CLADDING SAFETY Victoria

Protocols for Mitigating Cladding Risk

Implementation

G.03 – Cladding Remediation Standards

Version 3
Date: 28 May 2026

VICTORIA State Government

Aboriginal acknowledgement

Cladding Safety Victoria respectfully acknowledges the Traditional Owners and custodians of the land and water upon which we rely. We pay our respects to their Elders past, present and emerging. We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life. We embrace the spirit of reconciliation, working towards equality of outcomes and an equal voice.

Application of Minister's Guideline 15

These documents contain information, advice and support issued by CSV pursuant to Minister's Guideline 15 - Remediation Work Proposals for Mitigating Cladding Risk for Buildings Containing Combustible External Cladding. Municipal building surveyors and private building surveyors must have regard to the information, advice and support contained in these documents when fulfilling their functions under the Act and the Regulations in connection with Combustible External Cladding on buildings:

a) which are classified as Class 2 or Class 3 by the National Construction Code or contain any component which is classified as Class 2 or Class 3;

b) for which the work for the construction of the building was completed or an occupancy permit or certificate of final inspection was issued before 1 February 2021; and

c) which have Combustible External Cladding.

For the purposes of MG-15, Combustible External Cladding means:

a) aluminium composite panels (ACP) with a polymer core which is installed as external cladding, lining or attachments as part of an external wall system; and

b) expanded polystyrene (EPS) products used in an external insulation and finish (rendered) wall system.

Disclaimer

These documents have been prepared by experts across fire engineering, fire safety, building surveying and architectural fields. These documents demonstrate CSV's methodology for developing Remediation Work Proposals which are intended to address risks associated with Combustible External Cladding on Class 2 and Class 3 buildings in Victoria. These technical documents are complex and should only be applied by persons who understand how the entire series might apply to any particular building. Apartment owners may wish to contact CSV or their Municipal Building Surveyor to discuss how these principles have been or will be applied to their building.

CSV reserves the right to modify the content of these documents as may be reasonably necessary. Please ensure that you are using the most up to date version of these documents.

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Document Notes

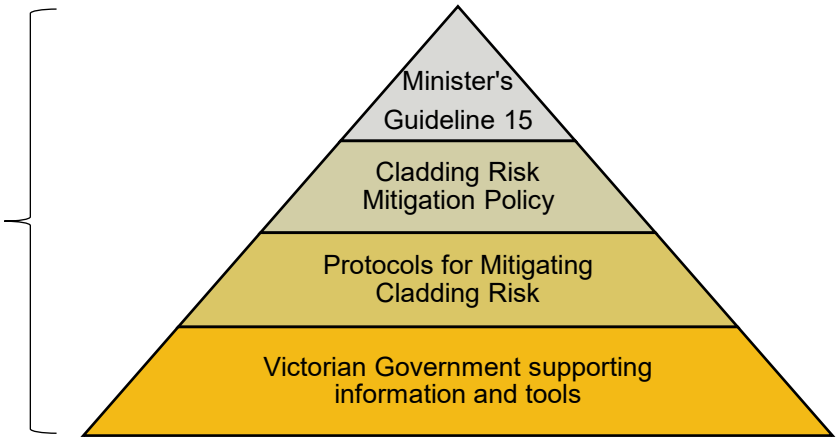
The Protocols for Mitigating Cladding Risk (**PMCR**) is an approach developed by Cladding Safety Victoria (**CSV**) on behalf of the Victorian Government to consistently and systematically address the risk posed by the presence of combustible cladding on Class 2 and Class 3 buildings.

For many buildings, combustible cladding on the facade

- does not present a high enough level of risk to warrant substantial or complete removal of the cladding; but
- presents enough risk to warrant a tailored package of risk mitigation interventions to be introduced that provide a proportionate response to the risk.

The Framework in which CSV operates is outlined below. This represents the overarching structure for managing the combustible cladding risk in Victoria.

Framework



A set of documents has been assembled to describe the purpose, establishment, method, findings and application of the PMCR. The full set of PMCR documents and their relationship to each other is illustrated in a diagram in *Appendix A: PMCR document set and flo.*

There are **seven** related streams of technical documents in the PMCR document set:

A. Authorisation	Codifies the Victorian Government decisions that enable PMCR activation.
B. CRPM Methodology	Specifies the Cladding Risk Prioritisation Model (CRPM) method used for assessing cladding risk and assigning buildings to three risk levels.
C. PMCR Foundation	Defines the PMCR method, objectives and the key design tasks.
D. Support Packages	Captures the relevant risk knowledge and science-based findings necessary to systemise and calibrate PMCR application.
E. CSV Cladding Risk Policy	Establishes key CSV policy positions in relation to cladding risk.
F. PMCR Interventions	Identifies and describes the interventions that the PMCR method can employ to mitigate risk associated with combustible cladding.
G. Implementation	Specifies the standards and procedures that guide PMCR application.

This document is one of the implementation guidelines that describe how and when targeted risk mitigation interventions are applied to reduce cladding risk and make building occupants safer.

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Abbreviations

Term	Meaning
ACP-PE	Aluminium Composite Panel with a polyethylene core
BCA	Building Code of Australia
BOWS	Building Occupant Warning System
Cladding Cluster	An area of combustible cladding on the façade of a building
CFSR	Cladding Fire Spread Risk – a count of the number of SOUs connected by cladding within a Cladding Cluster
CRMF	Cladding Risk Mitigation Framework
CSV	Cladding Safety Victoria
EPS	Expanded Polystyrene
FDAS	Fire Detection and Alarm System
FDCIE	Fire Detection Control and Indicating Equipment
Framework	Cladding Risk Mitigation Framework (CRMF)
IF-SCAN	Initial Fire Spread in Cladding Assessment Number
MBS	Municipal Building Surveyor
MG-15	Minister's Guideline 15
NCC	National Construction Code
PMCR	Protocols for Mitigating Cladding Risk
RIS	The greatest number of storeys calculated in accordance with NCC, Volume 1, C1.2
RWP	Remediation Work Proposal
SOU	Sole Occupancy Unit as defined in the National Construction Code

The function and purpose of the PMCR Standards

The Victorian Government has developed a **standardised** approach for mitigating the risk to life safety posed by the use of Combustible External Cladding[1] on Victorian Class 2 and Class 3 buildings.

Cladding Remediation Standards (the **Standards**) have been developed through Cladding Safety Victoria under a project to design Protocols for Mitigating Cladding Risk (**PMCR**).

The **function** of the PMCR	is to provide evidence-based risk mitigation standards and procedures for designing and delivering tailored cladding remediation works for buildings of different risk levels.
The **objective** of the PMCR	is to ensure that the risk mitigation solutions applied utilise fire safety measures that are proven and available, and that the level of intervention is proportionate to the risk presented by cladding on each building.

These Standards are released for the purposes of applying *Minister's Guideline 15* and the *Cladding Risk Mitigation Framework*, published by the Victorian Government in September 2023.

What is a Standard?

A standard is a document that states procedures or criteria for carrying out an activity. A standard will define a set of rules that when applied, will produce a consistent outcome. The application of a standard will not require scientifically based calculation or judgement.

Cladding risk and the implications for the design of Standards

Under the provisions of the *Cladding Risk Mitigation Framework*, intervening to mitigate cladding risk must bring each building to a state of Acceptable Cladding Risk: meaning that the Relevant Building:

- **achieves a 'Low Cladding Risk' rating; or**
- **presents an overall level of risk to the life and safety of the occupants of the Relevant Building which is reasonably similar or less than the risk which would be presented by the same building, if that building had no Combustible External Cladding.**

This involves assessing and responding to cladding risk on two levels:

1. Building Level

   This level of assessment is focussed on evaluating the safety of egress options for building occupants. It involves consideration of all available paths of egress through and from a building as a single assessment exercise. That is, there may be no need for intervention in relation to one egress path where other 'cladding safe' egress paths are available for each occupant.

2. Cladding Cluster Level

   A building may have one or more areas on the facade with Combustible External Cladding. Each of these areas is referred to as a separate cladding cluster. Each cladding cluster must be assessed independently of all other cladding clusters on the building. The optimal way to apply interventions may vary from cluster to cluster.

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[1] *This is a defined term under Minister's Guideline 15 and means:*

a) aluminium composite panels (ACP) with a polymer core installed as external cladding, lining or attachments as part of an external wall system; and

b) expanded polystyrene (EPS) products used in an external insulation and finish (rendered) wall system.

The method for bringing a Class 2 or Class 3 building with External Combustible Cladding to a state of Acceptable Cladding Risk requires three types of intervention responses to be considered. These types of intervention responses are represented diagrammatically in Figure 1 below.

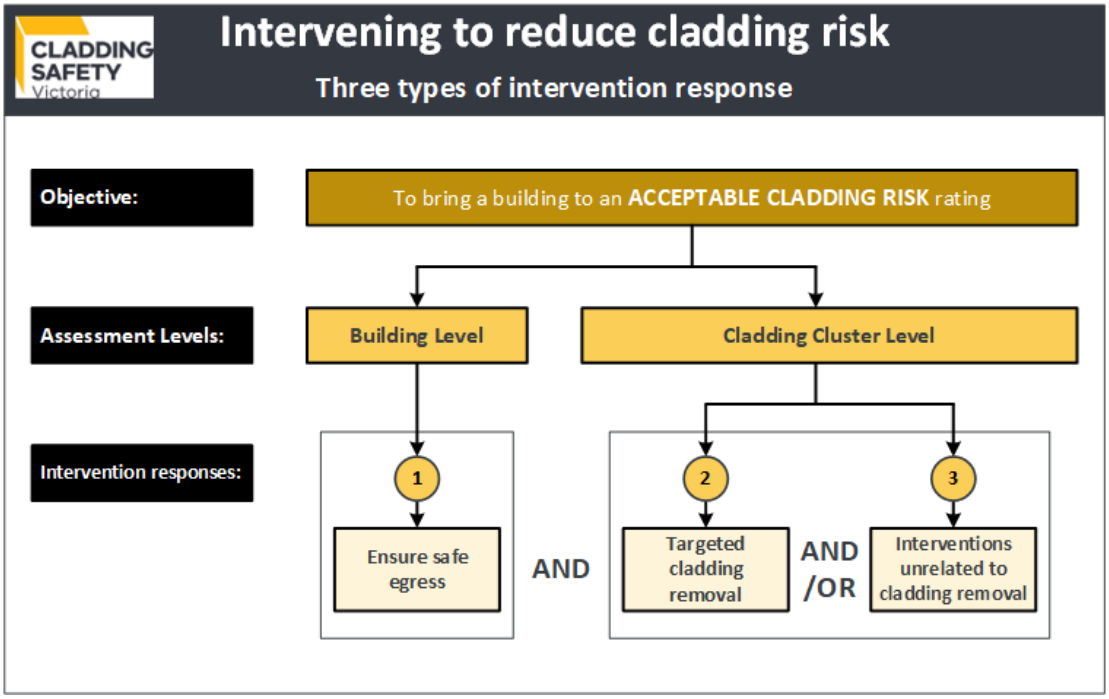


Figure 1: Intervention Response Diagram

The Standards have been designed to provide standardised pathways via which a building can achieve an Acceptable Cladding Risk.

The Standard is based on a significant body of research and analysis, including application of fire engineering principles and scientific consideration of the application of strategies to mitigate risk of fire spread across combustible cladding. Further assessment of the efficacy or effectiveness of the interventions identified in the Standard is not required in the application of this Standard.

The structure of the PMCR Standards

The Standards provide a structured way to:

1. Identify the risk profile of each building (and the risk profile of each cladding cluster); and
2. Specify a 'standard' set of interventions that can be applied to bring each cluster and the building to an Acceptable Cladding Risk.

The PMCR Standards comprise two hierarchical levels of standards. This structure is predicated on a risk perspective that:

- A risk profile can be defined for each building and cladding cluster based on a core set of architectural and risk attributes (focussed on exposure to ignition hazards);
- All buildings and cladding clusters that have the same risk profile can generally be brought to an Acceptable Cladding Risk by applying a common set of interventions (**Primary Standards**); and
- Some buildings and cladding clusters will have unique architectural and risk features that warrant a "departure" from the Primary Standards, and structured "standardised departure(s)" can be formulated (referred to here as **Secondary Standards**).

This two-level approach to the design of PMCR Standards is illustrated in below in Figure 2:

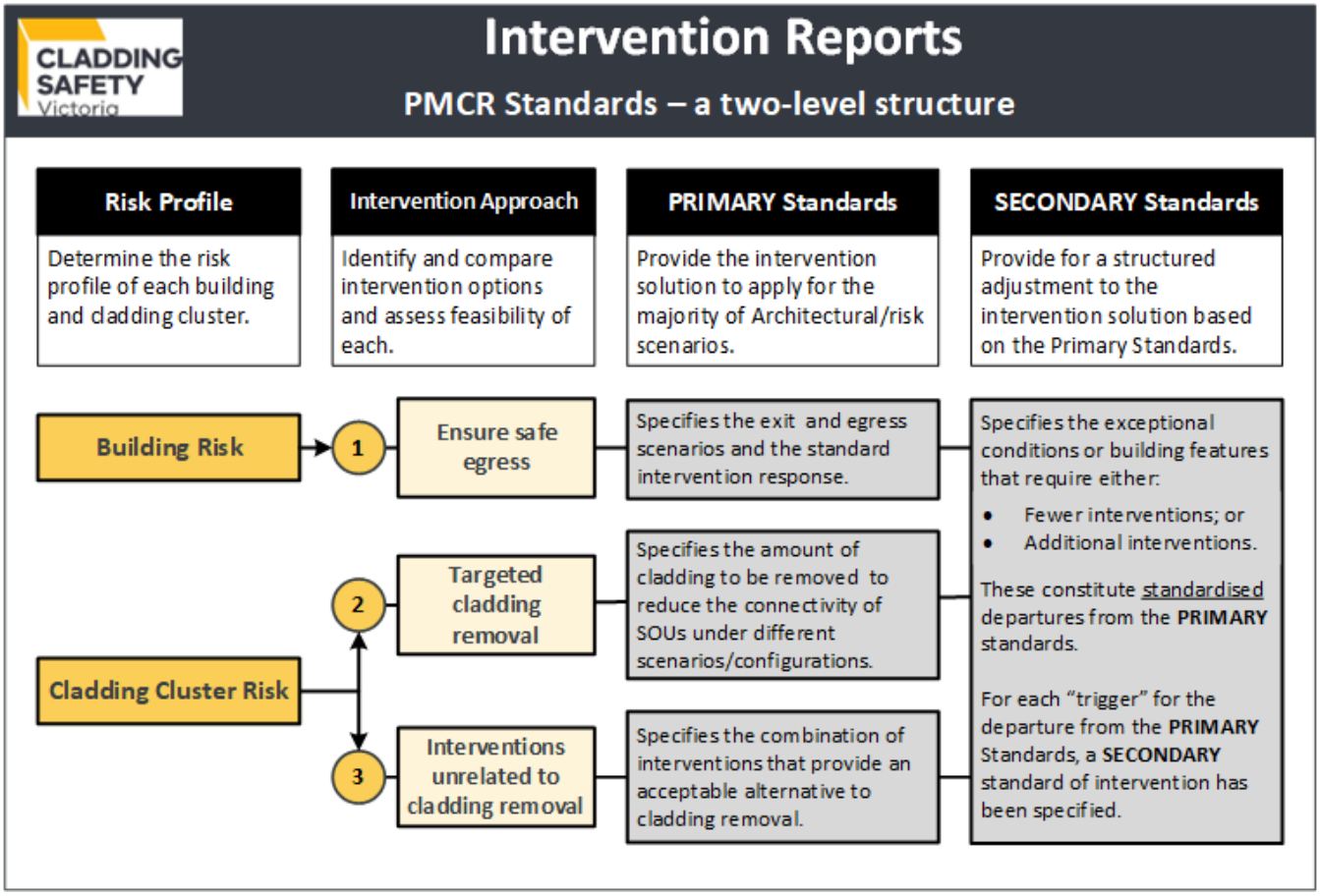


Figure 2: Flow image for 'The Cladding Remediation Standards'

The Standards provides a set of instructions for the application of intervention options to defined building configurations and cladding clusters and are supported by a set of standard operating procedures (*G.01 Standard Operating Procedures*) to guide implementation.

