
EXTERNAL FAÇADE REVIEW, HABITAT

Façade Remedial Consultants Ltd

Carried out by

TRI FIRE



CONSULTANTS - FIRE ENGINEERS - SURVEYORS

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Review carried out by Tri Fire Ltd

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1 Instruction

Tri Fire Ltd was commissioned by Façade Remedial Consultants Limited (FRC) to undertake a holistic fire safety review of Habitat, Woolpack Lane, Nottingham, NG1 1GJ with regards to the external façade makeup.

We have produced this report based on the External Façade Report produced by FRC, as well as a site visit for familiarisation and visual survey.

The aim of the report is to provide a holistic fire safety review of the property, in line with the consolidated guidance 'Advice for Building Owners of Multi-storey, Multi-occupied Residential Buildings' issued by Ministry of Housing, Communities and Local Government (MHCLG) in January 2020. We will identify recommendations for further action, where deemed necessary.

This report has been produced and authorised by Adam Kiziak, Principle Consultant, BSc (Hons), IEng, MIFireE, MIFSM, MSFPE.

2 Summary & Recommendations

Our overall view is that the collective effect of the fire safety measures on the site considered holistically, as opposed to each measure in isolation, is that the external wall systems that are present have a detrimental impact on the overall fire safety of the building. The exterior of the development at this time does not comply with the consolidated guidance 'Advice for Building Owners of Multi-storey, Multi-occupied Residential Buildings' issued by Ministry of Housing, Communities and Local Government (MHCLG) in January 2020. This is due to the presence of combustible insulation found to the spandrel panels, and also timber decking to balconies which are vertically aligned.

The spandrel panels should be removed and replaced with a system achieving Euroclass A2 or better. The presence of a combustible core within the spandrel panels represents a risk of external fire spread and the extent of the panels is such that this may be widespread.

The balconies around the premises are vertically aligned and decked with a combustible timber decking. As such, this represents an opportunity for external fire spread, which is unacceptable. The timber decking should be replaced with materials achieving Euroclass A2 or better.

We concur with the findings of the FRC report an intrusive inspection should be undertaken internally, to confirm the build up of the inner leaf. As the external wall is brickwork, the risk is seen to be low, but there is a need to confirm the internal wall build up.

Our RICS EWS1 form rating is B2, meaning:

B2 - I have concluded that an adequate standard of safety is not achieved, and I have identified to the client organisation the remedial and interim measures required

Option B is for buildings where combustible materials are present in the external wall

We recommend that an annual fire risk assessment is undertaken for the properties, in accordance with the Regulatory Reform (Fire Safety) Order 2005, by a third party accredited fire risk assessor, registered on schemes such as the IFE Fire Risk Assessor Register.

3 Standards and Legislation

3.1 Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order 2005 is the applicable legislation relating to fire safety in non-domestic premises. Under the Fire Safety Order the 'responsible person' is required to undertake a fire risk assessment of their premises, and to ensure appropriate fire safety provisions are in place. Whilst the legislation is not applicable to domestic premises, the common areas of blocks of flats does fall within the scope of the Fire Safety Order. On 19th March 2020 the Government introduced a proposed Fire Safety Bill, which will amend the Fire Safety Order to clarify that the responsible person for multi-occupied, residential buildings must manage and reduce the risk of fire for the structure and external walls of the building, including cladding, balconies and windows.

The Fire Safety Order does not make reference to British Standards although following the recommendations given in a British Standard may be one way of demonstrating compliance with the Fire Safety Order.

3.2 Fire Safety in Purpose Built Blocks of Flats Guidance

This guide is intended to meet the needs of housing providers and enforcing authorities for guidance tailored to purpose-built blocks of flats. The document is a guide to ensuring adequate fire safety in purpose-built blocks of flats, regardless of age. Practical advice is offered on how to assess the risk from fire and how to manage fire safety in such buildings. The document also includes case studies based on the commonly found issues in blocks of flats, with suggested fire safety solutions.

The guide does not introduce new standards or regulations, but builds on existing good practice and guidance currently in place. In particular, it will help landlords, managing agents, enforcing officers and those undertaking fire risk assessments to understand the legislative requirements relating to blocks of flats and to apply them in a consistent and reasonable manner. The document does not set prescriptive standards. Its aim is to provide guidance and recommendations for use when assessing the adequacy of existing fire safety provisions in purpose-built blocks of flats.

