Render Coated System

This wall type is provided on the ground-first floor of the façade as shown in Figure 8 below.

Figure 8 – Example of the Render Coated System

The wall build-up (only one area was inspected) included the following materials:

a) Concrete block circa. 100mm thick
b) Render coating. The type of render used is unknown

4.5.1 Wall type 3 conclusions

- The render coated system to the external wall is considered non-combustible.
- Overall, the fire risk in this wall type is therefore considered to be **Trivial** if the remainder of this wall type is render on blockwork. We suggest a wider sample along this wall type is undertaken as part of due diligence.

4.6 Wall type 4 – Timber/Trespa Cladding

4.6.1 Wall type 4 information summary

This wall type is provided in small areas between windows on floors 1-5 of the façade as shown in Figure 9 below.

Figure 9 – Example of the Trespa Cladding on the North Elevation

On the North and East facing elevations the timber cladding has been replaced with Trespa panels.

The wall build-up as shown in the drawings and reports listed in Appendix A included the following materials:

a) Concrete Block inner leaf circa 100mm thick.
b) Timber Batten fixed to the block inner leaf.
c) Mineral Wool/earth wool Infill Insulation.
d) Breathable Membrane.
e) Timber Cladding Panels/Trespa Panels fixed into timber battens.

IFC were not provided with drawings to show cavity barriers within this external wall type on the 20:20 Building.

Figure 10 – Intrusion into Timber Cladded Façade

Figure 11 – Intrusion into Timber Cladded Façade

4.6.2 Wall type 4 conclusions

- The Trespa panel is a standard panel with reaction to fire properties of D-s2, d0 and timber panels to the external walls generally will have reaction to fire classification of D when tested to BSEN 13501. This façade is therefore considered combustible. This wall type presents the potential for fire spread over the external wall, particularly vertical fire spread as the panels are constructed in a line in the vertically orientation. IFC consider that this wall type did not meet the functional requirements of the Buildings Regulations when the building was constructed in circa 2008.
- The insulation is mineral wool/earthwool and non-combustible.
- At the interface where the wall type changes or at the internal compartment line, no cavity barriers are provided. IFC expect to see cavity barriers in these locations, specifically around all four sides creating a picture frame and were the internal compartment walls meet the external wall.
- Overall, the fire risk in this wall type is therefore considered to be **Moderate**.

4.7 Wall type 5 – Rainscreen Cladding around columns

4.7.1 Wall type 5 information summary

This wall type is provided to small sections of the façade as shown in Figure 12 below.

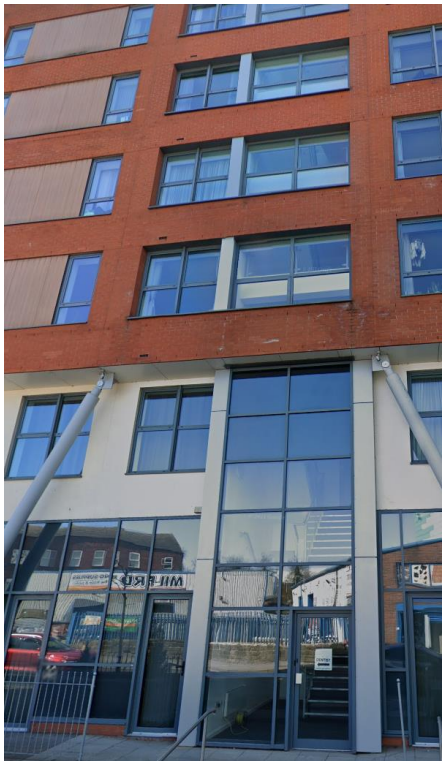

Figure 12 – Example of the Rainscreen Cladding Found in Small Sections Across the Building

The small sections of ACM cladding found at ground/1st and in a few strips up the building were replaced by Ballymore with 3mm thick aluminium rainscreen panels.

The wall build-up includes the following materials:

a) Aluminium Rainscreen Cladding Panels – 3mm thick
b) Mineral/earth wool insulation compressed between panel and steel
c) Structural steel (universal column) that sits behind the panels. The Aluminium Rainscreen Cladding essentially is there to hide the universal column.