1 Introduction

Buildings which have combustible cladding on the facade may require an *intervention* to enhance life safety and reduce cladding fire risk to an acceptable level.

The level of risk created by the presence of combustible cladding varies substantially for each building. Accordingly, a decision to intervene and the extent of the *intervention* required will therefore also vary.

The Victorian Government has authorised the use of 15 interventions to mitigate cladding risk. The authority for their use is contained in *Minister's Guideline 15 (**MG-15**)* and is supported by the *Cladding Risk Mitigation Framework (**Framework**)*.

The Guideline and Framework are intended to:

- Support Municipal Building Surveyors (**MBS**) in rating the cladding risk of a building and determining what level of intervention is required to ensure that the building has achieved an Acceptable Cladding Risk; and
- Inform owners about how their building's combustible cladding risk is assessed, the structured way in which Remediation Work Proposals **(RWP)** are developed, and what interventions can be applied to bring cladding risk to an acceptable level.

Cladding Safety Victoria (**CSV**) is assisting MBSs and owners by providing information about the cladding risk associated with each building and the steps necessary to remedy that risk. This information is provided in the form of an RWP that applies the cladding risk mitigation methodologies developed by CSV.

Threat barrier analysis can be used to represent how risk-mitigating actions can function to respond to a problem. The CSV method employs this analysis technique to identify the central problem (the 'top event'), in this case a cladding fire, and depict how risk associated with the problem can be mitigated through the implementations of barriers (interventions) designed to control the key hazards identified.

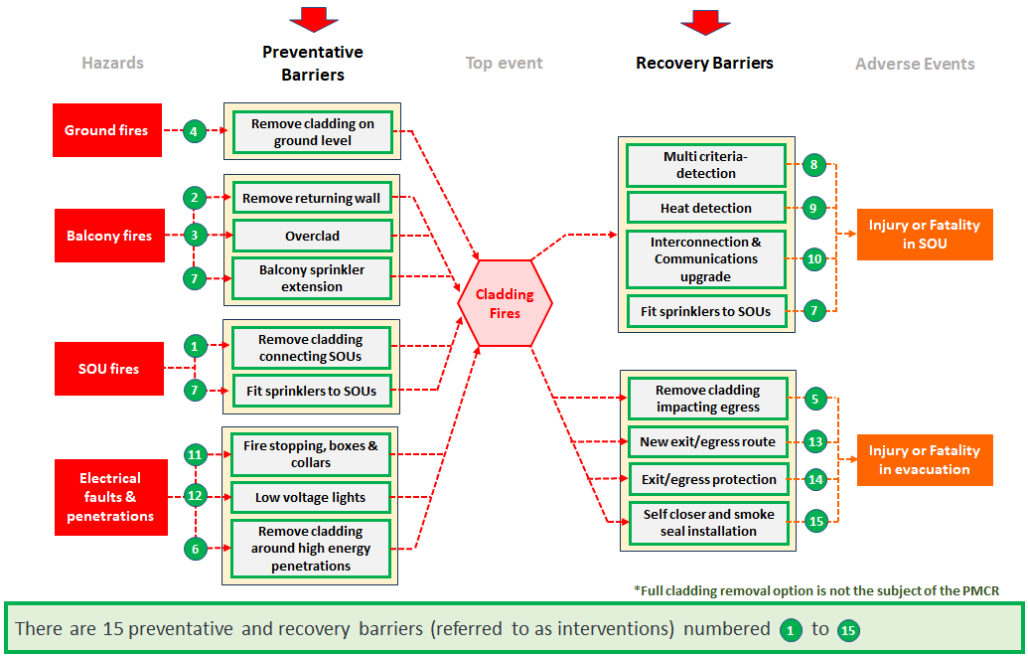


Figure 3: Threat barrier analysis

The 15 interventions in the threat barrier analysis act in different ways to mitigate cladding fire risk.

Each intervention may:

- Respond to one or more of the four identified hazards;
- Function to prevent an ignition source from spreading fire to cladding (i.e. interventions that reduce the likelihood of a fire igniting cladding); and/or
- Function to reduce the adverse impacts for building occupants once a fire has reached cladding (i.e. interventions that reduce the consequences of a cladding fire).

Any risk mitigation solution designed under the Framework must target credible hazards on a building and balance both cladding ignition likelihood and consequence considerations.

1.1 Purpose

This standard outlines the pathways and processes available for cladding risk remediation on Victorian multi-dwelling residential buildings (Class 2 and Class 3). It does that by:

- Introducing: (Section 2)
  - The development of the pathways and procedures that are necessary for a solution to achieve a PMCR remediation work proposal; and
  - The fundamental concepts, terminology, and thinking required to design a PMCR solution.
- Presenting the primary standards that must be used to break the connection between sole occupancy units (SOUs) provided by cladding when opting for targeted cladding removal. (Section 3.1)
- Presenting the primary standards that must be used to treat any retained cladding clusters with risk ratings other than "low"[2]. (Section 3.2)
- Presenting exit remediation diagrams defining the required interventions to reduce cladding risk and ensure safe egress (Section 4)
- Specifying the secondary standards that apply when departures from the primary standards are required to be implemented. (Section 5)
- Providing supplementary technical examples to reinforce key working concepts. (Appendices)

[2] *The Cladding Risk Mitigation Framework defines the risk rating method used for Class 2 and Class 3 buildings with Combustible External Cladding. There are three risk rating levels: unacceptable, elevated and low.*

2 Background

The key function of the PMCR is to provide an acceptable cladding risk for buildings that currently do not have one. This section introduces and explains the key design principles and features of the PMCR that enable a building to achieve an acceptable cladding risk.

2.1 Acceptable Cladding Risk

Acceptable cladding risk, as a defined term of the Cladding Risk Mitigation Framework (**CRMF**), means that a relevant building either:

i. Achieves a 'Low Cladding Risk' rating, or

ii. Presents an overall level of risk to the life and safety of the occupants of the relevant building which is reasonably similar or less than the risk that would be presented by the same building if that building had no Combustible External Cladding.

Cladding Risk Ratings

Prior to determining what level of intervention (if any) is required to mitigate cladding fire risk, a detailed assessment of the cladding on each building is required. Identifying and assessing the cladding on each building allows the building to be placed in one of three risk rating categories, identified in Table 1 below.

	Risk description	
Cladding risk rating category	**Sprinkler protected**	**Not sprinkler protected**
Unacceptable	Risk of fire spread across the Combustible External Cladding of **≥ 4 SOU**	Risk of fire spread across the Combustible External Cladding of **≥ 3 SOU**
Elevated	Risk of fire spread across the Combustible External Cladding of **3 SOU**	Risk of fire spread across the Combustible External Cladding of **2 SOU**
Low	Risk of fire spread across the Combustible External Cladding of **≤ 2 SOU**	Risk of fire spread across the Combustible External Cladding of **≤ 1 SOU**

Table 1: Cladding risk rating categories

The risk rating method recognises the benefits of sprinkler protection to mitigate risk. For the PMCR, a building is accepted as 'sprinkler protected' where sprinklers have been provided within SOUs. This is made on the basis of the recently published sprinkler research that supports the risk position articulated in PMCR document *D.05 – Sprinkler Protection*, and more comprehensively in PMCR policy document *E.02 – Sprinkler Protection*.[3]

Determining the cluster cladding risk and building level risk by employing the risk rating system constitutes a fundamental principle in the implementation of PMCR solutions. At its core, this enables an approach that provides:

A measurable, repeatable, and scalable risk-based approach system where the goal is to identify the existing risk, and then to implement interventions that reduce the building to an acceptable cladding risk.

2.2 Cladding Remediation Pathways

Since the release of the CRMF, CSV has worked to design and implement cladding remediation pathways that are more greatly defined. This integrates and builds on from the risk-based approach discussed in the CRMF.

The cladding remediation pathways can be seen in Figure 4, where three distinct pathways are shown:

1) Targeted removal as a means of directly reducing cladding risk; or
2) Treatment of retained cladding risk with active and passive systems, or a
3) Combination of both.

[3] *Pedersen, K.; Nguyen, K.; Hunt, A. A Risk-Based Approach to Assess the Effectiveness of Sprinklers in Buildings with Combustible Cladding. Fire* ***2025****, 8, 119. https://doi.org/10.3390/fire804011*

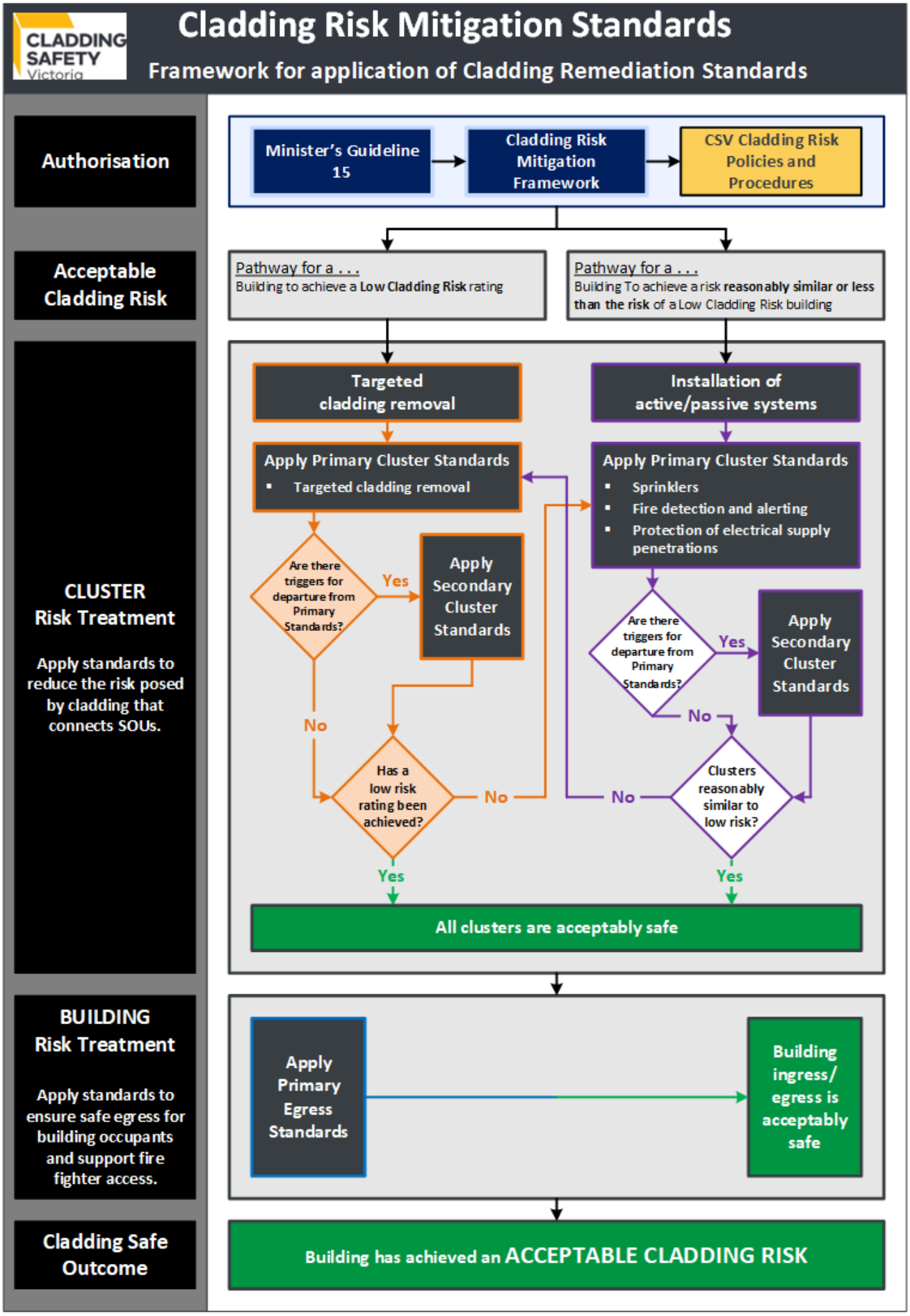


Figure 4: Cladding Risk Mitigation Pathways

Each pathway shown in the Figure 4 diagram above follows application of primary standards, with secondary standards and egress and exit interventions applied thereafter.

2.2.1 Primary and Secondary Standards

Primary Standards refer to the fundamental benchmarks that have been generated through science led research which serve as the foundational guidelines to be attributed to a design.

Secondary Standards include “departures”, concessions and recommendations that may deviate a solution away from the primary standards. These are also standards and manage unique building characteristics or intricacies where necessary.

2.2.2 Cluster Risk and Building Risk

Cluster Risk is the most accurate representation of the inherent risk posed from fire spreading on cladding facades that adjoin SOUs. It is therefore the first stage in the assessment of potential remediation work whereby reference is made to the treatment of external combustible cladding clusters immediately contacting SOU. This is measured in Cladding Fire Spread Risk (**CFSR**), and the corresponding response typologies range from A-I. The worst CFSR measured on each building is also known as the building’s IF-SCAN.

Building Risk refers to the risk incurred via elements of cladding that affect the greater building, rather than any individual SOUs. An example of this is combustible external wall cladding that affects occupants egressing the building, or high energy fuel loads of cladding at ground level exits and egress paths.

