Protocols to Mitigate Cladding Risk

PMCR Interventions

F.05 – Intervention to Assist Egress

Interventions are required to mitigate the risk to life safety posed by the presence of combustible cladding on the facades on Class 2 and Class 3 Victorian buildings.

The Victorian Government has developed a method for:

- assessing the risk presented by combustible cladding; and
- introducing targeted interventions to bring buildings to an acceptable level of cladding risk.

The **15** related risk mitigation interventions that may be applied fall into **five** categories:

1. Interventions to suppress fires;
2. Interventions to reduce cladding fuel;
3. Interventions to detect fire and alert people;
4. Interventions to address energy ignitions; and
5. **Intervention to assist safe egress from a building**.

This document provides information about those **interventions designed to assist safe egress from a building**.

It is designed to assist those assessing a building's cladding risk and deciding how to intervene to reduce cladding risk to an acceptable level.

Version 2
Date: 13 March 2024

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 (being multi-storey residential structures).

For 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.

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 additional information.*

There are **seven** related streams of technical document 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 current document is one of a suite of PMCR Intervention Reports that describe how and when targeted risk mitigation interventions are applied to make building occupants safer.

Abbreviations

Term	Meaning
ACP-PE	Aluminium Composite Panel with a polyethylene core
ASE	Alarm Signalling Equipment
BOWS	Building Occupant Warning System
CRMF	Cladding Risk Mitigation Framework
CSV	Cladding Safety Victoria
EPS	Expanded Polystyrene
FDCIE	Fire Detection Control and Indicating Equipment
FRV	Fire Rescue Victoria, formerly known as the Metropolitan Fire Brigade (MFB)
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
RWP	Remediation Work Proposal
SOU	Sole Occupancy Unit - as defined in the National Construction Code

1 Introduction

When a building has combustible cladding on the facade, an **intervention** may be necessary 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 from building to building. Accordingly, a decision to **intervene** and the extent of **intervention** required must 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 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; and
- inform owners about how their building is assessed with regard to cladding risk and the structured way in which Remediation Work Proposals are developed to bring their building to an acceptable level of cladding risk.

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 a Remediation Work Proposal (**RWP**), that applies the cladding risk methodologies developed by CSV over three years.

A 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.

