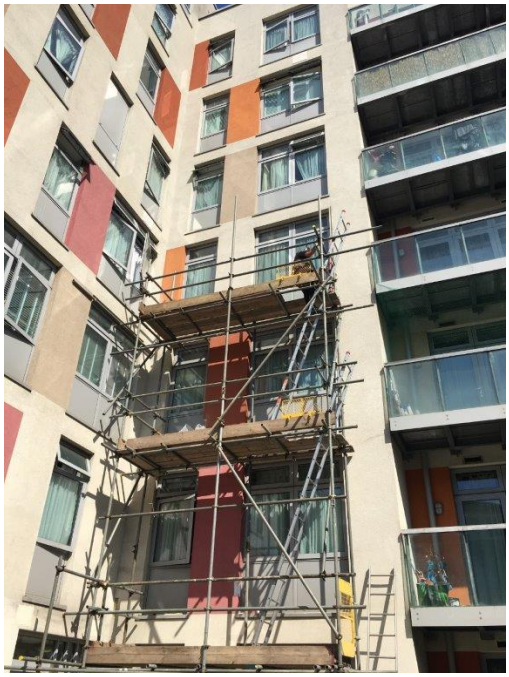
TECHNICAL GUIDANCE NOTE

Fire Risk Assessment of External Cladding Systems on High Rise Residential Building (Phase 3 Report)



101 - 704 Shannon Apartments

5 Ross Way

London, E14 7GF

Commissioned by:	A2Dominion Group	
Report date:	29/03/2020	Report issue date: 03/04/202
Building reference:	157942	

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1. Introduction

The Ministry of Housing Communities and Local Government (MHCLG) has expressed concerns that some high rise residential buildings (HRRBs) throughout the UK may have been fitted with external cladding systems which do not meet the fire safety requirements as set out in the applicable National Fire Safety guidance (Approved document B Volume B (and more recently volume A) in England and Wales and Technical Handbooks section 2: Fire - domestic & non-domestic in Scotland).

In many cases, it has proven difficult to confirm whether the installed systems complied with the applicable guidance at the time of construction/installation, or had been subject to appropriate testing and approval regimes, because relevant historic documentation (such as that which would be included in Building Regulation 38 fire safety files in England and Wales, and the Fire Safety Design Strategy documents in Scotland) was not available or obtainable.

The MHCLG issued a consolidated Advice note on 20th January 2020, which superseded the twenty-two previously issued advice notes and incorporated and updated the advice on the assessment of non-ACM external wall systems (previously advice note 14)

To follow best practice and meet the requirements of the MHCLG consolidated advice note A2 Dominion made the decision to survey all buildings over 18m that are in their portfolio and under their control, with the objective of establishing:

1. What, if any, fire risks the buildings cladding systems present to the occupants.
2. What remedial actions might be required to manage the risks in the shorter term and eliminate them in the longer term.
3. The appropriate documentation of the installed systems, to form the start of a comprehensive fire safety file for each building.

2. Routes to Compliance

There are three routes to compliance which can be adopted during the design phase of a cladding system that is to be applied to a tall building (i.e. a building which under the current guidance is in excess of 18 metres in England and Wales and 11 metres in Scotland, from the upper floor surface of the highest habitable floor, to the ground level on the lowest side of the building).

2.1 The Linear Route

A linear route to compliance is set out in the applicable National Fire Safety Guidance. For existing buildings in England and Wales, National guidance requires the insulation to be of limited combustibility (B-s3,d0 Euroclass) or non-combustible (A2-s1,d0 Euroclass) and non-combustible (A2-s1,d0 Euroclass) in Scotland.

An amendment to Building Regulation 7 requires all components of external wall systems and specified attachments for all new residential buildings and residential buildings undergoing building works in England and Wales, to be non-combustible (Class A1 or A2-s1,d0)

This is defined as materials which are ‘listed’, or which have met the required performance criteria, after having been subjected to specific small-scale fire tests.

There are separate requirements relating to the surface spread of flame for the external surfaces of the façade. These are relative to the building height, its use, and boundary distances and should be Class 0/Low Risk/Euroclass B-s3d2 or better, regardless of whether the insulation is of limited combustibility or is non-combustible.

2.2 Performance-Based Route

To demonstrate compliance via a performance-based route, the complete façade system is tested in a large-scale fire test (BS 8414 part 1 or part 2 as is applicable to the cladding system under test). Façade systems which pass the BS 8414 test are listed in the BRE 135 classification listings.

2.3 The Fire-Engineered Route

In the majority of situations regarding external cladding systems, a fire engineered route to compliance requires an appraisal of the fire risks that are presented by the building design, its use and occupancy type, the individual components and materials and the components used in the cladding system.