2.2.3 Cluster risk typologies

Table 2: Cluster risk typologies

Sprinkler Protected Buildings

CFSR	Rise in Storeys: 3	4	5	6 to 8	9 +
0	Type A				
1					
2					
3	Type B1		Type B2		
4	Type C1		Type C2		
5					
6					
7 +	Type D				

Non-Sprinkler Protected Buildings

CFSR	Rise in Storeys: 3	4	5	6 to 8	9 +
0	Type E				
1					
2	Type F				
3	Type G		Type H		
4					
5	Type I				
6					
7 +					

2.3 Considerations

Whilst formulating an RWP, there are two important considerations that must be addressed. The first is to identify the key risk-based considerations that are required to be addressed in each solution to maintain compliance with the CRMF. The second, hierarchical intervention, is a series of RWP design considerations that are available to allow differentiation between comparable solutions so that a clear, prescriptive means of selecting a solution is available.

2.3.1 Key risk-based considerations

Section 3.5 of the CRMF highlights the procedures for assessing RWPs. It specifies that to achieve a successful design, a combination of interventions may be incorporated into a solution to reach acceptable cladding risk. Moreover, where these interventions are used, regard should be had towards prioritising four key criteria and four key fire hazards, which are:

Key Intervention Criteria	***Key Fire Hazard Associated with Combustible Cladding***
1. Removal of Combustible Cladding near ignition sources 2. Preventing fires from reaching Combustible Cladding (3. Preventing fires from reaching residents *4.* Providing early warning of fire	1. Balcony fire 2. SOU fire (flashover) 3. Ground based fire ***4.*** Electrical fire via penetration

2.3.2 Considerations of hierarchical intervention – Highest benefit through prioritisation

✓ The key intervention criteria, along with the key fire hazards, outline the risk-based thinking required whilst working to reduce the risk rating of a cluster or building.

To most effectively apply a PMCR solution, interventions must aim to maximise benefit whilst minimising negative implications. Interventions will provide the greatest overall benefit when incorporating the following considerations, in order of their prioritisation:

1. Life-Safety Risk Reduction

The greatest consideration when implementing solutions is to consider the life-safety risk reduction, since the primary function of a PMCR solution is to enhance the safety of building occupants. Where interventions are applied to a SOU, it must be ensured that an Acceptable Cladding Risk is reached.

2. Cost-Time Reduction

Where multiple solutions are viable to generate an Acceptable Cladding Risk, the overall cost and time implications of a solution should be evaluated. If an option is available to apply a solution in a more cost and time effective manner whilst providing a comparable life-safety benefit, then that solution should be chosen.

3. Disruption Reduction

Lastly, in instances where multiple solutions exist that have comparable costing, time implications, and reach an Acceptable Cladding Risk, consideration should be given to the disruption caused to building occupants during solution implementation. Provided that at least an equal life-safety benefit is achieved, the solution that disrupts residents the least shall be considered the most appropriate.

When applying a solution, standard or otherwise, this hierarchy should be applied where multiple solutions are available. If solutions have identical benefits across the three considerations, all can be recommended.

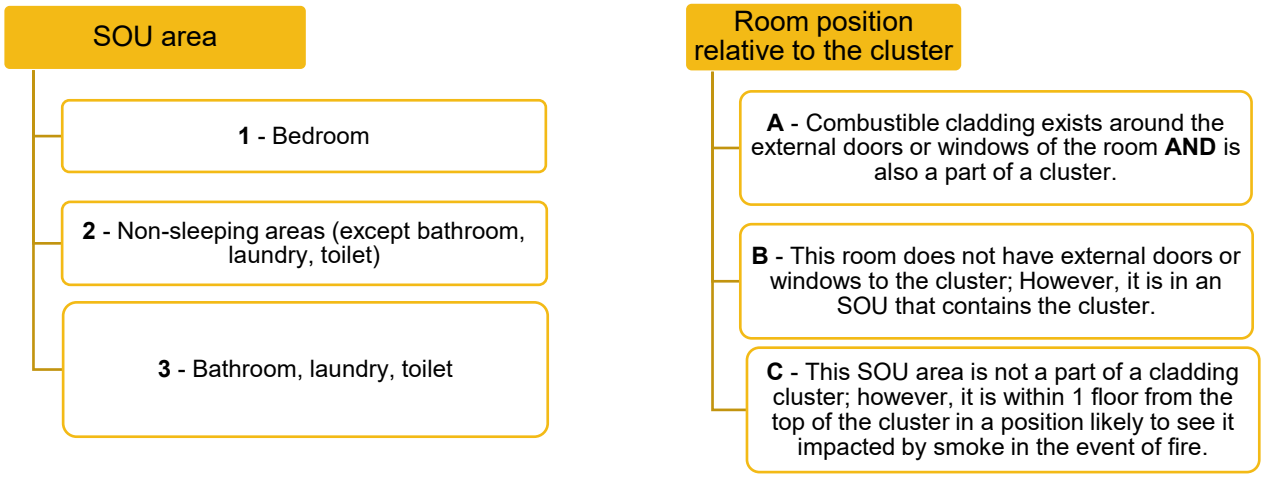
✓ In terms of practical application, the considerations of 2.3.1 should be addressed to ensure compliance with the CRMF and the considerations in 2.3.2 should be used when a cluster/building has multiple viable solutions.

2.4 Design philosophies

Remediation Work Proposals have incorporated design philosophies to simplify the complexity of interventions. At its core, a design philosophy aims to identify the predominant theme of a buildings cluster interventions and allow for this to be scaled to other clusters of the same building where it is viable. It is critical however that a design philosophy, at minimum, provides an equal risk reduction as what the corresponding typology would have otherwise provided.

2.5 SOU codification

In response to the vast and complex configurations of not only SOU size and geometry, but also of how that SOU interacts with combustible cladding, CSV have implemented a codification scheme to help most accurately characterise the risk posed to occupants of any SOU. For this reason, CSV have categorised SOU rooms into three types (1, 2, 3) and the interactions of these spaces with the cladding into another three (A, B, C). A brief description of this codification can be seen below, with visual aid and examples also shown.



Note: where rooms are isolatable (with a door) and it is feasible to be considered a sleeping area (studies, repurposed bedrooms) CSV's worst case risk approach will treat these areas as bedrooms.

Further explanation of the SOU codification can be found in *Appendix B: SOU codification,* alongside worked examples.

2.6 Assumptions

Implementation of the PMCR is founded upon the obligation for building owners to ensure that essential safety measures are maintained in accordance with the occupancy permit, and the builder constructed or installed the required systems/installations as required by any performance solutions in accordance with fire engineering reports and approved plans. The identification of non-conformances during the due diligence process will be noted within the RWP, however the overarching principal shall be that solutions are designed for a building's essential safety measures which have been built and maintained in accordance with the approved plans and occupancy permit(s).

2.7 Non-standard solutions

It is acknowledged that the PMCR may not adequately provide a solution for all buildings and/or all clusters, as although it was designed to capture the vast majority of similar building/cluster configurations, not all will adequately achieve a low cladding risk using PMCR interventions. With this in consideration, PMCR allows non-standard solutions[4] to RWPs subject to –

1. The Building Review Panel (BRP) process including subject matter expert review; and
2. Supervision from a registered fire safety engineer.

To determine when this type of solution is appropriate, the building shall still be marked up with combustible cladding locations, have had the CFSRs measured **AND** subsequently the cluster risk types attributed.

If, however, after designating the building and cluster risks, the methods discussed in this document either do not proportionately capture the required risk reduction **OR** there is a better solution available (regarding risk, cost-time, and disruption reduction etc.), a non-standard solution can be proposed.

[4] The solution must still use PMCR intervention material to design the solution.

3 Primary Standards – Cluster treatment methods

Cluster treatment methodology encompasses all available intervention techniques aimed at mitigating the risk posed by individual clusters to an acceptable level. As previously discussed, this can be achieved via either:

i. Achieving a 'Low Cladding Risk' rating, or

ii. Presenting an overall level of risk to the life and safety of the occupants of the relevant building which is reasonably similar or less than the risk that would be presented by the same building if that building had no Combustible External Cladding.

The achievement of either of the above can only be facilitated via one of the following three solution pathways:

1) Targeted removal as a means of directly reducing cladding risk; or

2) Treatment of retained risk with active & passive systems, or a

3) Combination of both.

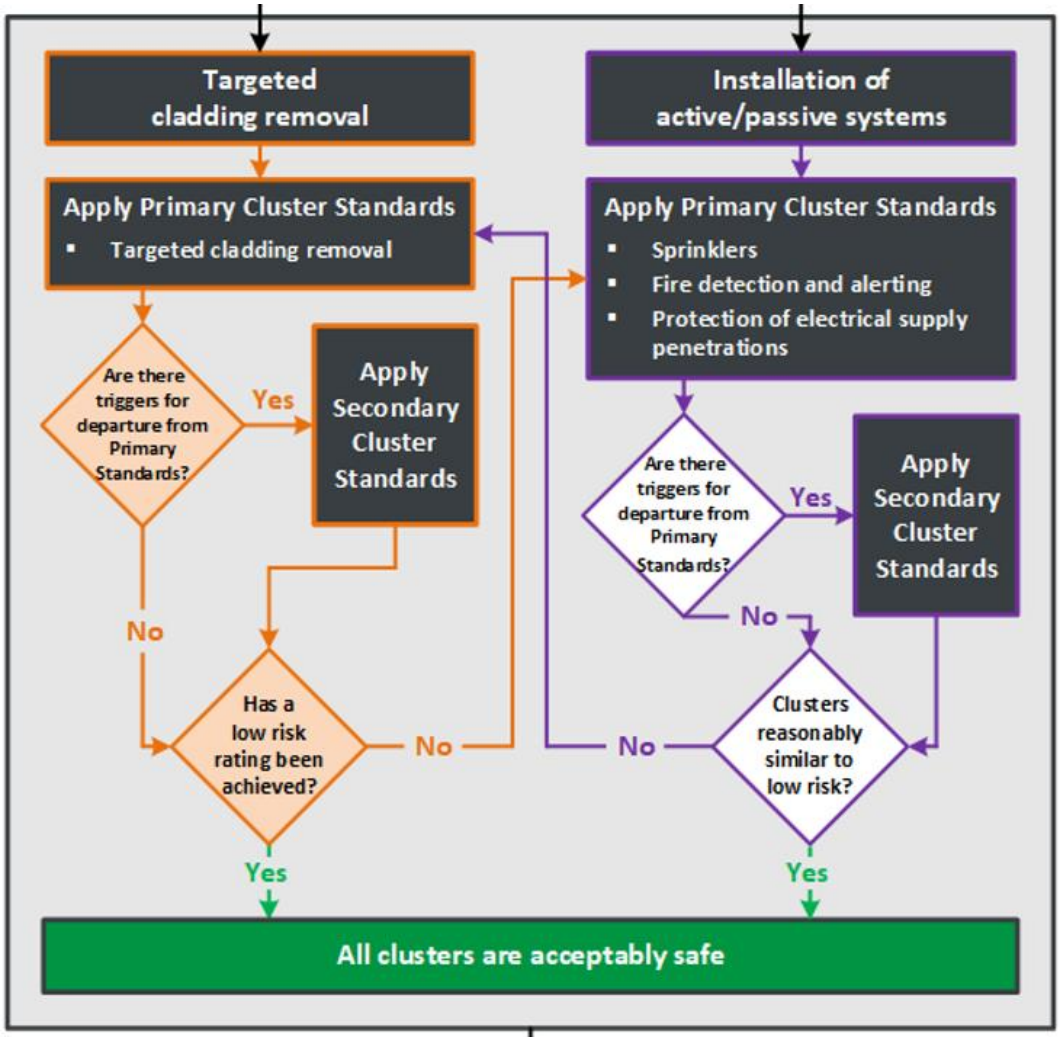


Figure 5: Cluster Remediation Pathways

This section will discuss the methods that can be used to satisfy each of the three pathways using prescriptive means.

3.1 Targeted cladding removal

As illustrated page previous, targeted cladding removal forms one of the two pathways available to achieve a PMCR solution. Provided in this section are the prescriptive rules available to remove continuous sections of cladding (i.e. the absence of any fire breaks) as a means of de-escalating the residual risk for retained combustible cladding. Where targeted cladding removal is used, it must either:

(a) Reduce a cluster to an acceptable cladding risk; or

(b) Reduce a cluster to a lower cladding risk to enable more efficient residual risk mitigation techniques.

Minimum requirements

Throughout this section, emphasis is placed on the term 'minimum' for each cladding rectification option. For clarification, this term indicates that the specifications given are the minimum values permissible that provide a satisfactory level of risk reduction. If, for example, the removal of a larger section of cladding would be more cost effective or be a simpler solution to apply, then it would be permissible as it exceeds the minimum specification.

3.1.1 Vertical configuration - Removal to separate 2 individual SOUs

Buildings with **ACP-PE or EPS** as part of the external wall system in a **vertical** configuration, and where the cluster extends only to a **RIS of 4 or less,** elicit a **minimum** cladding removal of:

(a) A **900** mm strip of cladding spanning between the targeted SOU and the SOU above which;

(b) Extends **not less** than **600** mm above the FFL (Finished Floor Level) of the intervening floor; and

(c) Extends **not less** than **300** mm below the FFL of the intervening floor; and

(d) Extends **not less** than the **full width** of the combustible cladding forming the cluster.

Note: if a waterproofing membrane is present on the ground level of the cladding cluster, a small section of cladding may be retained to maintain the integrity of the membrane.

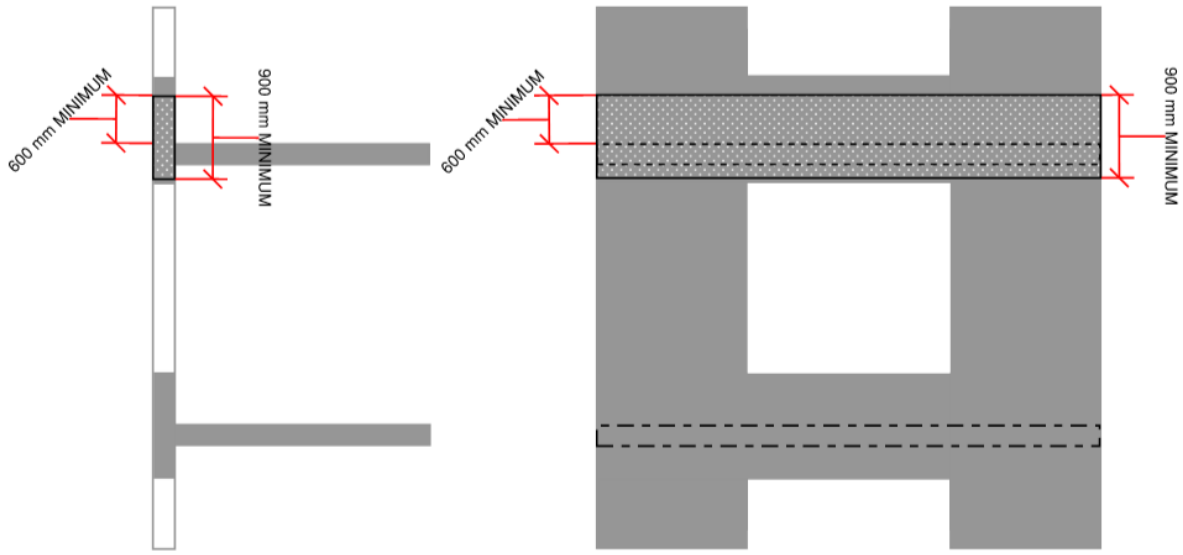


Figure 6: Cross section (left) and elevation view (right) for vertical configuration removal

3.1.2 Horizontal configuration removal

Buildings with **ACP-PE or EPS** attached in a **horizontal** configuration elicit a **minimum** cladding removal of:

(1) **450** mm in width, **centred** on the **internal separating wall** between SOUs which are deemed part of the cluster.