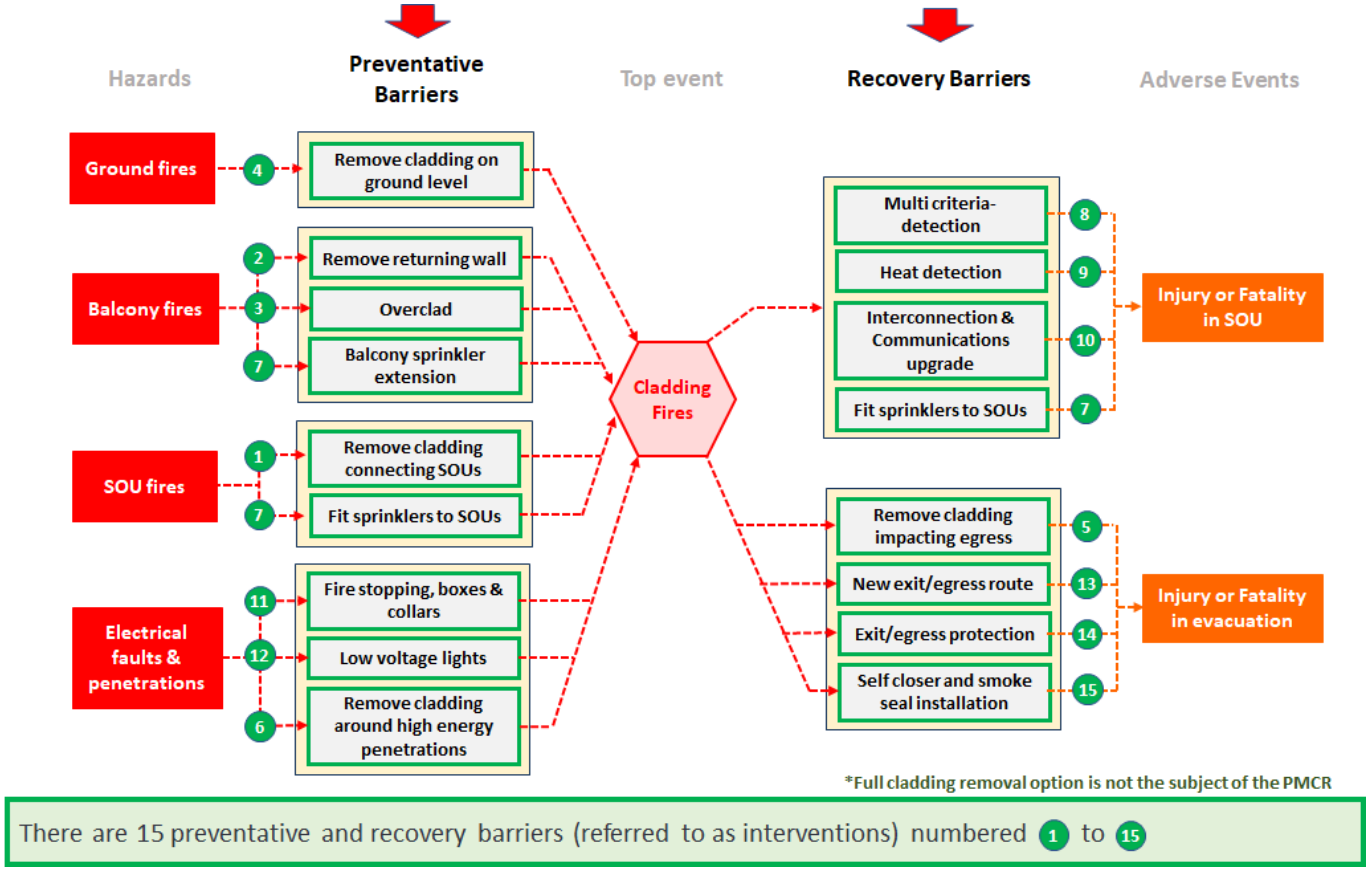


Figure 1: Threat barrier analysis

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 of this report

This report provides information about interventions that have been developed to reduce the cladding risk on Victorian multi-dwelling residential buildings (Class 2 and Class 3) to an acceptable level.

The 15 interventions function to reduce cladding risk in one of five discernible ways.

The documentation developed by CSV to support the implementation of the Victorian Government's Framework, includes information to guide MBSs and owners in determining how and when to apply particular interventions.

The information is packaged in five related volumes, one for each category of interventions, as represented in the diagram on the right.

In selecting particular interventions, it is important to understand:

- The ignition hazards that an intervention is responding to;
- The benefit to safety of applying an intervention;
- When an intervention is required to be applied; and
- Any considerations that must be made to guide the selection and installation of an intervention.