4.7.2 Wall type 5 conclusions

- The external wall is non-combustible.
- The insulation is non-combustible.
- Overall, the fire risk in this wall type is therefore considered to be **Trivial**.

4.8 Wall type 6 – Rainscreen Cladding

4.8.1 Wall type 6 information summary (6th floor)

This wall type is provided on the upper level of the façade as shown in Figure 13 below.

Figure 13 - Example New Rainscreen Cladding Being Fitted to the Sixth Floor

The wall build-up as shown in the drawings and reports listed in Appendix A included the following materials:

a) 3mm Genius Prime aluminium rainscreen panels fixed to 50mm helping hand system
b) 50mm Rockwool Duo Slab fixed as per manufacturers requirements
c) Pressed 3mm galvanised steel top-hat system fixed to horizontal SFS system
d) Siniat Weather Defence board fixed to vertical top hat
e) Siderise cavity barriers fixed as per manufacturers specifications. Horizontally these are open state (RH25, 60/60) and vertically these are closed state barriers (RV 90/60).
f) Mineral/earth wool insulation within the SFS system.
g) Plasterboard inner leaf x 2 layers of 15mm

The drawings show cavity barriers within this external wall type located:

a) Horizontally above the 6th floor.

b) Vertically in line with party walls; AOCA and AJ Cladding have produced drawings for proposed cavity barrier locations.
c) Around the perimeter of windows and doors; the survey completed by Wintech found cavity barriers placed in the cavity above the openings and sat on the soffit panel.
d) Around any service penetrations; the survey completed by Wintech found cavity barriers placed in the cavity above the openings.

Figure 14 – Details from Façade Construction

Figure 15 – Details from Façade Construction

4.8.2 Wall type 6 conclusions

- The external wall is non- combustible.
- The insulation is non- combustible.
- Cavity barriers and fire stopping are provided at interfaces with internal compartment walls
- Overall, the fire risk in this wall type is therefore considered to be **Trivial**.

5. ATTACHMENTS (E.G. BALCONIES)

The building has attachments (e.g. balconies).

Private spaces on top of the flat roof are also provided to the apartments on the 6th floor.

5.1 Attachment type 1 - Inset Balconies

5.1.1 Attachment type 1 information summary

This attachment type is provided on the 1st-6th floors as shown in Figure 16 below.

Figure 16 – Example Timber Inset Balcony

This balcony is formed from the extension of the concrete floor slab. The balcony is then recessed as it is surrounded on two sides by the brickwork façade on 1-5th floors. The surface of the balcony is then finished with a timber decking.

5.1.2 Attachment type 1 conclusions

- The timber decking to the balcony will likely have a reaction to fire classification D, therefore combustible. However, the balconies are only accessed from the individual apartment and are located separately from one another.
  There is no concrete separating one balcony from the one above, the floor of the balcony is timber (1-5th floors). The 6th floor has concrete under the timber decking. In all cases, the timber is laid horizontally. This is significant as the likelihood of fire spread is reduced because of this.
- The glass balustrade is generally non-combustible.
- There is a tenancy policy regarding the use and storage of materials on balconies to limit the risk of fire occurring.
- Overall, the fire risk in this type of attachment is **Tolerable** once the ignition and fuel sources are controlled by the management and tenants.

5.2 Attachment type 2 - Cantilever Balconies

5.2.1 Attachment type 2 information summary

This attachment type is provided on floors 1-5 as shown in Figure 17 below.