It is intended for buildings which have been constructed as purpose-built blocks of flats. It applies to existing blocks only. Fire safety design in new blocks of flats is governed by the Building Regulations 2010 but, once a block is occupied, this guide is applicable.

As the fire risk assessment is concerned with fire safety within the common parts, the flats themselves are outside the scope of the FSO. Accordingly, the scope of the fire risk assessment required by the FSO does not include measures to protect residents from a fire in their own flat.

With regards to compartmentation, the guidance states the following:

The external façades of blocks of flats should not provide potential for extensive firespread. When assessing existing blocks of flats, particular attention should be given to any rainscreen or other external cladding system that has been applied and to façades that have been replaced.

The use of combustible cladding materials and extensive cavities can present a risk, particularly in high-rise blocks. Restrictions are normally applied to the nature of such materials and in particular their surface spread of flame characteristics. Cavity barriers are also required in some circumstances. Assistance from specialists may be required to determine if the external surfaces of walls are satisfactory and whether there is adequate provision of cavity barriers.

3.3 Building Regulations & Approved Document B

The Building Regulation relevant to external facades is B4(1).

'the external walls of a building shall adequately resist the spread of the fire over the walls and from one building to another having regard to the height, use and position of the building.'

Approved Document B is one of a series of documents that give practical guidance about how to meet the requirements of the Building Regulations 2010 for England. These approved documents give guidance on each of the technical parts of the regulations. The approved documents provide guidance for common building situations. Document B relates to fire safety.

Approved Document B Volume 1, 2019 edition, states the following in relation to external fire spread:

The external envelope of a building should not contribute to undue fire spread from one part of a building to another part. This intention can be met by constructing external walls so that both of the following are satisfied.

a. The risk of ignition by an external source to the outside surface of the building and spread of fire over the outside surface is restricted.

b. The materials used to construct external walls, and attachments to them, and how they are assembled do not contribute to the rate of fire spread up the outside of the building.

The extent to which this is necessary depends on the height and use of the building.

3.4 MHCLG Consolidated Guidance

In January 2020 the Governments expert advisory panel issued consolidated guidance 'Advice for Building Owners of Multi-storey, Multi-occupied Residential Buildings'. In support of the Building Safety Programme, the Independent Expert Advisory Panel has issued advice on the measures building owners should take to review ACM and other cladding systems to assess and assure their fire safety, and the potential risks to residents of external fire spread.

The advice represents the Expert Panel's position on the action that building owners should be taking immediately to address the risk of fire spread from unsafe external wall systems, and also covers other issues that have been previously the subject of Advice Notes.

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.

The advice is intended to assist building owners in assessing the safety of residential buildings. This advice does not replace or supersede requirements under the Building Act 1984, Housing Act 2004 or Regulatory Reform (Fire Safety) Order 2005.

When considering the risks building owners should consider the full range of risk factors. The Expert Panel's view is that the vulnerability of occupants is a significant factor in assessing this risk and, in some instances, may be more significant than building height.

For new residential buildings of 18 metres or more (or where building work is carried out on existing residential buildings of 18 metres or more), the government has introduced an effective ban, through an amendment to Regulation 7 of the Building Regulations 2010, on the use of combustible materials in external walls and specified attachments (including balconies, etc.). The ban limits the use of materials in the external wall and specified attachments to products achieving a classification of Class A1 or A2-s1,d0, subject to a number of specific exceptions.

3.5 RICS EWS1 Form

The Royal Institution of Chartered Surveyors (RICS), The Building Societies Association (BSA), and UK Finance have agreed a new industry-wide valuation process which will help people buy and sell homes and re-mortgage in buildings above 18 metres (six storeys).

RICS have been led a cross-industry working group to consider best practice in the reporting and valuation of tall buildings within the secured lending arena, to agree a new standardised process. This is to be used by valuers, lenders, building owners and fire safety experts in the valuation of high-rise properties, with actual or potential combustible materials to external wall systems and balconies. This is endorsed by RICS, UK Finance, Buildings Societies Association, IRPM and ARMA. MHCLG are supportive of the approach.

The External Wall Fire Review process will require a fire safety assessment to be conducted by a suitably qualified and competent professional, delivering assurance for lenders, valuers, residents, buyers and sellers. Only one assessment will be needed for each building and this will be valid for five years.