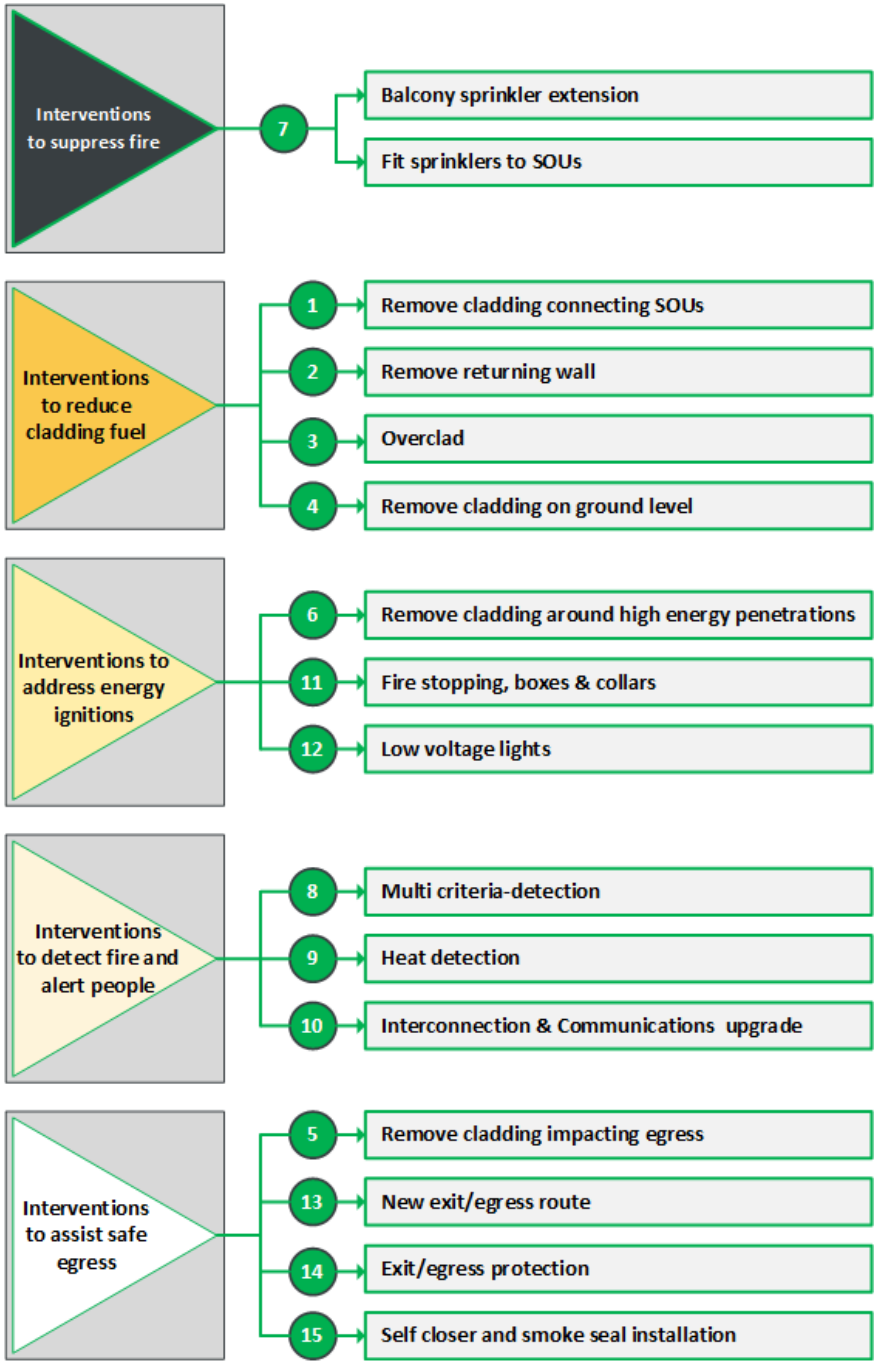


Figure 2: Thematic set of interventions

This document addresses those interventions that assist in safe egress.

2 Scope of interventions

The **objective** of intervening to mitigate cladding risk under the Framework is to bring each building to a state of Acceptable Cladding Risk.

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 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 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.

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 response to be considered. These types of intervention responses are represented diagrammatically below.