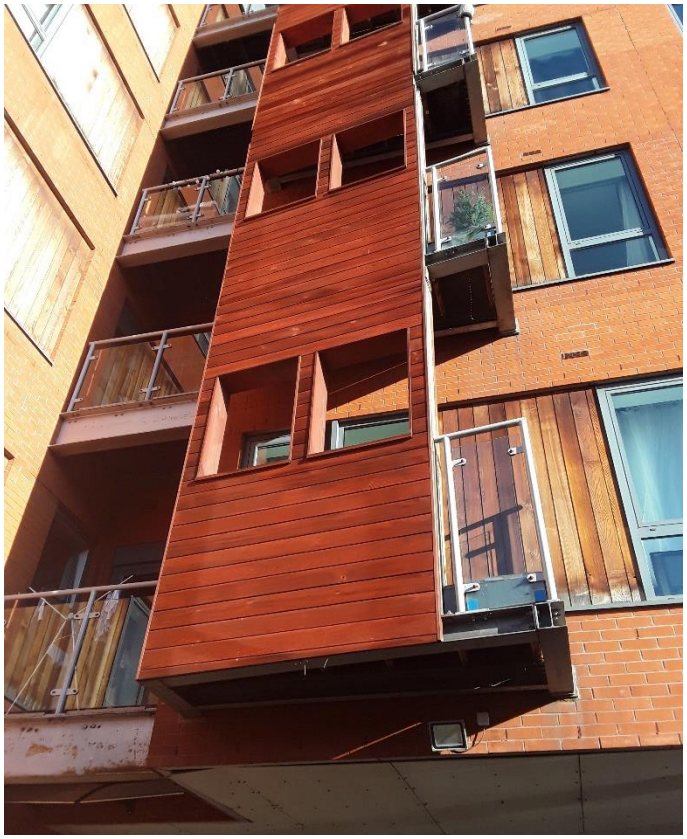

Figure 17 – Example Cantilever Balcony

This balcony is formed from a steel cantilever design at floor level. The balcony has a glass balustrade to one side and timber cladding panel to the others. This timber cladding runs the length of the balconies from 1st-5th floor connecting them all.

5.2.2 Attachment type 2 conclusions

- The timber decking to the balcony will generally have a reaction to fire classification D, therefore combustible.
- The timber cladding panels connecting floors equally will have reaction to fire classification of D when tested to BSEN 13501. This balcony façade is therefore considered combustible. There is a potential risk of fire spread over the timber panels connecting floors. Timber such as this constructed vertically presents a risk of fire spread.
- The glass balustrade is non-combustible.
- Overall, the fire risk in this type of attachment is **Moderate**.

5.2.3 Other items

There is a timber deck located at ground floor that is used by residents, this is a large space. IFC advise that strict control measures are implemented on this deck such that are no additional sources of ignition of fuel brought onto this deck. This should be managed in an identical manner as the balconies.

6. ASSESSMENT OF CONSEQUENCES OF EXTERNAL FIRE SPREAD

6.1 Overview

The earlier sections of this report describe the investigations which have been carried out which would affect the probability of a fire spreading over the external surfaces of the external walls, or via cavities within the external wall.

This section of the report reviews the potential risk that fire spreading over (or through) the external wall would have on the occupants of the building.

The primary factors which affect this are the evacuation strategy for the building and whether the escape routes from the various parts of the building would be at risk of an external fire.

6.2 Occupancy profile

In order to assess the risk to the occupants it is important to understand their risk profile. That would include criteria such as whether they are familiar with the building, whether they may be asleep at certain points in the day and whether the occupants would present any other risk factors (e.g. whether they would need assistance in evacuating).

The building is a conventional residential block of flats. As such the occupancy profile would be expected to be broadly in line with the general population of the country.

As such, the occupancy profile would primarily include people who are familiar with the design of the building although at night they would be asleep.

The occupancy may include a limited number of people who may need assistance in using stairs.

6.3 Evacuation strategy

The building is primarily a residential block of flats although it contains certain back-of-house and non-residential areas. These include:

- Car park; this is an open air car park, located on the south elevation and covered in some areas by parts of the first floor and an external seating area.

- Bin stores.
- Back of house areas (such as plant rooms).
- Small office for Building Management on ground.

The residential areas adopt a defend in place approach where in the event of a fire within one flat, the alarm within that flat would activate and the occupants of that flat would evacuate, but no further alarms would initially occur and further evacuation would only occur if required by the fire brigade on arrival. This is the conventional approach to fire safety in residential buildings in the UK and relies on the fire being contained within the flat of origin.

6.4 Direction of escape routes

Each flat is accessed via internal corridors. Once into the corridors occupants have access to four stairs on levels 1-5 and a single stair per block on floor 6.

The corridors are internal to the building on levels ground – 5 with AOVs at each end. The 6th floor corridors are internal to the building with no windows.

The staircases are fully enclosed in fire resisting construction.