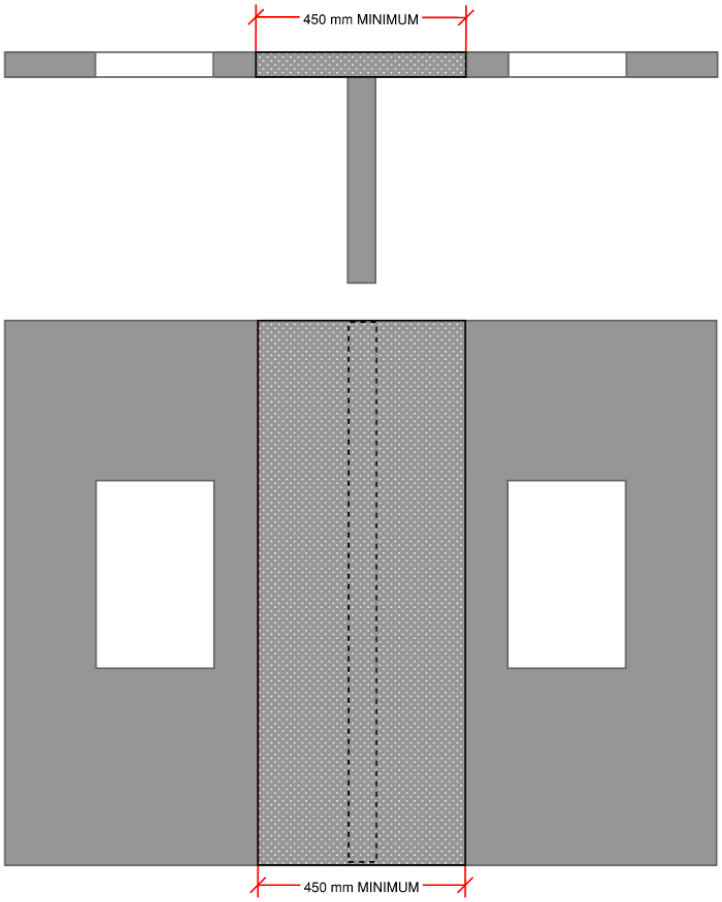


Figure 7: Plan view (top) and elevation view (bottom) of horizontal configuration cladding removal

3.1.3 Combined vertical and horizontal configuration removal

Buildings with **ACP-PE or EPS** attached in a combined **vertical and horizontal** configuration elicit a **minimum** cladding removal of:

(1) **Any** combination of vertical and horizontal configuration removal to sufficiently reduce the CFSR of the cluster to an '**elevated**' or '**low**' rating.

3.1.4 Balcony attachment removal

Buildings with **ACP-PE or EPS** on open or semi-enclosed balcony attachments **only** elicit a **minimum** cladding removal of:

(1) **All** cladding on every **second** balcony for a **vertical** configuration **only**.

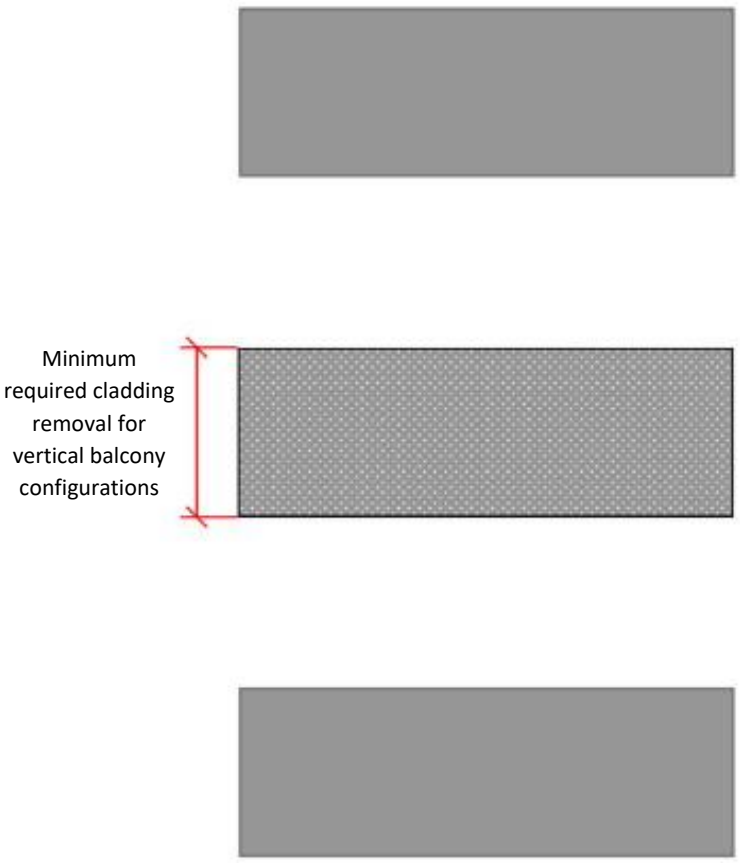


Figure 8: Elevation view of a vertical balcony attachment configuration (left), and a horizontal balcony attachment configuration (right)

3.1.5 Balcony return wall removal/encapsulation.

Balconies with **ACP or EPS** return walls elicit a **minimum** response of either:

(1) Overclad or replace with **non-combustible cladding** affixed to the **entirety** of the balcony return wall frame; **with** permitted retention to the **lower 250** mm of the return wall; **and**

(2) **Removal** of the balcony soffit if also clad in combustible material.

OR

(1) **Removal** of **1500** mm of cladding from the **outside edge** of the balcony return wall, with the **exception** of the **lower 250** mm of the return wall; **and**

(2) **Removal** the balcony soffit if also clad in combustible material.

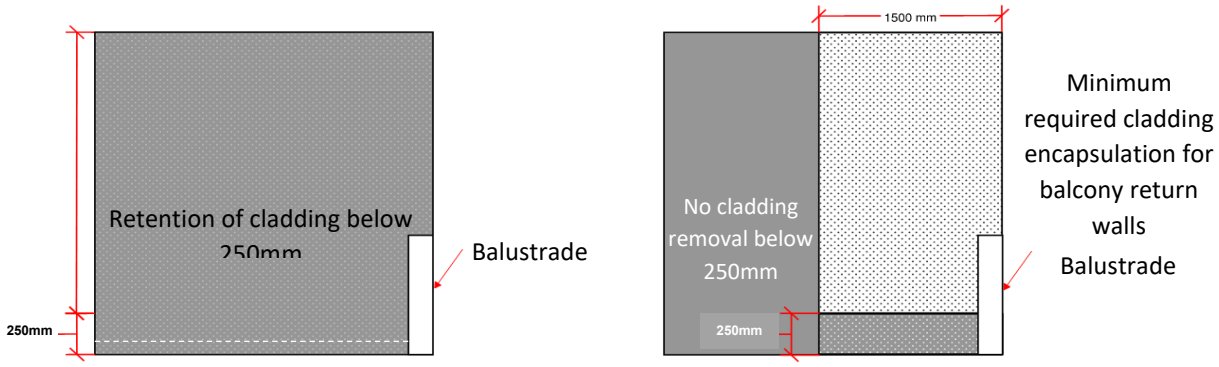


Figure 9: Elevation of balcony return wall cladding encapsulation (left) and cladding removal (right)

Notably, the restriction on the lower 250 mm of the return wall is to prevent potential damage to the delicate waterproofing membrane and the resulting ingress of water to the structure (identified as a key risk in balcony rectification work).

3.1.6 Ground floor cladding removal

Buildings that have combustible cladding that:

- Is located at the ground floor;
- Has a plausible fire source; and
- Can cause/generate a cluster fire.

Require a minimum response of:

For vehicles adjacent to combustible cladding *– See F.02 – Section 4 for more information.*

(1) The removal of combustible cladding corresponding to Table 3; or

(2) The removal of the fire plausibility source through access restriction.

For wastebins or designated wastebin areas adjacent to combustible cladding *See F.02 – Section 4 for more information.*

(1) The removal of combustible cladding corresponding to
(2) Table 4; or

(3) The removal of the fire plausibility source through access restriction.

Table 3: Removal table for vehicles or designated car parking in proximity to ground level combustible cladding

X (m)	EPS cladding			ACP PE cladding			
	H_{safe} (m)	Y_{safe} (m)	$Y_{safe, 3.0}$ (m)	H_{safe} (m)	Y_{safe} (m)	$Y_{safe, 3.0}$ (m)	
0.5	4.5	2.75	1.25	6.0	4.25	2.75	
1.0	3.5	2.75	1.25	4.5	2.75	1.25	
1.5	0.5	1.25	0.0	4.0	2.75	1.25	
2.0	0.5	1.25	0.0	3.5	2.75	1.25	
2.5	0.5	1.25	0.0	2.5	1.25	0.0	
3.0	0.5	1.25	0.0	0.5	1.25	0.0	

Table 4: Removal table for wastebins or designated wastebin areas in proximity to ground level combustible cladding

X(m)	EPS cladding			ACP PE cladding		
	H_{safe} (m)	Y_{safe} (m)	$Y_{safe, 3.0}$ (m)	H_{safe} (m)	Y_{safe} (m)	$Y_{safe, 3.0}$ (m)
0.5	4.0	3.4	1.5	4.9	5.2	2.5
1.0	2.7	2.3	0	4.1	3.8	1.8
1.5	0	0	0	3.2	2.7	0.4
2.0	0	0	0	2.3	0.6	0

Where:

X(m) = The distance (in metres) between the facade with combustible cladding and the vehicle that provides the plausible ignition threat.

Hsafe (m)= The minimum removal height (in metres) from the ground floor level.

Ysafe(m)= The minimum removal width (in metres) from the centre of the car space.

Ysafe,3.0(m)= The minimum removal width (in metres) required up to the height of Hsafe above 3m.

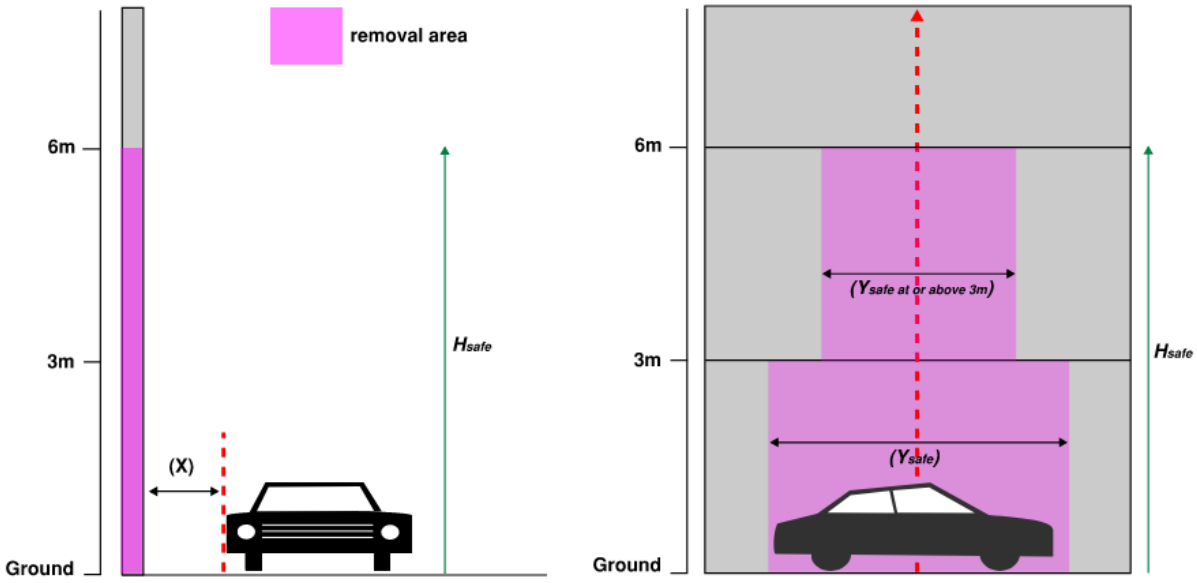


Figure 10: Example schematic for the removal of cladding, corresponding with a vehicle or carparking at distance X, horizontally from walls with ACP-PE cladding

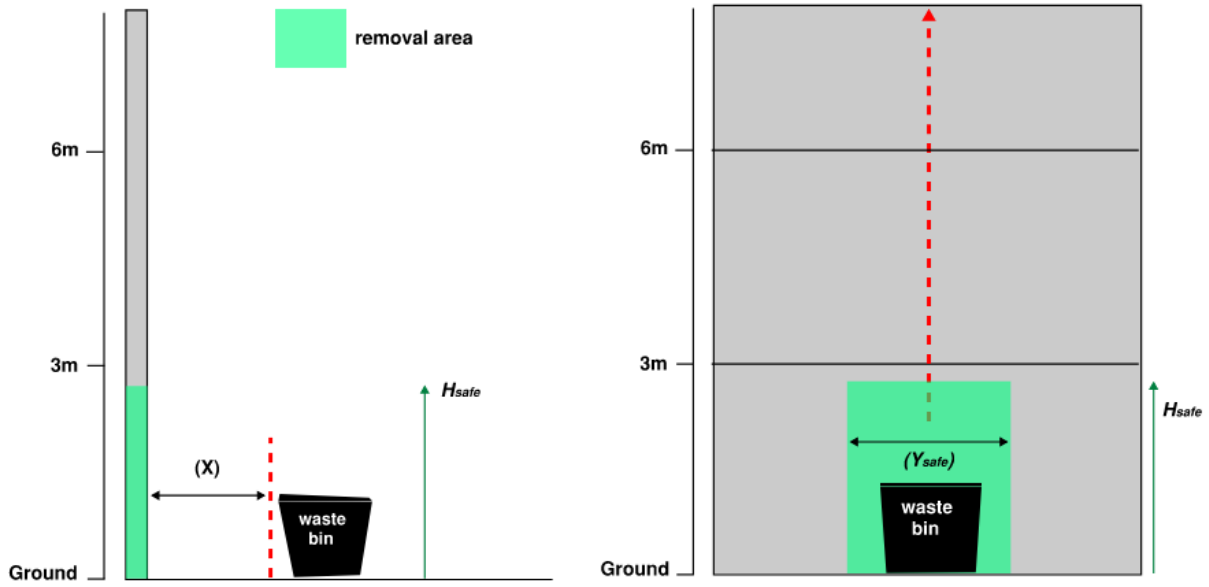


Figure 11: Example schematic for the removal of cladding, corresponding with a wastebin or designated wastebin area at distance X, horizontally from walls with EPS cladding

3.2 Installation of active and passive fire safety systems

Furthermore, review of the Cluster Treatment Pathway diagram in Figure 4: and Figure 5 demonstrates that treatment via installation of active and passive systems is an alternative mode of intervention available to pathways that are not entirely/at all remediated using cladding removal.