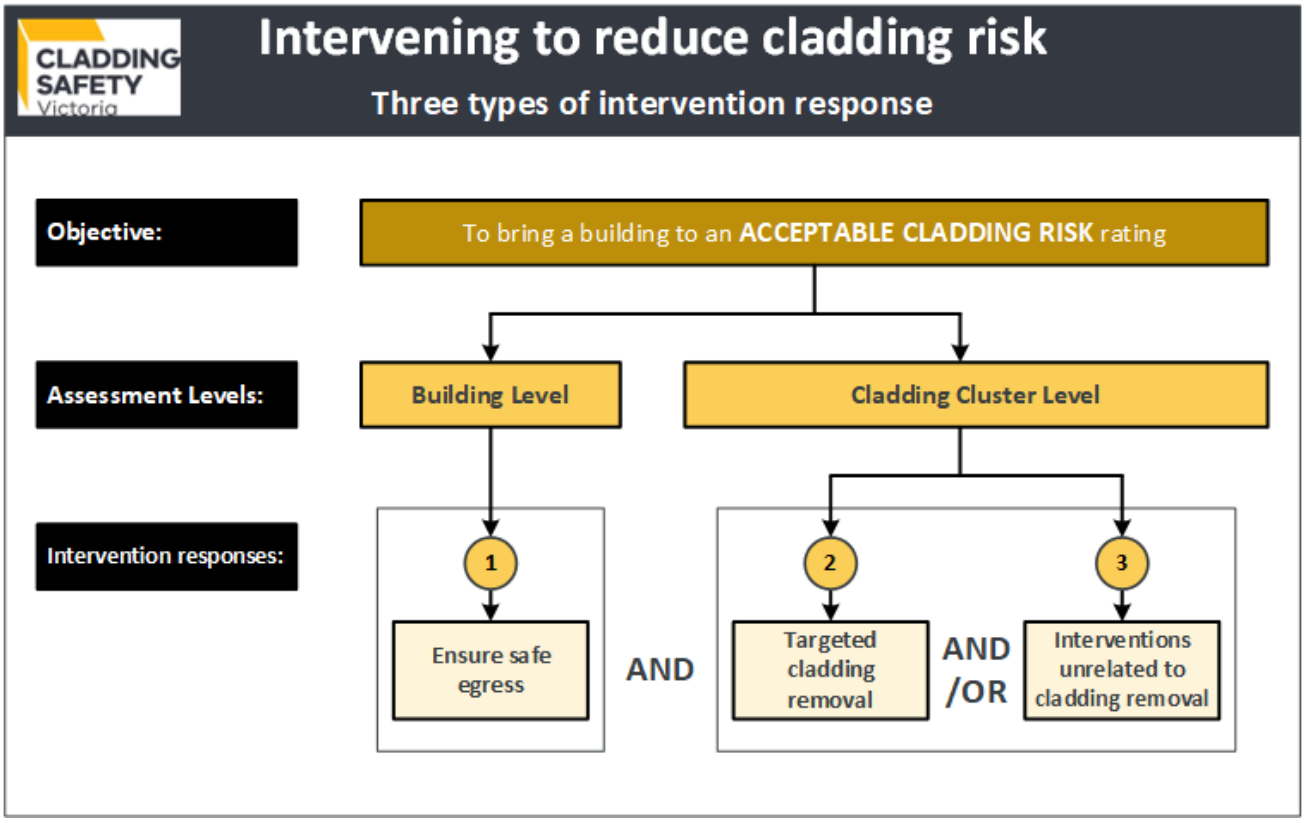


Figure 3: Types of intervention responses

This report focuses on interventions 5, 13, 14 and 15 to assist safe egress.

3 Interventions to assist safe egress from a building

3.1 What are the interventions?

The availability and maintenance of safe egress paths during a fire emergency is a fundamental objective of the regulatory requirements for all buildings.

Buildings with combustible cladding in proximity to exits or egress paths may require the combustible cladding to be removed or minimised to maintain safe egress for building occupants.

It may be possible however, to apply a selection of prevention or recovery barriers to mitigate the risks associated with combustible cladding. These barriers are collectively referred to as interventions.

Used singularly or in combination, interventions can be used to mitigate the risk of combustible cladding in proximity to exits, paths of travel to exits or the travel path from an exit to the street.

Egress interventions in the PMCR are divided into four categories as described below in Figure 4.

Figure 4: Interventions to assist safe egress

3.2 Assessing combustible cladding impact on safe egress

When assessing the impact of combustible cladding in proximity to an egress path, a number of considerations are necessary. A Logic Tree stepped process to consider the potential impact of combustible cladding in proximity to an exit or egress path is provided in Appendix B. It includes the following considerations:

- A cladding's combustibility, its volume and its proximity to an exit path are factors that can influence the impact that combustible cladding will potentially impose upon an occupant's safe egress from a building.
- If impacted by fire, combustible cladding or lining in proximity to egress paths, could pose a risk to safe egress through radiant heat impacting upon an occupant using the exit path or in the form of falling debris. In buildings where height and access allow for the fire brigade undertaking external suppression it is assumed the arrival of the fire brigade and commencement of interventions will reasonably occur before falling debris becomes a credible risk to occupant egress.
- Simultaneous fire scenarios in different locations within a building are not considered a likely scenario. As such, in a building with two or more designated exit options, a fire at either of the exits does not compromise safe egress irrespective of the cladding in proximity to the exits.
- CSV's assessment of several thousand buildings in Victoria, indicates that the majority of Class 2 and Class 3 buildings have been constructed with an alternative egress path for occupants. In some cases, the alternative egress path is provided via the basement level.
- The occupants of Class 2 and Class 3 buildings regularly access car parking areas, garbage bin rooms, bike and general storage enclosures. They are, as a consequence, generally familiar with their building configuration and the available egress paths. In some buildings, the most commonly used path of egress for many residents is an egress path from basement level.