6.5 Overview

Due to the overall layout of the escape routes from the apartments, if an external fire occurred, it is unlikely that smoke and heat from the fire would prevent a risk to any occupants who are evacuating.

7. ASSESSMENT OF RISK

7.1 General

Based on the review above, it has been concluded that in the event of a fire impacting the external walls or attachments:

1) Wall types 1, 2, 3, 5 and 6 would be unlikely to result in the fire spreading either within the external wall cavity or across the surface of the external wall
2) Wall type 4 would not prevent fire spread over the external surface or within the external wall cavity, and so there is a risk of fire spread to other flats

In relation to management standards:

1) The control of ignition sources at ground floor is good.
2) The control of fuel sources at ground floor is good.

Other factors which affect the risk of fire spread are:

1) The building's structure is steel and concrete frame
2) The escape routes from each apartment are well protected from an external fire.

As a result, in relation to the risk factors described in Appendix B, IFC would conclude that:

a) Given the control of ignition and fuel sources present and the construction of the external walls and balconies, the likelihood of a fire spreading over or within the external walls is **Medium**.
b) Should that occur, the potential life safety consequences for the occupants of the building are considered to be **MODERATE**.

Using the matrix in Table 3 IFC would therefore conclude that the overall level of fire risk due to the balconies is **MODERATE**.

As a result, IFC consider that remedial works are required to the external walls.

7.2 Remedial works

Those remedial works would include the following:

a) Replace the Trespa and timber panels on all elevations while providing cavity barriers where this wall type meets another wall type or window i.e. like a picture frame. Cavity barriers are also advised to be provided where an internal compartment wall/fire resistant wall meets the external wall.
b) Replace the timber cladding that connects the balconies that are shown in attachment type 2.

All new materials that are being added to the building must be A2,s1,d0 when tested to EN13501 (Regulation 7 (2)) with a few notable exceptions specified in (Regulation 7 (3)) of the Building Regulations.

IFC also advise that:

c) The Responsible person under the Fire Safety order 2005 advise the fire service of the findings of this report.
d) The FRA for the building is reviewed in light of the findings of this risk assessment.
e) The internal compartmentation be checked to ensure that the internal fire-resistant construction is in place and is able to perform for the required fire resistance period.
f) All life safety systems are working as intended by the designer i.e. fire alarm, AOV in the corridors and head of stair etc.

8. CONCLUSIONS

Based on the assessment that IFC have carried out, the risk of a fire spreading over or within the external walls of the building have been assessed to be Moderate.

That would mean that remedial works are required to the external walls and balconies. The advised remedial work has been described in the previous section.

For ongoing management of the building, the following should be taken into account:

a) Management of the fire risk in areas around the perimeter of the building at ground/podium levels
b) Management of the balconies in terms of restriction on the use sources of ignition and fuel.
c) The timber deck at the rear of the building should be managed in an identical manner as the balconies, described above.

9. LIMITATIONS

Our advice is strictly limited to the scope of our current brief, i.e. to carry out a review of the fire risk presented by the external wall materials and construction within the 20:20 House residential building, Skinner Lane, Leeds, LS7 1BE.

International Fire Consultants Ltd have not reviewed any other issues within the project other than those identified in our report. We offer no comment on the adequacy or otherwise of any other aspects of the development (whether related to fire safety or any other issue) and any absence of comment on such issues should not be regarded as any form of approval. The advice should not be used for buildings other than that named in the title.

Prepared by:

Holly Hawksworth
Fire safety Engineer
International Fire Consultants Ltd. (IFC)

Reviewed by:

Vincent Rafferty
CEng MIFireE, MSc, BEng, MCIBSE, C. Build E MCABE
Director of Fire Safety Engineering
International Fire Consultants Ltd. (IFC)

APPENDIX A LIST OF INFORMATION REVIEWED

The following drawings were reviewed in the preparation of this report.