Each of the typologies outlined in 2.2.2 have had prescriptive active and passive solutions attributed to them to treat the most observed cluster configurations rapidly and proportionately. Table 2, Table 5, and Table 6 show the cluster risk types as 'Policy Response Types' for buildings with and without sprinkler protection, and designate the prescriptive methods required to satisfy each risk type.

To determine the cluster typology, reference should be made to Table 5 and Table 6 which distinguish a cluster risk as a function of:

- SOU sprinkler protection;
- The uppermost SOU of the cluster position on a building as a measure in rise in stories (RIS);
- Type of combustible cladding present; and
- Cluster Fire Spread Risk (CFSR).

Once a 'Policy Response type" is designated, a brief representation of the corresponding solution is provided in the table along the same row. Further detailed information regarding the solution design should be referred to in Section 3.2 of this document.

Furthermore, the secondary standards may iteratively influence the standard response provided and as such should always be referenced in tandem with the primary standards when implementing a typology into a solution (Section 5).

3.2.1 Fire Detections and Alarm systems upgrades

Where Fire Detection and Alarm System (FDAS) upgrades are nominated as an intervention, the intent of the devices is as follows:

Interconnected smoke sensing within an SOU

Objective: - To provide reliable, interconnected smoke detection (and alarms) within each sole occupancy unit, ensuring that all occupants within the SOU are alerted to the presence of smoke within that SOU.

How to achieve it: - Install smoke alarms that comply with AS3786, or AS1670 smoke detection with sounder bases throughout each sole occupancy unit. All devices are to be interconnected so that upon the detection of smoke within the SOU, all alarms/detectors (in the SOU) sound, alerting all occupants within the SOU to the presence of smoke.

Thermal Detection and BOWS Activation

Objective: - To detect the early signs of a (potential) cladding fire and automatically trigger the Building Occupant Warning System (BOWS), alerting all residents to the potential of a cladding fire as early as possible.

How to achieve it: - Install thermal detectors (or sprinklers) within individual SOUs, that are connected to the BOWS, alerting all residents to the potential of a cladding fire.

Compatibility with Existing Systems

Objective: - To ensure that any newly installed detection and alarm devices work seamlessly alongside the building's existing compliant fire detection and alarm system, without compromising its integrity or performance.

How to achieve it: - All new devices must be selected and installed so that they are fully compatible with the existing fire detection and alarm system. Devices shall be either mains-powered with battery backup or fitted with 10-year sealed batteries, in accordance with the relevant Australian Standards.

3.3 Sprinkler protected buildings – FDAS

This section discusses the fire detection and alarm system requirements for the following policy response types: B1, B2, C1, C2 and D typologies.

Table 5: Active and passive system solutions – for sprinkler protected buildings.

Sprinkler Status	Policy Response Type	Cluster Fire Spread Risk (CFSR)	RIS	Cladding Type	Sprinkler Installation		Detection & Alerting		Penetrations
					in SOUs	on balconies	Smoke Detection (bedrooms)	Smoke & heat detection	Remediation of lights, walls, and cladding
SOUs ARE sprinkler protected	A	0-2	ALL	Both	Existing				
	B1	3	Up to 4	Both	Existing		✓	✓	✓
	B2	3	5+	Both	Existing	✓	✓	✓	
	C1	4-6	Up to 4	Both	Existing		✓	✓	✓
	C2	4-6	5+	Both	Existing	✓	✓	✓	
	D	7+	ALL	Both	Existing				

Review of the table indicates that the nominated active and passive measures for both B and C typologies are identical; however, the associated risk classification (colour nomination) differs. The table therefore implies that C typologies are considered 'unacceptable' under the PMCR. While this position is fundamentally correct, it does not fully or explicitly reflect the outcomes of CSV's current collaborative sprinkler research.[5]

The research indicates that the risk associated with combustible cladding in sprinkler-protected buildings with up to six connected SOUs is acceptable. Accordingly, the same approach applies to all sprinkler-protected buildings with a CFSR of three to six SOUs, irrespective of building height. This is reflected in the cladding risk policy position set by CSV in E.02.

[5] *Pedersen K, Nguyen K, Hunt A. A Risk-Based Approach to Assess the Effectiveness of Sprinklers in Buildings with Combustible Cladding. Fire. 2025; 8(4):119. https://doi.org/10.3390/fire8040119*

Type A – sprinkler protected

Type A response is applicable when we have:

- A cluster fire spread risk of ***up to 2 SOUs*** when
- The building is ***sprinkler protected***

As such the risk rating is Cladding Risk Rating = **'LOW' - *No intervention required***

Type B – sprinkler protected

Type B response is applicable when we have:

- A cluster fire spread risk of ***3 SOUs*** in
- A ***sprinkler protected*** building

As such the risk rating is Cladding Risk Rating = **'ELEVATED'**

Type B intervention

(1) For Fire Detection and Alarm system Interventions (see F.04 – Section 4***)***

(a) **1A Rooms (Bedrooms)** – Provide smoke detection to the openings so that it is installed in centrally located position within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(b) **1A & 1B Rooms (Bedrooms)** – Ensure the location of smoke detection within the SOU is positioned to detect smoke that may impact the pathway between the bedroom(s) and the SOU entry/exit door

(c) **1C Rooms (Bedrooms)** – Provide smoke detection to external openings above clusters, centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(d) **Thermal detection and BOWS activation** – Ensure thermal detection or sprinkler head) exists between the external cladding hazard and the SOU entry/exit door, in a common space within the SOU so that it activates the BOWS in accordance with the requirements of the NCC

Notes

- **Where possible**, it is recommended that detection be installed within 1500mm of the cladding affected opening – it is cladding risk we are seeking to mitigate,
- **Activation** of (a), (b) or (c) shall result in **all** local (smoke) alarms within the SOU sounding (*i.e. all smoke detection to be interconnected within an individual SOU*)
- **When extending sprinklers** to the balconies (as required in the table above), they are to be installed in accordance with Volume One of the NCC, to complement the previously installed sprinkler system.

Type C – sprinkler protected

Type C response is applicable when we have:

- A cluster fire spread risk of between ***4 and 6 SOUs*** in
- A ***sprinkler protected*** building

As such the risk rating is Cladding Risk Rating = **'UNACCEPTABLE'**

Type C intervention

(1) For Fire Detection and Alarm system Interventions (see F.04 – Section 4)

(a) **1A Rooms (Bedrooms) –** Provide smoke detection to the openings so that it is installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(b) **1A & 1B Rooms (Bedrooms)** – Ensure the location of smoke detection within the SOU is positioned to detect smoke that may impact the pathway between the bedroom(s) and the SOU entry/exit door

(c) **1C Rooms (Bedrooms)** – – Provide smoke detection to external openings above clusters, installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(d) **Thermal detection and BOWS activation** – Ensure thermal detection or sprinkler head) exists between the external cladding hazard and the SOU entry/exit door, in a common space within the SOU so that it activates the BOWS in accordance with the requirements of the NCC

Notes

- **Where possible**, it is recommended that detection be installed within 1500mm of the cladding affected opening – it is cladding risk we are seeking to mitigate,
- **Activation** of (a), (b) or (c) shall result in **all** local (smoke) alarms within the SOU sounding (*i.e. all smoke detection to be interconnected within an individual SOU*)
- **When extending sprinklers** to the balconies (as required in the table above), they are to be installed in accordance with Volume One of the NCC, to complement the previously installed sprinkler system.

Type D- sprinkler protected

Type D response is applicable when we have:

- A cluster fire spread risk of greater than ***7 SOUs*** in
- A ***sprinkler protected*** building

As such the risk rating is Cladding Risk Rating = **'UNACCEPTABLE'**

Type D Intervention

(1) ***Removal of cladding by either:***

(a) **Full cladding removal** from identified clusters, OR

(b) **Targeted and significant cladding removal as per section 3.1.2**, that will:

(i) **Reduce cluster size** to achieve an equivalent cladding risk rating of **'Elevated'**, any apply interventions in accordance with the updated 'Cladding Fire Spread Risk' value (*the CSFR*), OR

(ii) **Reduce cluster size** to a level that the buildings cladding risk is covered by the policy requirements of document 'E.02 - Cladding Risk Policy - Sprinkler Protection'.

3.4 Non-sprinkler protected buildings – FDAS

The following table provides an overview of FDAS requirements for non-sprinkler protected in relation to the cluster fire spread risk and penetration requirements (Table 6)

Table 6: Active and passive system solutions - for non-sprinkler protected buildings

Sprinkler Status	Policy Response Type	Cluster Fire Spread Risk (CFSR)	RIS	Cladding Type	Sprinkler Installation		Detection & Alerting		Penetrations
					in SOUs	on balconies	Smoke Detection (bedrooms)	Smoke & heat detection	Remediation of lights, walls, and cladding
SOUs ARE NOT sprinkler protected	E	0-1	ALL	Both					
	F	2	ALL	Both			✓	✓	✓
	G	3-4	Up to 4	Both	✓		✓	✓	✓
	H	3-4	5+	Both	✓	✓	✓	✓	
	I	5+	ALL	Both					

Type E – non-sprinklered

Type E response is applicable when we have:

- The building is ***not sprinkler protected***, and
- A cluster fire spread risk of 1 ***individual SOU***

As such the risk rating is Cladding Risk Rating = **'LOW' - *No intervention required***

Type F – non-sprinklered

Type F response is applicable when we have:

- The building is ***not sprinkler protected***, and
- A cluster fire spread risk of 2 ***individual SOUs***
- As such the risk rating is Cladding Risk Rating = **'ELEVATED'**

Type F intervention (Vertical clusters)

(1) FDAS Intervention *see F.04 – Section 4*

(a) **1A Rooms (Bedrooms) – Lower** – Provide **smoke and thermal** detection to external doors and windows, so that:

Smoke Detection:

(i) Installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

Thermal Detection:

(ii) Must be installed accordance with the NCC and relevant Australian standards; and located within 300-1500mm from the midpoint of the external doors and windows such that it is perpendicular to the opening.

(b) **1A Rooms (Bedrooms) – Upper** – Provide smoke detection to the openings so that it is installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings

(c) **1A & 1B Rooms (Bedrooms)** – Ensure the location of smoke detection within the SOU is positioned so as to detect smoke that may impact the path between the bedroom(s) and the SOU exit in accordance with the NCC

(d) **1C Rooms (Bedrooms) -** Provide smoke detection to external openings above clusters, installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(e) **2A Rooms (Kitchen/Living) – Lower:**

(i) Thermal detection must be installed accordance with the NCC and relevant Australian standards; and located within 300-1500mm from the midpoint of the external doors and windows such that it is perpendicular to the opening

(ii) BOWS – Ensure thermal detection exists between the external cladding hazard and the SOU Exit within the SOU in accordance with the NCC

(iii) Thermal detection recommended to be installed to the SOU directly below the cluster

(f) **Penetrations and Heat sources** require evaluation and intervention in accordance with Section 3.5. *(detail can be found in document: F.03 – 'Interventions for Energy Ignitions')*

Note: – In instances where there is an SOU opening below the cluster that is not part of this cluster, it is recommended that thermal detection be installed and connected to the BOWS. The intent of which is to provide for the additional ignition source below the cluster, with the risk mitigating intervention being the early warning of occupants to the potential of a cladding fire occurring.

Type F intervention (horizontal clusters)

***(2) FDAS Intervention** see F.04 – Section 5.2.2*

(a) **1A Rooms (Bedrooms**) – Provide smoke detection to the external doors and windows so that it is:

(b) Installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(c) **1A** & **1B Rooms (Bedrooms)** – Ensure the location of smoke detection within the SOU is positioned to detect smoke that may impact the path between the bedroom(s) and the SOU exit, in accordance with the NCC

(d) **1C Rooms (Bedrooms)** – Provide smoke detection to external openings above clusters, installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings

(e) **BOWS** – Ensure BOWS activation is possible to each floor level of the cluster. This can be achieved by ensuring thermal detection exists between external cladding hazard and SOU exit, in a common space within the SOU and that is installed in accordance with the NCC (except where the SOU is identified as having a townhouse like configuration (Section 5.2.2 of this document).

(f) Penetrations and Heat sources require evaluation and intervention in accordance with Section 3.5. (detail can be found in document: F.03 – 'Interventions for Energy Ignitions')

Type G – non-sprinklered

Type G response is applicable when we have:

- The building is ***not sprinkler protected***, and
- A cluster fire spread risk of ***3 to 4 SOUs***

As such the risk rating is Cladding Risk Rating = **'UNACCEPTABLE'**

Type G intervention (horizontal clusters)

(1) ***Sprinklers Intervention*** *see F.01 – Section 5*

(a) **All Rooms and Balconies** –installed in accordance with Volume one of the NCC 2022.

(2) ***FDAS Intervention*** *see F.04 – Section 4*

(a) **1A Rooms (Bedrooms)** – Provide smoke detection to the openings so that it is installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings:

(b) **1A & 1B Rooms (Bedrooms)** – Ensure the location of smoke detection within the SOU is positioned so as to detect smoke that may impact the path between the bedroom(s) and the SOU exit:

(c) **1C Rooms (Bedrooms)** – Provide smoke detection to the external doors and windows, installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(d) **BOWS** – Ensure thermal detection exists between external cladding hazard and SOU Exit in a common space within the SOU in accordance with the NCC

(e) **Penetrations and Heat sources** require evaluation and intervention in accordance with Section 3.5. (detail can be found in document: F.03 – 'Interventions for Energy Ignitions')

Notes

- **Where possible**, it is recommended that detection be installed within 1500mm of the cladding affected opening – as it is the cladding risk we are seeking to mitigate,
- **Activation** of (a), (b), or (c) shall result in all local (smoke) alarms within the SOU sounding (i.e. all smoke detection to be interconnected within an individual SOU),
- **When extending sprinklers** to the balconies (as required by the table above), they are to be installed in accordance with the NCC, to compliment the previously installed sprinkler system.