The assessment of fire risk as described above includes that insofar as is necessary to ensure a reasonable standard of health and safety of those in and around the building, all external wall constructions and any external attachments (e.g. balconies) of the building:

Resist spread of fire and smoke so far as is reasonably necessary to inhibit the spread of fire within the building, and

Are constructed so that the unseen spread of fire and smoke within concealed spaces is inhibited, and

Adequately resist the spread of fire over the walls, having regard to the height, use and position of the building.

The assessment takes account of regulations and published design guidance as were current at the time of construction as well as those which are current at the time of this assessment. It cannot be guaranteed that it would address guidance and regulations which may be introduced in the future.

4 Premises Description

Habitat is a relatively modern development, located in central Nottingham. It consists of ground and seven upper floor levels, and has three stair cores. 2 of the stairs are interlined providing alternative means of escape, and one is a stand alone stairway. There is a lower ground level car park, and podium level courtyard.

The stairways are constructed as a firefighting shaft, meaning they each have enhanced fire resisting construction, a dry riser system, and a firefighting lift. The internal corridors have a range of smoke ventilation systems.

The residential areas of the properties operate a 'stay put' evacuation procedure. 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.

The building is over 18m in height, with the upper most floor level being approximately 30m in height above ground. Good fire service access is available to the site from the entrance road, Woolpack Lane. A dry riser system is provided in the firefighting stairways.

The occupation of the properties is general needs housing, so we have reasonably assumed that the occupants are a typical cross section of the general public. It was not reported that any residents are especially vulnerable or at risk; the premises do not provide sheltered or extra care housing support.

There is seen to be a moderate risk of external ignition, as the property has a small amount car parking adjacent to the building.

The premises is located between two local fire stations, London Road and Carlton. As such, a swift response to any emergency call would be anticipated.

5 External Cladding Review

FRC undertook intrusive inspections of the premises on 27th May 2020, and the information provided from their report has been used as the basis for our assessment. The following summarises the findings of the report with regards to the materials used in the external façade construction, and our view relating to any action that may be required.

5.1 Habitat

Material type - Area 1 was a series of drill test inspections carried out from around the 4th floor slab area of the north elevation facing Woolpack Street. The first of the three drill tests, at the highest point was found to be 100mm engineering brickwork which at approximately 45mm resisted and was found to come up against steel re-bar. A second hole was drilled, in the approximate location of the floor slab, which was again found to be 100mm brickwork which was in front of a 80mm empty cavity onto 45mm foil backed phenolic rigid foam insulation ahead of the steel frame. A third hole was drilled which again was made up of 100mm brickwork, 80mm empty cavity, this time with a small steel foil backed phenolic rigid foam insulation.

Due to the construction of the external wall in this area, prior to undertaking any wholesale remedial works, a further test to the external wall undertaken from internally would confirm the absence of a secondary masonry leaf prior to wholesale remediation works to the masonry areas. Following confirmation of our findings, the below recommendations will apply -

The two options which can be recommended regarding the potential remediation works in this location -

- a) The cavity of the internal wall should be encased with further 75mm+ masonry in this location to adhere to the requirements of provision within Diagram 32, or a fireproof structure/ construction.
- b) The combustible phenolic insulation should be removed from the cavity and replaced with an insulation material which achieves limited combustibility or better in accordance with the provisions of the ADB. Due to the presence of combustible material, in accordance with the guidance from the MHCLG and requirements of the EWS1 form, a Fire Safety Review conducted by a fire engineer is required to comment on potential interim measures as a result of the combustible materials.

Comment - We concur with the findings of the FRC report an intrusive inspection should be undertaken internally, to confirm the build up of the inner leaf. As the external wall is brickwork, the risk is seen to be low, but there is a need to confirm the internal wall build up.

Material type - Area 2 was an intrusive inspection undertaken to the Spandrel Panel on the third-floor floor slab of the North facing elevation facing Woolpack Street. The inspection was made by removing the extract baffle and flue from the panel, which was made up of a 2mm PPC Aluminium face with a 22mm phenolic foam core followed by a 2mm Aluminium inner face. Glued to the back of this panel was a further 50mm of PIR Rigid Foam Kingspan Insulation. Behind the insulation was a large void of 170mm back to the floor slab steel. On further inspection of the void, the window frame could be identified. There was however, no fire collar fitted to the flue penetration through the insulation core.