Table 1 - List of drawings reviewed

Organisation	Drawing reference	Title	Revision/Date
AOCA	19-UK-1001-001	Existing Site Layout Plan	27/11/2019
AOCA	19-UK-1001-002	Existing Cladding Locations	27/11/2019
AOCA	19-UK-1001-003	Existing Cladding Locations and Dimensions	27/11/2019
AOCA	19-UK-1001-004	Existing Cladding Dimensions	27/11/2019
AOCA	19-UK-1001-005	Existing North Elevation Pillar Measurements	27/11/2019
AOCA	19-UK-1001-006	Existing North Elevation Pillar Measurements	27/11/2019
AOCA	19-UK-1001-007	Existing Recessed Balcony Cladding Dimensions	27/11/2019
AOCA	19-UK-1001-008	Proposed Fire Barrier Locations	27/11/2019
AOCA	19-UK-1001-009	Proposed Fire Barrier Locations	27/11/2019
AOCA	19-UK-1001-010	Section A-A Details	27/11/2019
AOCA	19-UK-1001-011	Existing & Proposed Details	27/11/2019
	19-UK-1001-012	Proposed Cavity Barriers	27/11/2019
ADP Architects	W.01	Replacement Wall Cladding Detail	12/2020
AJ Cladding	2020-PH01-EAS-BKT-001	Penthouse 01 East Elevation Bracket Setouts 01	28/10/2021
AJ Cladding	2020-PH01-EAS-BKT-002	Penthouse 01 East Elevation Support Tray Setouts 01	29/10/2021
AJ Cladding	2020-PH01-FS-001	Fire Strategy – Window Level Plan	C01
AJ Cladding	2020-PH01-FS-002	Fire Strategy – Above Window Level Plan	C01
AJ Cladding	2020-PH01-FS-003	Penthouse 01 North Elevation Cavity Barrier Layout 01	C01
AJ Cladding	2020-PH01-FS-004	Penthouse 01 West Elevation Cavity Barrier Layout 01	C01
AJ Cladding	2020-PH01-FS-005	Penthouse 01 South Elevation Cavity Barrier Layout 01	C01
AJ Cladding	2020-PH01-FS-006	Penthouse 01 East Elevation Cavity Barrier Layout 01	C01
AJ Cladding	2020-PH01-FS-007	Fire Strategy at Window Jamb	C01
AJ Cladding	2020-PH01-FS-008	Fire Strategy at Internal Corner	C01

AJ Cladding	2020-PH01-FS-009	Fire Strategy Typical Section	C01
AJ Cladding	2020-PH01-FS-010	Fire Strategy – Cavity Barrier Installation Information	C01
AJ Cladding	2020-PH01-FS-011	Fire Strategy Window Head Detail	C01
AJ Cladding	2020-PH01-FS-012	Fire Strategy Curtain Walling Head Detail	C01
AJ Cladding	2020-PH01-FS-013	Fire Strategy Genius to Rockpanel Vertical Detail	C01
AJ Cladding	2020-PH01-FS-014	Fire Strategy Genius to Rockpanel Horizontal Detail	C01
AJ Cladding	2020-PH01-FS-015	PH01 Recess 238 Soffit Details	C01
AJ Cladding	2020-PH01-FS-016	PH01 Recess 241 Soffit Details	C01
AJ Cladding	2020-PH01-FS-017	PH01 Perimeter Soffit Details As Proposed	C01
AJ Cladding	2020-PH01-FS-018	External Corner Detail	C01
AJ Cladding	2020-PH01-FS-019	Fire Strategy – Perimeter Soffit	C01
AJ Cladding	2020-PH01-FS-020	Fire Strategy – Soffit Details	C01
AJ Cladding	2020-PH01-FS-021	Fire Strategy at Window Jamb Where Return Leg Is To Be Extended	C01
AJ Cladding	2020-PH01-FS-022	Fire Strategy Window Head Detail Where Return Leg Is To Be Extended	C01
AJ Cladding	2020-PH01-FS-023	Fire Strategy, Wall Vent Penetration Detail	C01
AJ Cladding	2020-PH01-FS-024	Fire Strategy Detail At Compartment Wall	C01
AJ Cladding	2020-PH01-FS-025	Fire Strategy Detail At Recess Internal Corner	C01
AJ Cladding	2020-PH01-FS-026	Fire Strategy Detail To Back Face Of Curtain Walling / Compartment Wall	C01
AJ Cladding	2020-PH01-FS-027	Fire Strategy Detail To South Face – Internal Corner	C01
AJ Cladding	2020-PH01-FS-028	Fire Strategy Detail At Typical Internal Corner	C01
AJ Cladding	2020-PH01-FS-029	Fire Strategy Detail At Compartment Wall	C01
AJ Cladding	2020-PH01-FS-030	Fire Strategy Detail At Recess Corner	C01
AJ Cladding	2020-PH01-FS-031	Fire Strategy Detail – Internal Corner With Joint	C01
AJ Cladding	2020-PH01-NOR-BKT-001	Penthouse 01 North Elevation Bracket Setouts 01	C01
AJ Cladding	2020-PH01-NOR-BKT-	Penthouse 01 North	C01