Type H – non-sprinklered

Type H response is applicable when we have:

- The building is ***not sprinkler protected***, and
- A cluster fire spread risk of ***3 to 4 SOUs at height***

As such the risk rating is Cladding Risk Rating = **'UNACCEPTABLE'**

Type H intervention

(1) ***Sprinklers Intervention*** *see F.01 – Section 5*

(a) **All SOUS** – provide sprinklers to **all rooms**, and extend sprinklers to **all balconies** for **all SOUs** of the identified cluster, installed in accordance with the in accordance with the NCC:

(i) AS 2118.1; or

(ii) AS 2118.4; or

(iii) AS 2118.6; or

(iv) FPAA101D; or

(v) FPAA101H.

(2) ***FDAS Intervention*** *see F.04 – Section 4*

(a) **1A Rooms (Bedrooms)** – Provide smoke detection to the openings so that it is installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings:

(b) **1A & 1B Rooms (Bedrooms)** – Ensure the location of smoke detection within the SOU is positioned so as to detect smoke that may impact the path between the bedroom(s) and the SOU exit:

(c) **1C Rooms (Bedrooms)** – Provide smoke detection to the external doors and windows, installed in accordance with the NCC, and centrally located within the bedroom, at a minimum of 300mm from the midpoint of the openings.

(d) **BOWS** – Ensure thermal detection exists between external cladding hazard and SOU Exit in a common space within the SOU in accordance with the NCC

(e) **Penetrations and Heat sources** require evaluation and intervention in accordance with Section 3.5. (detail can be found in document: F.03 – 'Interventions for Energy Ignitions')

Type I – non-sprinklered

Type I response is applicable when we have:

- A cluster fire spread risk of ***5 or more SOUs*** in
- A ***sprinkler protected*** building

As such the risk rating is Cladding Risk Rating = **'UNACCEPTABLE'**

Type I intervention

(1) Targeted cladding removal as per section 3.1

(a) **Full/significant targeted cladding removal** – from identified clusters.

It should be noted here that the option of **targeted removal** to reduce cluster size always exists. This can be done by the removal of cladding by either***:***

(a) **Full cladding removal** from identified clusters, OR

(b) **Targeted and significant cladding removal as per section 3.1.2**, that will:

(i) **Reduce cluster size** to achieve an equivalent cladding risk rating of **'Elevated'**, where intervention will be in accordance with the updated 'Cladding Fire Spread Risk' value (*the CSFR*), OR

(ii) **Reduce cluster size** to a level that the buildings cladding risk is covered by the policy requirements of document 'E.02 - Cladding Risk Policy - Sprinkler Protection'.

3.5 Heat sources and penetrations

Where cladding is retained on balconies that do not have sprinklers installed, heat sources and penetrations require evaluation and intervention in accordance with *Document F.03 'Interventions for Energy ignitions'.*

This only applies to policy response typologies:

- ***Typology B1***,
- ***Typology C1***,
- ***Typology F, and***
- ***Typology G***

Please refer to following sections of document F.03 as required:

(a) ***For lighting remediation*** *see F.03 – Section 5.2.1 – Light Remediation:*

(b) ***For Wall remediation*** *see F.03 – Section 5.2.2 – Wall remediation:*

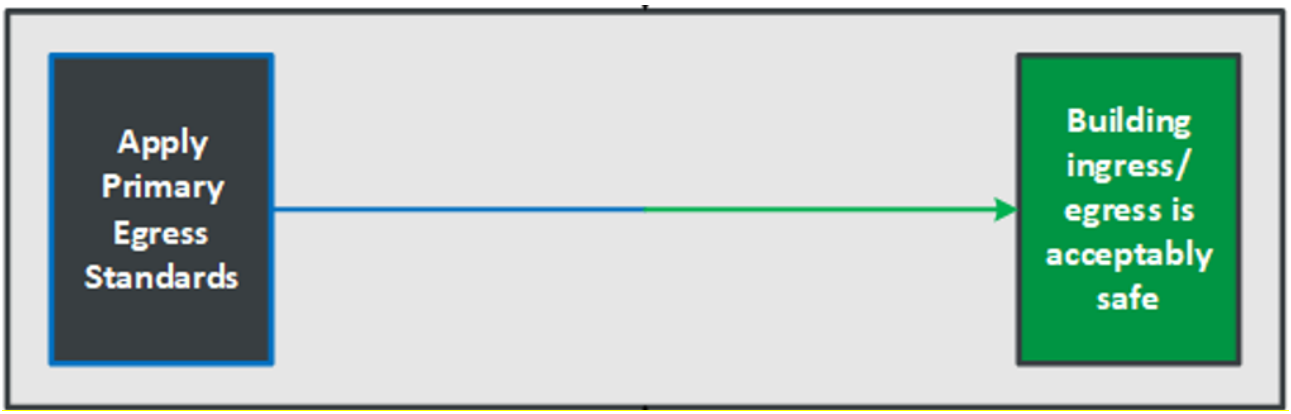
(c) ***For cladding remediation*** *see F.03 – Section 5.2.3 – Cladding remediation:*

The following overview is provided (Table 7), as it appears in document F.03.

Table 7: Required interventions to address energy ignition in policies B1, C1, F, G - standard response overview

	SOUs **ARE** Sprinkler protected		SOUs **ARE NOT** Sprinkler protected	
	ACP/EPS			
Policy Response Type*:	**B1**	**C1**	**F**	**G**
CFSR	**3**	**4-6**	**2**	**3-4**
Interventions to address energy ignitions	**Light remediation: (F.03 Section 5.2.1)** **ACP and EPS** - Licensed electrician to complete comprehensive lighting audit to identify high energy bulbs (e.g., halogen and high wattage incandescent) and replace them with low energy alternative (such as LED). - Verify that all wiring related to lighting is in sound condition, without signs of aging or exposed wires, and verify the installation to comply with the 'Wiring Rules'. Additionally, refer to Section 5.2.1 of this document for further guidance. - Ensure no insulation within the soffit services void is covering the downlight wiring or components and that there are sufficient clearances in accordance with AS 3000.			
	Wall remediation: (F.03 Section 5.2.2) - Licensed electrician to inspect and audit for compliance with the 'Wiring Rules' and serviceability of all electrical installations and penetrations, including those for power points, lights and air conditioners (including required ventilation clearances). Repair or decommission the non-compliant fixture or appliance or installation until such time as a suitable replacement can be installed. - Licensed plumber to audit and inspect for compliance with Australian Gas Safety Standards and regulations all fixed gas appliances and air-conditioner condensers (including required ventilation clearances) for correct installation and serviceability. Repair or decommission the non-compliant fixture or appliance or installation until such time as a suitable replacement can be installed. -			
	Cladding remediation: (F.03 Section 5.2.3) **ACP and EPS** - Overclad and/or cladding removal on affected areas is an approved alternative but needs careful consideration regarding buildability and how the cladding removal or over cladding can be achieved effectively without introducing other complications to wall waterproofing requirements. -			

4 Primary Standards – Building treatment methods



Building treatment methodology encompasses all available intervention techniques aimed at mitigating the risk posed by elements of cladding that affect the greater building, rather than to SOU(s).

4.1 Exit and egress interventions

The primary standard to assess the impact of combustible cladding elements in proximity to building egress paths and appropriate Interventions when required, are documented within Document *F.05 – PMCR – Interventions to assist safe egress*. A Logic Tree (Figure 12 below) nominates steps to assess the impact of combustible elements on occupant egress *(and fire brigade access to a building)* and as necessary, which of the following interventions must be implemented.

4.1.1 Remove cladding impacting egress

Combustible cladding elements used in proximity to an exit will be required to be removed where the building configuration does not provide users with an egress path which is considered safe, having assessed the occupant risks posed by exposure to radiant heat or falling debris from combustible elements above an egress path.

4.1.2 Installation of new exit/egress route

Where the combustible cladding elements in proximity to an exit are not considered to be provide occupants a safe means of egress and removal of cladding elements is not feasible, creating of new exit or egress path may be considered. Regulatory design frameworks do not consider simultaneous fires in different parts of a building as a likely scenario. As such the provision of a designated alternative exit is an intervention that will safeguard egress.

4.1.3 Exit/egress protection

Elements of a building can provide protection by shielding an occupant from radiant heat or falling debris posed by combustible cladding elements used in proximity to an exit. A non-combustible canopy structure is a common building component that can be considered as a means of protection where cladding removal is impractical.

4.1.4 Self-closers and smoke seal installation

The use of self-closers and smoke seals to doors are intended to assist in maintaining the tenability of a designated exit or egress path so that occupants can safely evacuate from a building.

4.2 Exit/egress intervention decision diagram for more than one primary exit

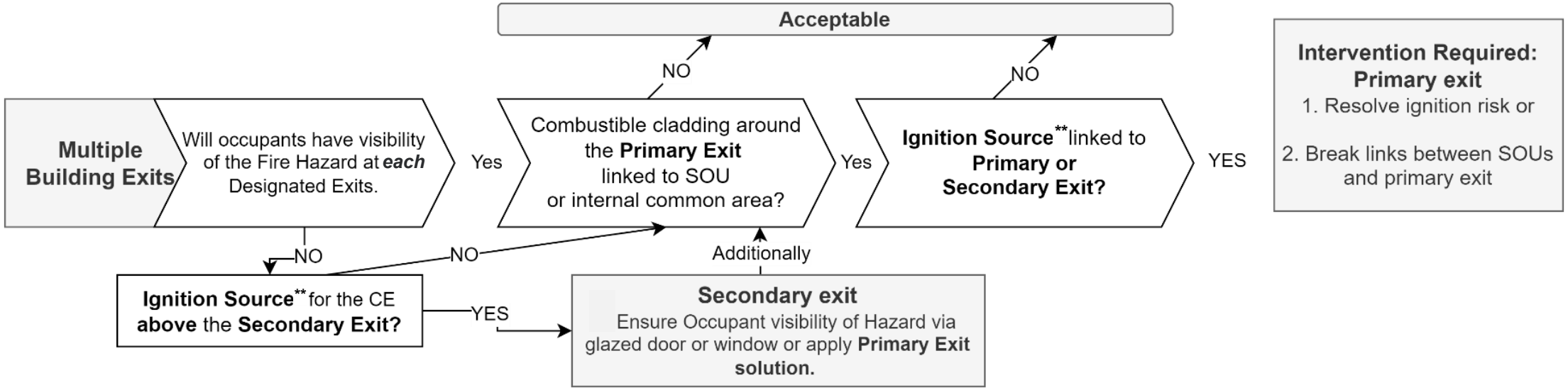


Figure 12 - More than one primary exit intervention pathway:

More than one primary exit intervention pathway

Note:

***Multiple exits** means that each person that could exit out through an exit where combustible cladding is present, also has the option to exit out other, alternative, exit

****Ignition sources** for the combustible elements (**CE**) such as - non sprinklered SOUs, non-sprinklered balconies/common areas, electrical penetrations to ACP, ground level small fire sources

4.1 Exit/egress intervention decision diagram for one primary exit only

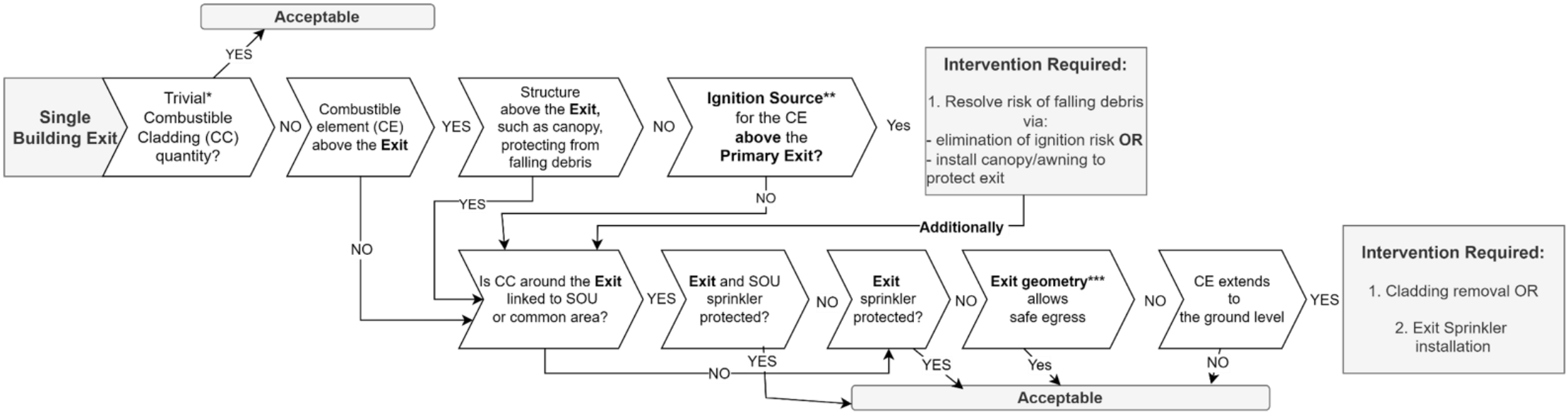


Figure 13: One primary exit – intervention pathway

One primary exit only - intervention pathway

Note:

***Examples of trivial** combustible cladding quantity available in F.05;

** **Ignition sources** such as non-sprinklered SOUs/balconies linked via CE, electrical penetrations to ACP, ground level link-benign fire source risks;

*** **Suitable distance** maintained from combustible element (CE) when exiting the building/no cladding above egress path OR/AND a non-CE provides shielding from CE.

5 Secondary Standards – Building and cluster

This section sets out the secondary standards that a PMCR solution must have regard towards. A secondary standard can be through either a departure, a concession, or a recommendation.

5.1 Departures

Where the conditions discussed in this section are met, a departure from the primary standards shall be permitted. The corresponding departure therefore shall take precedence for that component of the solution.

5.1.1 "Ensure" protocols

Where a solution relies on an existing essential safety measure (ESM) or building feature via an "ensure" clause (e.g. BOWS) and further investigation has uncovered that the ESMs or building features have not been implemented, the RWP shall be revoked, or installation of the referenced system or feature shall be completed as part of the remediation work.

5.1.2 Vertical separation from a cluster

A non-combustible element that separates a cluster from:

1) A door or window opening in a SOU above the cluster; or
2) A door or window opening in a SOU below the cluster,

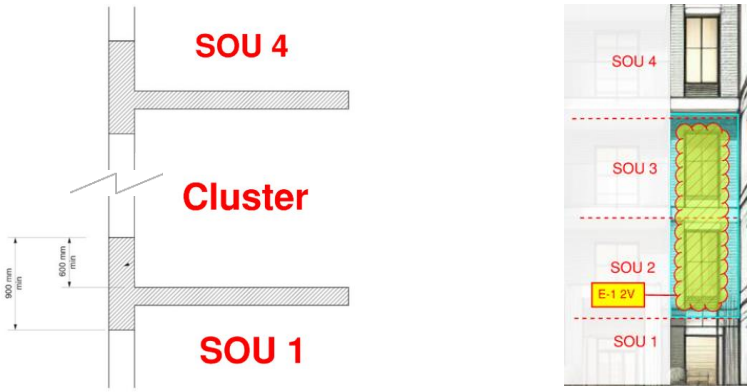
- ***must not*** be less than 900mm in height to mitigate the likelihood of flame propagation. Where the separation is less than 900mm in height and the building is not sprinkler protected, the solution must:

a) Incorporate thermal detection to provide early warning (as appropriate) to mitigate the consequence of flame propagation *to* the cluster *from* the level below the cluster, and/or *from* the cluster *to* the level above the cluster; and

b) Apply targeted cladding removal interventions to create a vertical separation of not less than 900mm; or

c) Apply sprinkler installation interventions to the cluster and the adjoining SOUs that lack the required separation.