This approach, which must be undertaken by a competent Fire Engineer, is currently not accepted by the approving authorities.

3. The Appraisal Process

A2 Dominion has instigated a programme of building surveys, taking into account the experiences and lessons learned in the field.

Initially, the buildings identified as being ‘tall buildings’ with cladding are surveyed to confirm that external cladding was present, to photograph the exterior of the building, and to confirm that access for hydraulic platforms or other access equipment was possible.

A Phase 1 report was then produced, which included all this information, as well as any additional information on the cladding system design and installation that was available. This process eliminated a number of buildings from the need for any further investigation.

The completed Phase 1 report (see Appendix A) was then submitted to Metro SRM in order that the photographs of the building elevations could be marked to show the recommended locations of façade openings. The location of the openings is intended to enable the surveyors to gain access to, and to compile information on, both the cladding systems and the installed fire barriers.

The annotated Phase 1 photographs were returned to the A2 Dominion survey team with an accompanying Phase 2 report template, and a copy of Metro SRM’s Surveyors Guidance Notes (see Appendix B).

The completed Phase 2 report (see Appendix C) was returned to Metro SRM for appraisal and recommendations for next steps.

This Phase 3 summary report is the result of the information that has been gathered on the cladding system installed to the buildings named in the title page.

4. Comments Arising and Recommendations

The comments and recommendations set out in this Phase 3 report are based on the information gathered in the Phase 1 and 2 reports. Any additional information that has been provided and considered is itemised below.

4.1 Additional Information Provided or Considered

No additional information, other than the guidance in Approved Document B, was provided or taken into account in the compilation of this Phase 3 report.

4.2 External cladding

Shannon Apartments is a block of flats constructed from reinforced concrete with masonry walls, which have been finished with a rendered external wall insulation system from ground to the 8th floor.

There are composite panels below all windows.

The building comprises eight storeys and is approximately 22m tall measured from ground level to the topmost floor slab. The report does not state whether sprinklers are provided, although these would not be a requirement of the Building Regulations.

4.3 Insulation

Two types of insulation are known to be provided. Behind the render is expanded polystyrene (EPS approximately 120mm depth) The polystyrene is affixed to a cementitious board which is, in turn, affixed to the masonry.

Within the masonry cavity phenolic foam board has been provided. This was noted to be exposed in one location opened up, at the junction between the masonry and rendered insulation.

4.4 Fire Barriers

Fire barriers are required in accordance with Section 9 of ADB. Where compartment floors and walls are provided, the cavity barriers are necessary to prevent spread of smoke and flame and should sub-divide the cavities which could otherwise form a pathway around fire-separating elements.

Extensive cavities are addressed by Sections 9.8-9.10 in ADB and Section 9.10 gives exceptions to the provisions in Table 13. 9.10(d) states that the provisions do not apply to any cavity formed behind the external skin of an external cladding system with a masonry or concrete inner leaf at least 75mm thick…..provided that the cavity does not contain combustible insulation and that the building is not put to a residential or institutional use;

Approved document B also states that any cavity barriers provided should be fixed so that their performance is unlikely to be rendered ineffective by a failure in fire of any material or construction that they abut.

Cavity barriers should be provided in accordance with Diagram 33 below.