Due to the presence of combustible insulation, in accordance with the MHCLG Guidance, a holistic fire safety review, undertaken by a qualified Fire Engineer, is also required to confirm the interim measures which may be needed. These reports also consider the risk associated with the cladding regarding potential remediation measures following identification of the materials outlined. Due to the combustibility of these materials, replacement of these spandrel panels would be recommended and may be required.

Comment - We concur with the findings of the FRC report that the spandrel panels should be removed and replaced with a system achieving Euroclass A2 or better. The presence of a combustible core within the spandrel panels represents a risk of external fire spread and the extent of the panels is such that this may be widespread.

Material type - Area 3 was a drill test inspection carried out from the 1st floor of the North Elevation to the right-hand side of the main entrance facing Woolpack Street. The construction was found to be 100mm engineering brickwork supported by an Ancon brick carrying system which was in front of a 80mm empty cavity to a combination of 25mm Kingspan phenolic rigid foam insulation and 95mm mineral wool insulation ahead of the internal plasterboard wall. A secondary hole was drilled on the angle towards the curtain walling section to confirm how the cavity was closed to the opening. A green fire sock could be vaguely identified from the endoscope footage within the edge of the cavity but was not up against the frame.

Our recommendation within this area are consistent with Area 1, with an internal inspection recommended prior to wholesale remedial works. This area should be considered as part of a holistic fire safety review, required under MHCLG guidance due to the presence of combustible insulation.

Comment - We concur with the findings of the FRC report an intrusive inspection should be undertaken internally, to confirm the build up of the inner leaf. As the external wall is brickwork, the risk is seen to be low, but there is a need to confirm the internal wall build up.

Material type - Area 4 was a non-intrusive visual inspection carried out to the 7th floor roof terrace on the south facing elevation. The current pandemic restricted access onto the terrace areas and therefore our inspection was limited from that of the Mobile Elevated Works Platform as deployed in other areas. The Balcony was constructed off the buildings steel frame, bolted back to the building structure with a steel handrail and steel balustrade. The floor of the terrace was the main roof structure of the building which had been decked with concrete paving slabs. The penthouse apartment was fronted with curtain glazing and rainscreen cladding.

It is our opinion that no further recommendations can be made to this area. Human factor plays a large part in the cause of fire. Residents should be reminded of their responsibilities regarding reducing the risk of fire spread.

Comment - No further action is required.

Material type - Area 5 was an intrusive inspection undertaken to the external rainscreen cladding on the seventh floor of the North facing elevation onto Woolpack Street. This had been relocated from its original location. The cladding face was found to be a mild steel sandwich panel consisting of 1.5mm mild steel outer face, a 40mm rigid foam insulation inner core and a further layer of 1mm mild steel making up the internal face. Behind the panel was a large cavity between the face of the panel and the building's steel frame, measuring approximately 450mm. Within the cavity, you can see the plasterboard internal skin to the apartment below with no apparent cavity barrier visible.

The presence of combustible insulation requires completion of a Holistic Fire Safety review, undertaken by a qualified Fire Engineer, with a view to confirming potential interim measures. The consideration of the risk offered by these materials will be considered in line with potential recommendations. Due to the combustibility of the insulation within the construction, replacement of these material may be required.

Comment - Due to the presence of combustible insulation behind the spandrel panels, we concur with the findings of the FRC report, and our advice is that the system should be removed and replaced with a system of materials rated to Euroclass A2 or better. As part of the replacement works, cavity barriers should be provided in line with the guidance provided in section 5.3 of this report.

Material type - Area 7 was a non-intrusive visual inspection carried out to the 3rd floor cantilever balcony on the south facing elevation. The Balcony was constructed with a steel frame, bolted back to the building structure with a steel handrail and balustrade. The floor of the Balcony was of steel frame which had been decked with Timber decking. The balconies continued vertically up the building in line with the curtain glazing. There were also examples of Juliet balconies adjacent. The vertically aligned balconies contained timber decking with no soffit. As a result, the potential for vertical fire spread up the external wall via the exposed decking existed. Given the proximity of openable windows adjoining the balconies which may be of adjoining apartments, there may be risks of ignition.