Figure 14: Vertical separation between 'cluster' and 'non-cluster SOUs



Above: Typical cluster/non cluster separation, and ***Right:*** SOU 1 and 4 are non-cluster, SOUs 2 and 3 are cluster SOUS

The intention of this standard is to ensure that SOU 1 and 4 in the images "a)"and "b)" above have adequate separation from the cluster. An example of the required separation is the spandrel that separates SOU 1 from the cluster in Figure 14 above - image right. Where there is not a 900mm non-combustible separation from the cluster to the nearest window or door of SOU 1 or 4, an action to remediate is required.

5.1.3 Emergency fire service access

The holistic building design philosophy shall consider each cluster which requires intervention. If analysis of the building access routes, positioning, height and configuration determines that there are clusters which cannot be accessed and subdued by the fire service on arrival then the interventions selected shall prioritise preventative barriers (i.e. cladding removal or sprinkler protection) rather than recovery barriers (i.e. detection and alerting).

5.1.4 High risk commercial spaces

(1) For commercial premises (typically at ground floor level) which are identified in buildings within CSV scope, due diligence shall be undertaken to examine the use of the commercial premises e.g. a restaurant, public house, café etc. Once the current commercial use has been established, the building performance solutions, essential safety measures, compartmentation and exits associated with the commercial premises shall be reviewed to assess any impact on the building SOUs.

(2) Combustible cladding identified on commercial premises which has connectivity to SOUs will be investigated and treated in accordance with the Cluster Treatment Methods (Primary Standards) and combustible cladding risks identified which impact on SOU egress routes or exits will be also treated in accordance with the Building Treatment Methods herein (Primary Standards).

5.1.5 Multi-storey SOU

Where a cluster impacted SOU is more than one storey, it is required that each floor of the cluster is provided with thermal detection.

5.1.6 Type “3A” rooms

Where a SOU in a cluster has a type “3A” room, no intervention is required to that room. However, any room with door access that opens directly into this 3A room should be re-codified as an “A” type room and treated accordingly to the applicable standards.

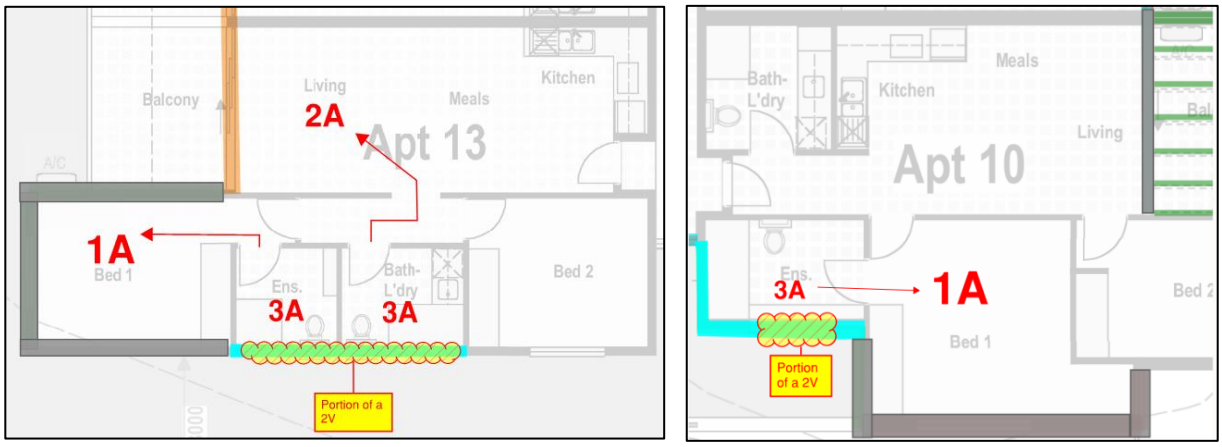


Figure 15 - The rooms that these 3A's are adjoined to become type A's as they now have a greater risk of being impacted by fire

5.2 Concessions

The following concessions are permitted to solutions provided with the specified corresponding criterion.

5.2.1 Sprinkler protected SOUs

If a SOU is sprinkler protected to all rooms, the following concessions can be made:

(1) The BOWS and thermal activation requirements are satisfied ***(except FPAA101D sprinkler systems. Separate heat detection is required where FPAA101D systems are installed)***.

5.2.2 Townhouse like SOU configurations

Townhouse or townhouse-like SOU configurations are typically identified as multi-level SOUs, each served by their own individual exit and are subject to different risk mitigation strategies. Under the PMCR, to be considered a townhouse-like SOU, the subject SOU(s):

(1) Must not have a separate SOU either above or below (i.e. no potential for direct *vertical* cladding connection); and

(2) Must not have share an internal egress path (such as a common corridor); and

(3) Must only have horizontal or special (*i.e. diagonal*) cladding connectivity.

Where SOUs meet the townhouse style criteria detailed above, the following concessions apply:

a) ASE is not required in solution design to satisfy PMCR requirements.

b) Thermal detection and BOWS activation is not applicable to buildings that apartments that do not share a path of egress to outside of the building.

For further detail, refer to PMCR document *G.02 – IF-SCAN procedure and method*

5.2.3 Vertical fire break via horizontal projection

A horizontal projection is considered to provide adequate separation to mitigate the risk of fire spread between 2 elements of combustible cladding, providing the projection meets the following criteria:

(4) the projection must be non-combustible, and

(5) the horizontal dimensions (a) and (c) in figure are not less than 600mm; and

(6) the projection is constructed so that the sum of the height of the projection (b) and the length of the horizontal dimension (c) is not less than 900mm.

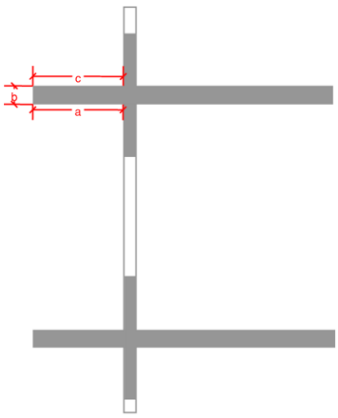


Figure 16 A section view of the horizontal projection dimensions. either the sum of length "a" and height "b" or the sum of length "c" and height "b" must be not less than 900mm

5.2.4 Set-back SOU

Type C SOUs that are set back in a wedding cake formation to provide at least a 1500mm horizontal displacement do not require smoke detection intervention.

NOTE: This can be satisfied by an effective displacement caused by an at least 1500mm balcony. This causes a 1500mm horizontal displacement from the fascia to the opening above.

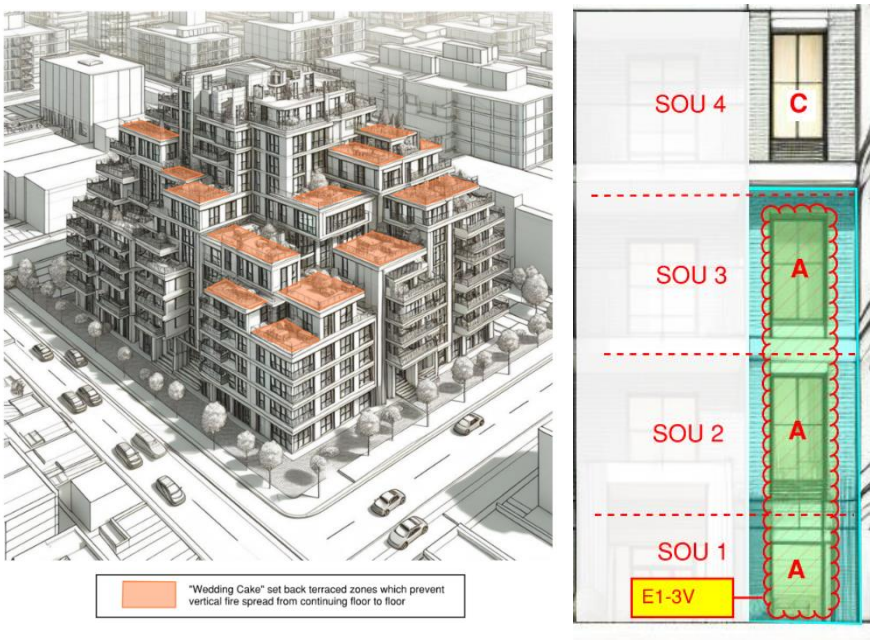


Figure 17: A setback 'Wedding Cake' configuration (left) and an example of a relevant cluster configuration (right). The cluster shown on the right is an example of where a set-back concession would not be applicable as there is no horizontal displacement between the facades of the type "A" SOUs and the type "C" SOU. The image on the left however shows the displacements that would be applicable to apply this concession.

5.2.5 Rooms with multiple openings to a cluster

Where a room is found to be impacted via multiple clusters, or has multiple openings to a single cluster, the FDAS solutions may prescribe a single of each of the primarily required detection devices, rather than multiple, so long as it proportionately treats the risk of the room. Where this is applied, the device is required to positioned at the midpoint of openings, so that each opening is equally treated.

5.2.6 Rooms with existing detection

If a room is found to have the prescribed detection already installed, it is not required to be moved to meet PMCR positioning requirements. This can only be applied where the original positioning is effective in performing the intent of the PMCR solution.

5.3 Recommendations

5.3.1 Type F clusters at a rise in stories of greater than four

Where a "Type F" cluster is found at a rise in stories of five or more, it should be included in the Remediation Work Proposal that CSV recommends sprinkler installation to the SOUs of that cluster. Included in sprinkler installation is balcony sprinkler extensions.

5.3.2 Sprinkler Installation to egress pathways from SOU that are in a cluster.

Where sprinklers are used as an intervention to a cluster, it should be recommended that the sprinklers also be extended to the egress pathways that are used by occupants of the cluster, including common area corridors as piping infrastructure will already be required to be extended.

5.4 Interconnectivity and transmission pathways

5.4.1 Smoke detection

Smoke detection or components with smoke detection installed to a SOU must:

(a) Be configured so that detection of smoke only triggers local SOU alarm; and

(b) Where there is more than one smoke detection device, they all must be interconnected within that SOU.

5.4.2 Thermal detection

Thermal detection or components with thermal detection must be configured so that thermal detection activation triggers the building occupant warning system (BOWS).

(This excludes FPAA101D sprinkler systems. Separate heat detection is required where FPAA101D systems are installed.)

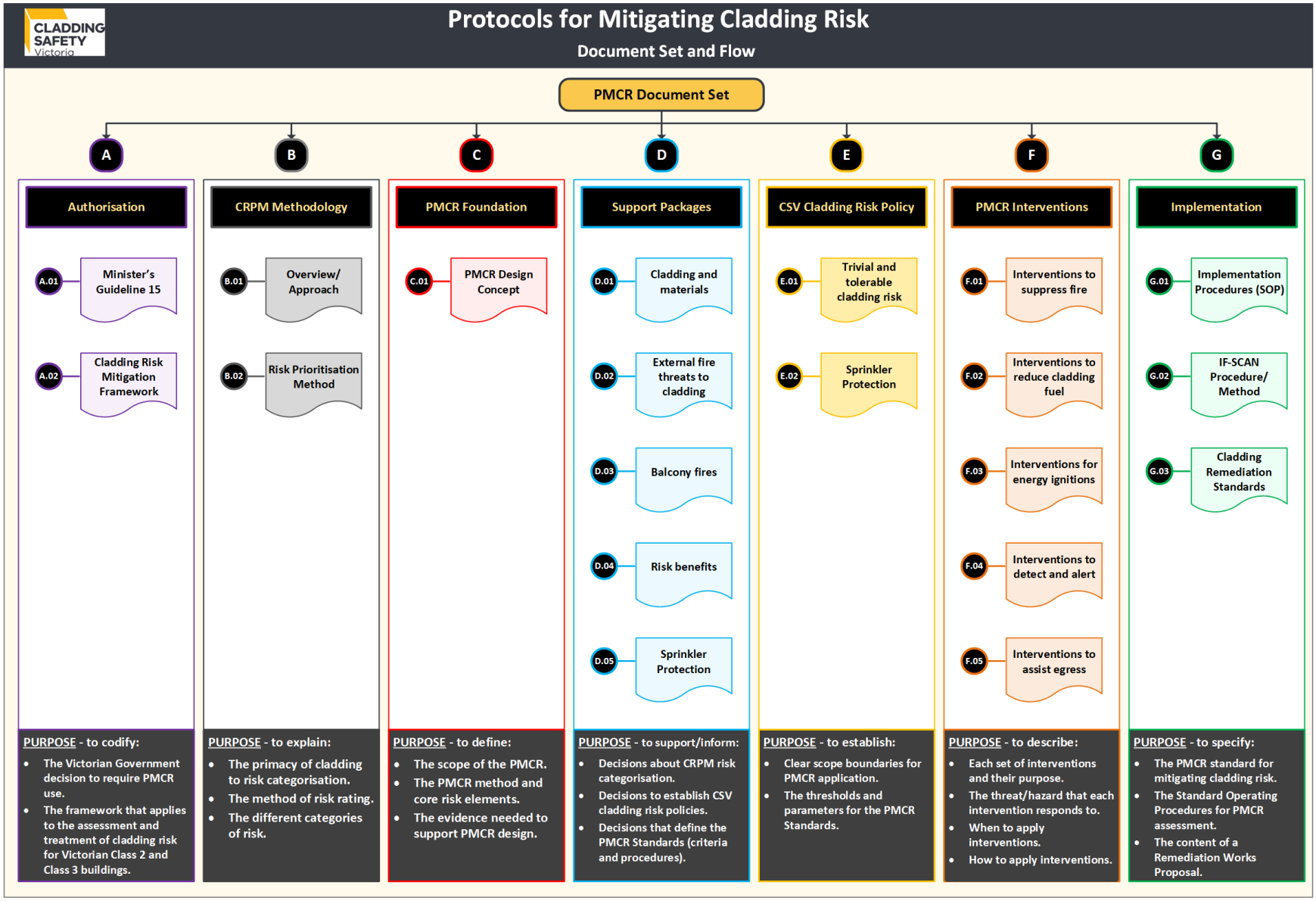
5.4.3 Multi-criteria detection

The combined components (smoke and thermal) must satisfy their respective detection interconnectivity and transmission pathway requirements as stated in:

(a) 6.4.1 for smoke detection; and

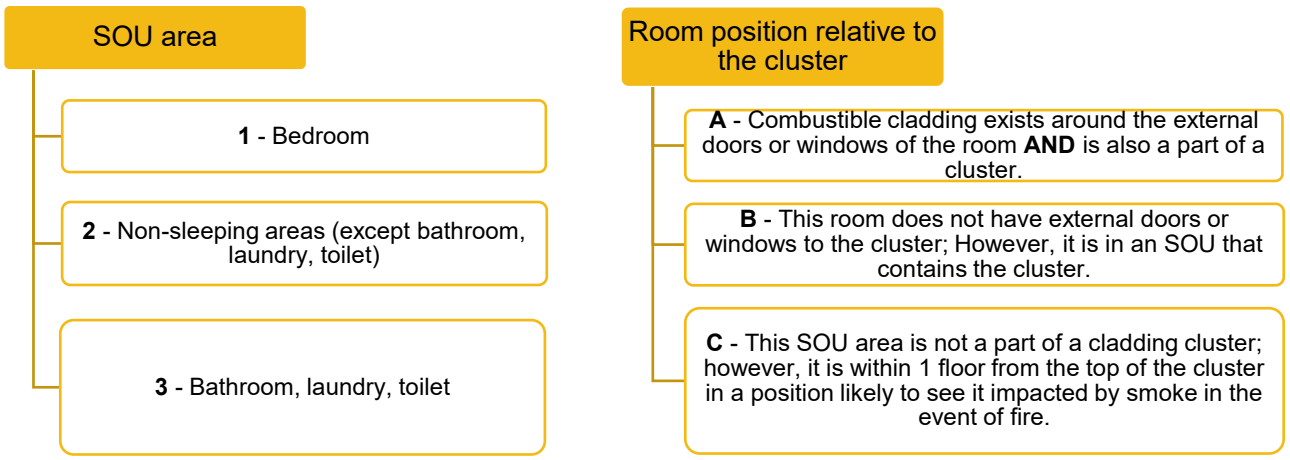
(b) 6.4.2 for thermal detection.