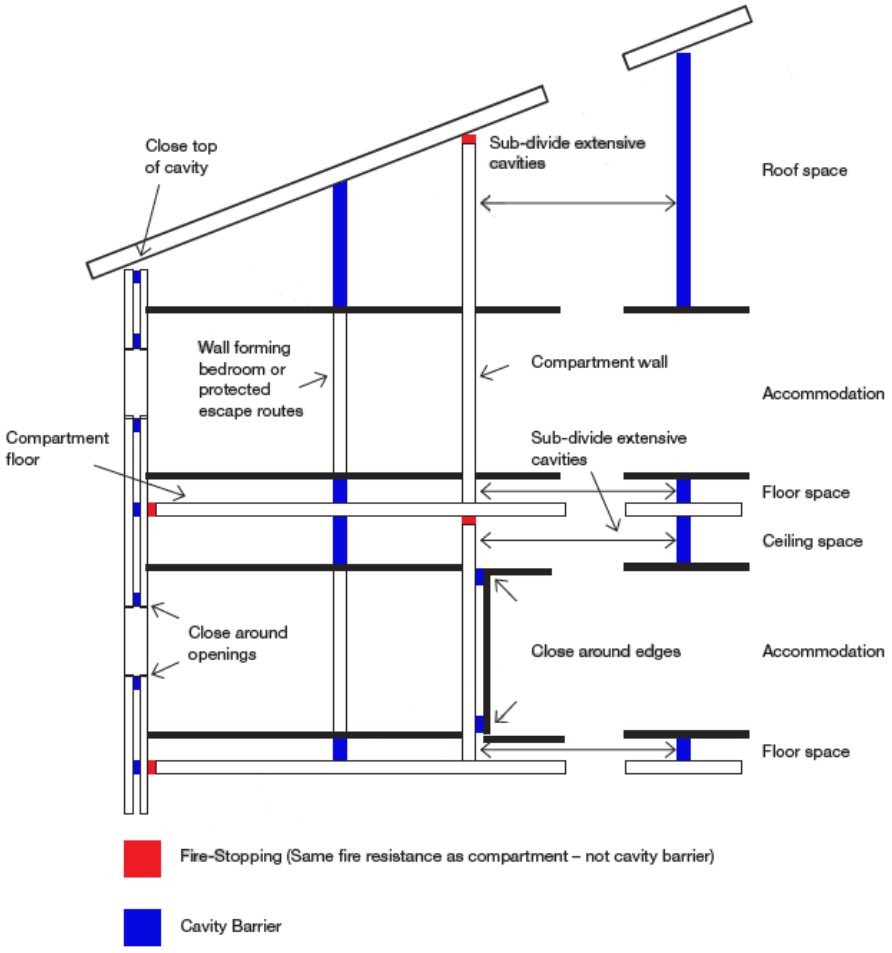


Figure 4.1 Provisions for Cavity Barriers

The mineral wool cavity barrier appears to be full-fill back to the cementitious board. However, it was noted that a cavity between the cementitious board and masonry, up to 18mm deep in places, has been created. There are no fire breaks in these cavities so it is assumed they are continuous from floor to roof level. A cavity barrier should be present at each compartment floor and wall level in this cavity.

No cavity closers were found during opening up around windows and were present in some locations, but not all, where compartment walls were located.

4.5 General comments

From the opening-up works undertaken in the Phase 2 survey at Shannon Apartments, it would appear that the building has not been constructed in accordance with the Building Regulations.

The insulated render system, which comprises a layer of cement render over expanded polystyrene, has cavity barriers evident at floor slab level, which are mineral wool. However, cavity barriers were not found in all locations where vertical barriers would be expected nor around openings such as windows.

It was also noted that a cavity between the cementitious board and masonry, up to 18mm deep in places, has been created. There are no fire breaks in these cavities so it is assumed they are continuous from floor to roof level. A cavity barrier should be present at each compartment floor and wall level in this cavity.

This means that a fire involving the insulation can pass unchecked around the barrier between compartment floors, affecting adjoining compartments and potentially leading to de-lamination of the render and full involvement of the insulation in fire.

No cavity barriers were noted around openings such as windows and doors. This was not a requirement of the manufacturer's design at the time of construction however, this is required to fully comply with the Building Regulations.

Without the design drawings, it is not possible to state whether the lack of cavity barriers within the insulation is a design or an installation deficiency. These systems are required by the manufacturer's design details to have cavity barriers that extend out to the inside of the render at each compartment floor level.

4.6 Recommendations

Further works are required since the building does not meet the requirements of the Building Regulations.

Cavity barriers are required to be provided at each floor level and compartment wall. This could be achieved by opening up the render at each floor level and inserting a full width cavity barrier before making good the render.

Cavity barriers are also required around openings in the facades such as windows and doors.

It is not known whether the render is a cement or acrylic render. If acrylic, this should be over-rendered, once the cavity barriers have been installed correctly, with a system such as StoVario which will achieve compliance with B4 and BR 135.

Appendix 4.6 A. External Wall Hazard Appraisal tool

In grading the potential fire safety risks presented by the various hazards which are directly and indirectly related to the external wall system, a subjective appraisal must been made of the salient factors which include, but are not necessarily limited to:

- The prevailing circumstances in the building.
- The building's occupancy type.
- The design criteria and maintenance arrangements for the cladding system.
- The fire resisting qualities and the condition and serviceability of the materials and components which make up the cladding system.

The risks arising from each hazard type in relation to, unrestricted fire spread and the life safety risks to occupants and relevant persons, have been appraised in isolation to other risks that may be present, and assessed as trivial, moderate, substantial or intolerable, and assigned an indicative numeric score on the following basis:

Trivial: No matters of concern relating to design, materials, workmanship or building management identified.
Moderate: Isolated and relatively minor faults and errors, relating to either the design, materials, workmanship or building management have been identified.
Substantial: Potentially significant faults or errors, or multiple examples of relatively minor faults and errors, relating to the design, materials or workmanship or building management have been identified.
Intolerable: Significant faults, or multiple examples of significant faults and errors relating either the design, materials or workmanship have been identified.