	002	Elevation Support Tray Setouts 01	
AJ Cladding	2020-PH01-SOU-BKT-001	Penthouse 01 South Elevation Bracket Setouts 01	C01
AJ Cladding	2020-PH01-SOU-BKT-002	Penthouse 01 South Elevation Support Tray Setouts 01	C01
AJ Cladding	2020-PH01-WES-BKT-001	Penthouse 01 West Elevation Bracket Setouts 01	C01
AJ Cladding	2020-PH01-WES-BKT-002	Penthouse 01 West Elevation Support Tray Setouts 01	C01

The following reports were reviewed in the preparation of this report.

Table 2 **- List of reports reviewed**

Organisation	Report reference	Title	Revision/Date
Wintech	05218/JY/XX/50316/WL/01	Intrusive Survey of ACM Cladding	03/08/2020
Ballymore	-	External Walls Materials Register	1.4
Billinghurst George & Partners	-	Structural Calculations – Vertical Tophat	14/10/2020
Wintech	*Draft Issue*	Performance Specification for the Refurbishment of: Rainscreen and Cladding	02/09/2020
Wintech	05218/JY/KEA/50218/WL/01	Remedial Requirements Specification Aluminium Cladding System – Phase 1	02/09/2020

APPENDIX B RISK ANALYSIS PROCESS

Likelihood of Ignition and Fire Spreading

This has been judged considering the general conditions present in the premises at the time of assessment and the three possible levels are:

- **Low**: Unusually low likelihood of fire spread as a result of negligible potential sources of ignition, non-combustible materials present, high standards of management.
- **Med:** fire hazards (e.g. potential ignition and fuel sources), generally subject to appropriate controls (other than minor shortcomings).
- **High**: Increased risk of ignition in combination with combustible materials and a lack of management control.

Consequence for Life Safety

This has been judged by considering the nature of the building and the occupants as well as the fire protection and procedural arrangements observed at the time of assessment. The three possible levels are:

- **Slight Harm**: A fire is unlikely to result in death or serious injury of any occupant (other than an occupant asleep in a bedroom where a fire starts).
- **Moderate Harm**: A fire could result in injury to one or more occupants, but unlikely to involve multiple fatalities.
- **Extreme Harm**: Significant potential for serious injury or death of one or more occupants.

Overall Risk Level

The overall risk is estimated using the relationships in the table below.

Table 3 – Ignition and fire spread risk rating

Consequence → Ignition and fire spread likelihood ↓	Slight Harm	Moderate Harm	Extreme Harm
Low	Trivial risk	Tolerable risk	Moderate risk
Medium	Tolerable risk	Moderate risk	Substantial risk
High	Moderate risk	Substantial risk	Intolerable risk

Table 4 – Suggested timescales for delivery of recommendation

Risk level	Recommendation and suggested timescale
Trivial	No action is required, and no detailed records need be kept.
Tolerable	No major additional controls required. However, there might be a need for improvements that involve minor or limited cost.

Moderate	It is essential that efforts are made to reduce the risk. Risk reduction measures should be implemented within a defined time period. Where moderate risk is associated with consequences that constitute extreme harm, further assessment might be required to establish more precisely the likelihood of harm as a basis for determining the priority for improved control measures.
Substantial	Considerable resources might have to be allocated to reduce the risk. If the building is unoccupied, it should not be occupied until the risk has been reduced. If the building is occupied, urgent action should be taken.
Intolerable	Building (or relevant area) should not be occupied until the risk is reduced.