It is our opinion that the Timber decking would act as an assistant within fire spread and it would be recommended to replace this construction which would achieve limited combustibility or better in accordance with the latest MHCLG Guidance. This construction would also be considered as part of a fire safety review required under MHCLG Guidance. Human factor plays a large part in the cause of fire. Residents should be reminded of their responsibilities regarding reducing the risk of fire spread.

Comment - The balconies around the premises are vertically aligned and decked with a combustible timber decking. As such, this represents an opportunity for external fire spread, which is unacceptable. The timber decking should be replaced with materials achieving Euroclass A2 or better.

Material type - Area 8 was a drill test inspection carried out from the Ground floor roof of the South Elevation close to Area 7. The construction was found to be a traditional 90mm brickwork which was in front of a 70mm empty cavity to a combination of 35mm foil faced phenolic rigid foam insulation, a slight cavity followed by and 105mm mineral wool insulation ahead of the internal plasterboard skin. A secondary hole was drilled on the angle towards the window section to confirm how the cavity was closed to the opening. The window frame was visible with no other cavity closer.

Our recommendation within this area are consistent with Areas 1 and 3, with an internal inspection recommended prior to wholesale remedial works. This area will be considered in conjunction with other areas under a holistic fire safety review required in accordance with MHCLG Guidance.

Comment - We concur with the findings of the FRC report an intrusive inspection should be undertaken internally, to confirm the build up of the inner leaf. As the external wall is brickwork, the risk is seen to be low, but there is a need to confirm the internal wall build up.

5.2 Interim Measures

This report has confirmed a number of remedial actions that are to be undertaken relating to the external fabric of the property. An action plan should be developed for the remedial works, and these actions should be undertaken in a timely manner. However, our view is that the risk is such that there is no requirement for any interim measures, such as a waking watch, to be implemented.

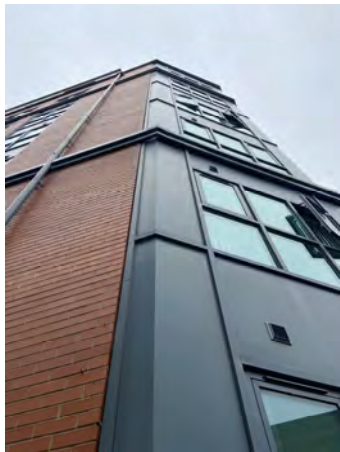
5.3 Other observations

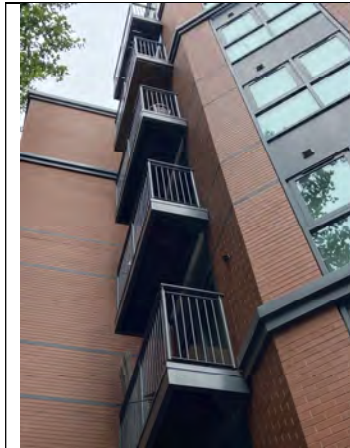
1. In a number of riser cupboards inadequate fire stopping was observed. We recommend a fire compartmentation survey is undertaken to identify all defects, and a remediation programme be implemented.

6 Photos



External façade to the front of the property, showing extensive spandrel panels





Balconies with exposed timber decking



Inadequate fire stopping to riser cupboards

7 Supporting & Reviewed Documents

Supporting

- Advice for building owners of multi-storey, multi-occupied residential buildings. January 2020 by MHCLG.
- Building Regulations 2010
- Approved Document B
- Fire Safety in Purpose Built Blocks of Flats Guidance

Reviewed

- External Façade Report, May 2020 by Façade Remedial Consultants
- Site visit for visual inspection
- FRA produced by Emtom Fire Safety

8 Extent of Report

The report is limited to the information that has been provided.

Statements regarding the fire resistance of the external façade have been based on information provided, and typical expected resistances of materials and construction. They comprise a visual inspection of accessible areas only. No testing, measurements or calculations were carried out as part of this inspection.

The supporting evidence provided in this report has been selected to substantiate the statements made within its content. Additional photographs are available upon request.

It was not possible to verify that the observed conditions were applicable in all similar locations within the façade and therefore it cannot be assumed that are representative of the entire building envelope.

Where structure and façade elements were hidden by cladding and other coverings, the assessment was based on experience of similar buildings and construction. Where necessary, we may recommend further investigation for such items. If significant issues with the façade design beyond the scope of work have been identified, then the analysis of these defects will fall outside the scope of this commission, we will however provide comments based on our visual assessment of the issues.