The combined hazard values for the building, the external wall and the EWS attachments have been assigned an overall numeric value where:
6 = Negligible risk. 9 – 12 = Moderate risk . 15+ = Intolerable risk .
Negligible / tolerable: Presents no significant risk. Current arrangements need to be maintained periodic reviews and inspections are required to ensure no deterioration in arrangements. May require minor remedial works during future upgrades or refurbishments.
Significant: Presents specific risks which, in the short to medium term, are manageable. Will require the implementation of significant interim remedial actions which may include decanting of residents with special needs or who reside in specific parts of the building.
Intolerable: Presents significant risks which are likely to be difficult or impossible to manage. Where managed, interim risk reduction measures are considered feasible, they are likely to likely to require the decanting of some, or in the worst cases, all residents.

Building hazard value

Establish a score of 0, 3, 5 or 15 for each hazard type.

Score→ Hazard type ↓	0	3	5	15
Height	< 11 metres	11/18 metres	>18 metres	
Occupancy risk	Normal	Higher	Disabled / vulnerable	
Means of escape	Two or more protected stairs. Alternative protected escape routes. Compliant travel distances.	Two stairs either of which has dubious protection or adjacent cladding. Extended travel distances. Engineered or managed solutions.	Single stair. Escape via neighbouring demise.	CoP3 designs.
Building fire safety management. As assessed in a suitable & sufficient fire risk assessment carried out under article 9 of the fire safety order 2005.	Overall risk rating of trivial or tolerable.	Overall risk rating of moderate	Overall risk rating of substantial	Overall risk rating of intolerable
NOTE: The perceived hazards and associated risk levels are subjective. The examples in the above columns are not exhaustive and are provided only as indicators of the contributory factors that might be considered			A score of 5 or more indicates an urgent need to reduce the fire risks in the day-to-day operation of the building. Failure to do so might raise the overall risk to intolerable.	

The combined score for building hazard = 4 where:

0 – 6 = Negligible / tolerable. 9 – 12 = Significant. 15+ = Intolerable.

External wall hazard value

Establish a score of 0, 3, 5 or 15 for each hazard type.

Score→ Hazard type ↓	0	3	5	15
Whole system	BR135 listed			
Cladding	Non-combustible and correctly installed	Minor installation errors.	Limited combustibility. Treated timber.	Combustible. Non-treated timber. Significant installation errors
Insulation	Non-combustible and correctly installed.	Minor installation errors.	Limited combustibility.	Combustible. Significant installation errors
Fire barrier	Correctly located and installed.	Minor installation errors.		Missing. Significant installation errors
Ancillary components	Non-combustible and correctly installed.	Limited combustibility. Minor installation errors.	Significant installation errors	Combustible.
Windows	Suitably certified or marked. Steel frame.	Plastic. Timber.		
Spandrel panels	Suitably certified or marked.	Un-certified or unmarked cementitious or inorganic fire resisting material.	Unmarked / uncertified HPL.	Plastic. Timber.
NOTE: The perceived hazards and associated risk levels are subjective. The examples in the above columns are not exhaustive and are provided only as indicators of the contributory factors that might be considered.				

The combined score for building hazard = 16 where:

3 –9 = Negligible / tolerable. 10 – 12 = Moderate. 15+ = Intolerable.

EWS attachments hazard value

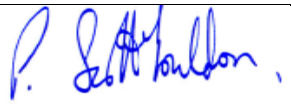
Establish a score of 0, 3 or 15 for each hazard type.

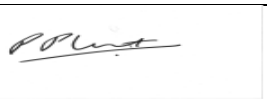
Score→ Hazard type ↓	0 Trivial	3 Moderate	15 Intolerable
Balconies	Not present. No combustible construction, components and materials.	Construction and /or components of limited combustibility.	Combustible construction, components or materials. Timber components without non-combustible substrate.
Heat source panels, solar panels and similar.	Not present. Non-combustible and correctly installed	Limited combustibility. Minor installation errors. Located remote from fenestrations and ignition sources.	Combustible. Significant installation errors.
Decorative attachments.	Not present. Non-combustible.	Limited combustibility. Located remote from fenestrations and ignition sources. Small in size and area.	Combustible. Significant installation errors
	NOTE: The perceived hazards and associated risk levels are subjective. The examples in the above columns are not exhaustive and are provided only as indicators of the contributory factors that might be considered.		

The combined score for building hazard = 3 where:

3= Negligible / tolerable. 6 – 8 = Moderate 9 - 15 = Intolerable.

5. Report Completion

Report Author	Signature	Date
Pat Scott-Youldon B.Eng (Hons) Fire Safety Engineering		30/03/2020

Report Checked By	Signature	Date
Phil Plant MIFSM, MIFiREBSc (Hons) MIFSM		03/04/2020

Appendix A: Phase 1 Report

Please see attachments.

Appendix B: Annotated Phase 1 Photographs

Please see attachments.

Appendix C: Phase 2 Report

Please see attachments.