Appendix A: PMCR document set and flow



Appendix B: SOU codification

A brief description of this codification can be seen below, with visual aid and examples also shown.



Note: where rooms are isolatable (with a door), and it is feasible to be considered a sleeping area (studies, repurposed bedrooms) CSV's worst case risk approach will treat these areas as bedrooms.

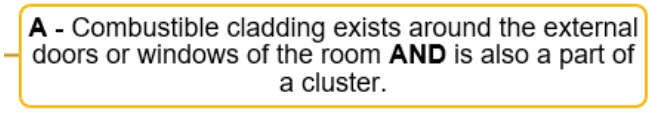
"A" Types

Type "A" configurations represent the worst-case risk in the PMCR. These are areas that have combustible cladding that exists around the external doors and windows of the room and is also a part of a cluster. Depending on the cluster assessment, and the inherent risk posed to occupant safety through a plausible cluster fire, various levels of detection are required.

Intention:

There are three main intentions for type "A" areas depending on room type (1, 2, 3). Firstly, bedrooms that are identified as A's (1A), require smoke detection to the impacted openings. Secondly, type 1&2 (1A & 2A) rooms may require heat/thermal detection where it is plausible that flashover may occur and subsequently impact an above SOU(s). Finally, type 3 areas (3A) require a form of detection that minimises the risk to SOU occupants through notification of fire before fire or smoke obstructs the path to the SOU exit in such a way as to make it untenable.

Type "A" rooms are defined as:



In the below example, the blue sections represent combustible cladding. The rooms that interface the combustible cladding may become type "A's" depending on how the cluster comes to be formed.

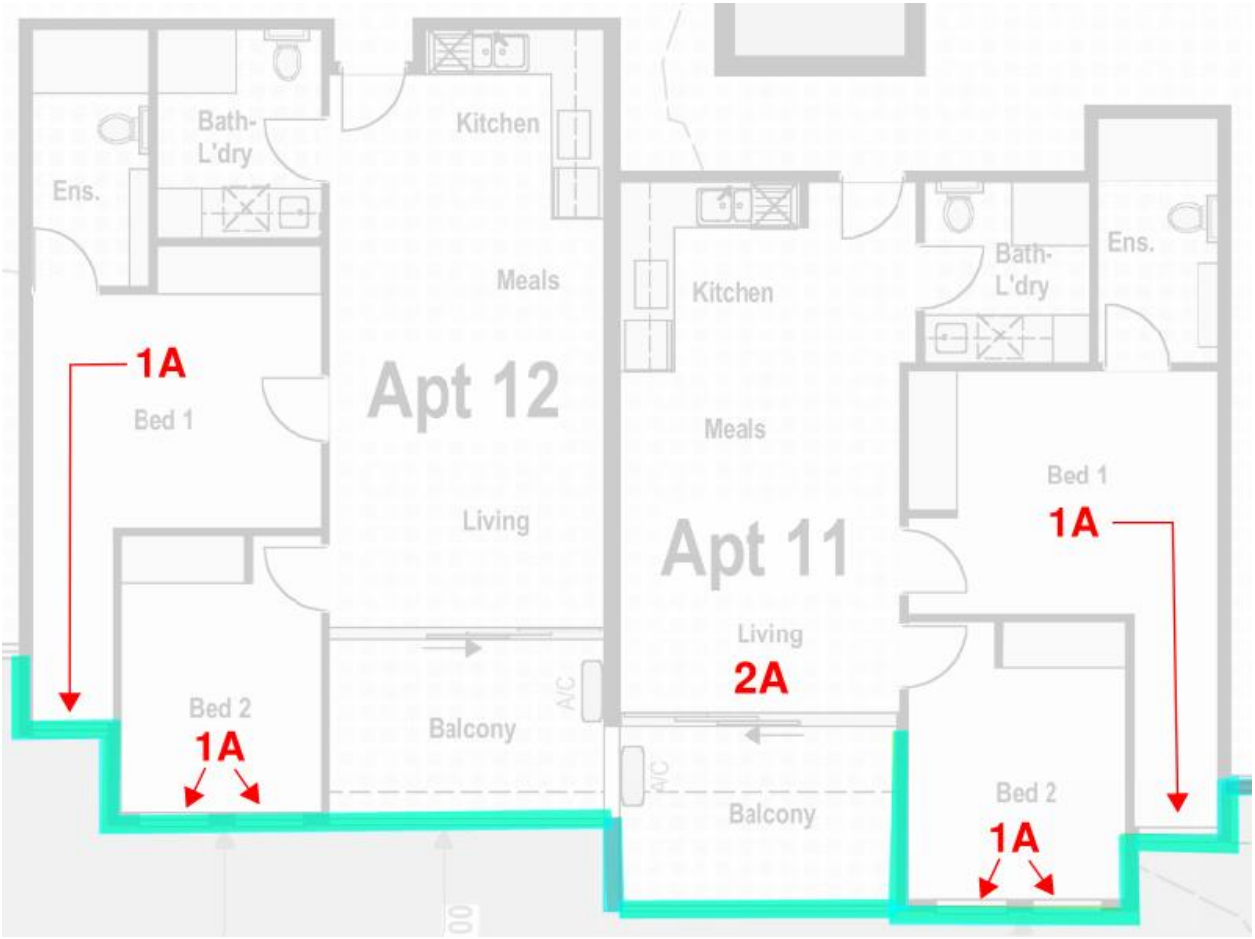


Figure 18: Potential "A" type rooms of a cluster, these have doors or windows that sit directly on combustible cladding but are not yet also a part of a cluster

Example:

Step 1: Regarding the bedrooms in Figure 18 each have external doors or windows connected to combustible cladding but are not yet given a SOU codification as they currently only meet the first condition towards becoming a type “A”, as per Page 42 of this document.

Step 2: Identify where the clusters exist along the facade. In Figure 19, the same floorplate has been used to illustrate how the “change” in the location of the clusters dictates the SOU codification.

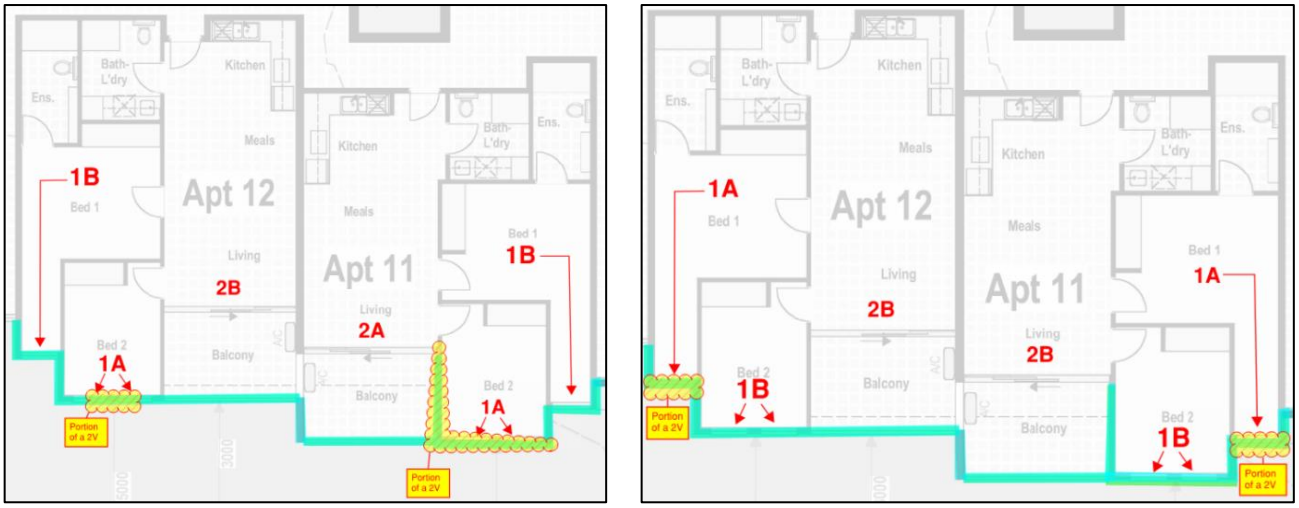


Figure 19: The cluster markup is the second condition to assigning type "A" rooms

“B” Types

Type “B” rooms are defined as:

> **B** - This room does not have external doors or windows to the cluster; however, it is in an SOU that contains the cluster.

This is all areas of a SOU (that is a part of the cluster) that do not have openings to a cluster. If a SOU has a type “A” then every other room that is not also a type “A” becomes a type “B” room. Figure 20 also shows that type “B” rooms may have combustible cladding located on the facade, but if this has not been identified as part of a cluster, then it is defined as a type “B” room.

Intention:

The principal intention of intervening upon type “B” rooms is to provide smoke detection to a SOU common area(s) so that occupants of bedrooms are given necessary time to evacuate their SOU.

Example:

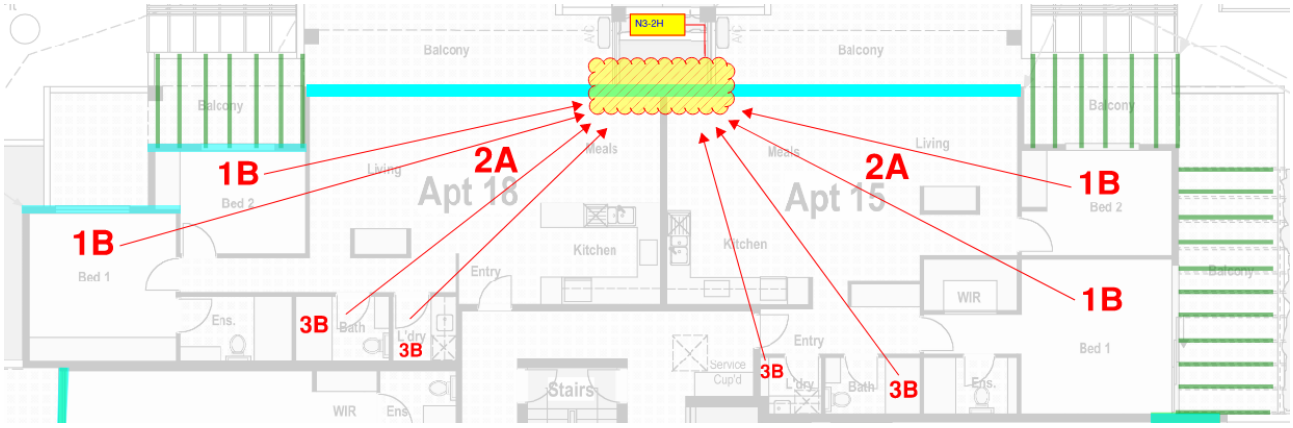


Figure 20: B type rooms of a cluster. The distance from the cluster can be seen here even though cladding (represented in blue) resides on the facades of bedroom in apartment 18.

“C” Types

Type “C” are rooms of a SOU that do not belong to a cluster, however due to cluster/SOU configuration, they are at risk of being significantly impacted by smoke ingress from the below cluster.

Type “C” rooms are defined as:

> **C** - This SOU area is not a part of a cladding cluster; however, it is within 1 floor from the top of the cluster in a position likely to see it impacted by smoke in the event of fire

Therefore, smoke detection is required to type “A” bedrooms, since these spaces house sleeping occupants.

Intention:

Protect type “C” bedrooms from smoke ingress – via smoke detection to the openings of these rooms.

Example:

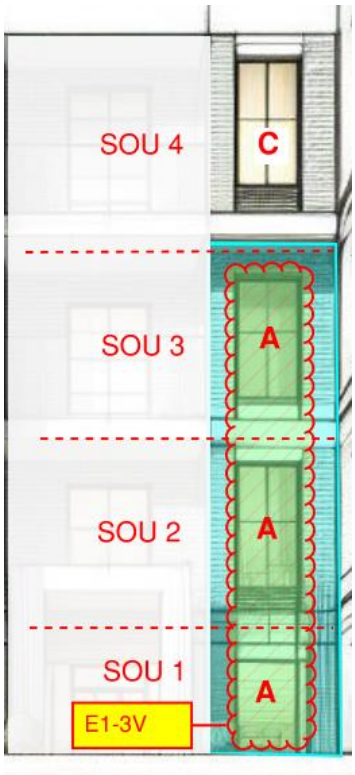


Figure 21: “Type C” above “Type A” - 3V cluster

In the example above (Type *"C” above type “A”- 3V cluster*), there is no horizontal displacement between SOU facades (the facade is on the same plane), and thus smoke ingress in foreseeable. Therefore, an invention of Smoke Detection to SOU 4 is required.

In contrast, if for example SOU 4 was set back (in a “wedding cake” formation) by more than 1.5m, smoke ingress would not be likely, and it would not be codified as a type “C”.