In a Class 2 or Class 3 building that has been constructed with a single exit, any combustible cladding located in proximity to that exit potentially pose a greater risk. Cladding removal may be required unless:

- There is another suitable means to exit the building. In some circumstances a vehicle ramp from a basement car park may potentially be suitable as an alternative exit, noting that further enhancements may be necessary, such as handrails, additional emergency lighting and exit signage, and other provisions as necessary to make the egress path compliant.
- The location and extent of cladding is such that:
  - ✓ attending fire brigade personnel can extinguish the fire soon after their arrival; or
  - ✓ the extent of combustible cladding is trivial in that it does not make the egress path unusable (refer to examples in Appendix C).

An intervention should be considered where it is foreseeable that combustible cladding:

- Exposes evacuating occupants to an unacceptable risk; and
- Significantly compromises the ability of the fire brigade to enter the building to suppress an internal fire.

Where the combustible cladding are considered trivial, they are located away from any ignition sources and/or do not compromise the egress path of travel so as to make it unusable, then it is likely the cladding can be retained (refer to the examples below and further examples in Appendix C).

Figure 5: ACP located to the fascia of the canopies only. Soffits are non-combustible and void of likely ignition sources

Principal exit/entry

The principal exit from a building is typically also the main entry to a building for fire brigade personnel to initiate search and rescue, or to access fire service equipment such as the Fire Detection Control & Indicating Equipment (FDCIE), in the event of an internal building fire.

The Logic Tree (*Appendix B*) steps through an assessment of the impact posed by combustible cladding on the principal exit from a building. In assessing the suitability of the principal exit for occupants seeking egress, an equivalent assessment of access to the building via the principal exit is made.

Combustible cladding used in proximity to an exit or egress path that provides a likely avenue for fire spread internally via openings to an SOU or common area, is considered a linked cladding component.

Where fire spread internally is possible from an external combustible element, the combustible element posing a risk to egress should be removed unless adequate protection is provided (Intervention 14) or an unobstructed alternative option for egress is readily available in close proximity (Intervention 13). Refer to Appendix C for relevant examples.

If combustible cladding does not pose a likely avenue for fire spread to the interior of the building, an isolated fire risk in proximity to the building entry will reasonably be addressed on approach to the building by the fire brigade. Entry into the building would not normally be required to initiate intervention actions to a fire source in front of the main exit or isolated combustible cladding on the building in proximity to the exit.

3.2.1 Intervention 5 – Remove cladding impacting egress

Objective: The removal of combustible cladding in proximity to an exit may be a required intervention where the buildings egress configuration does not provide a safe egress path.

Any combustible cladding that is to be removed, shall be replaced with *non-combustible* cladding as defined in the National Construction Code – Building Code of Australia.

Where combustible cladding is located in proximity to a building exit or egress path, its exposure to a credible ignition source is a fundamental consideration in assessing the likelihood of ignition and the subsequent level of risk the cladding could pose. Removal of the combustible cladding may be required.

Combustible cladding that could potentially provide an avenue for fire spread from ground level to combustible cladding over an exit should always be considered for removal to minimise the risk of that exit being compromised by what would otherwise be considered a benign fire. A benign fire is a small local fire such that may occur because of a dropped cigarette landing in combustible garden mulch or in a corner where combustible debris have collected, or any other small, introduced fuel load.

Combustible cladding extending to ground level where risk of ignition via fire may exist, may provide an avenue for fire spread to cladding over or adjacent to an exit.

Larger fires that have the capacity to compromise an exit, i.e. bin/car fires that are in proximity to an exit, could compromise the exit in their own right or develop into a combustible cladding fire.

Figure 6: The ACP element extending to ground level creates a risk of benign fire ignition resulting in a problematic fire

It is reasonable to consider retention of small elements of combustible cladding where it extends to ground level. Refer to the example below and further examples in Appendix C.

Figure 7: The ACP element extending to ground level is considered trivial and an unlikely risk of fire spread to the element above

Significant ignition risks to combustible cladding over exits such as a motor vehicle, garbage bin or other introduced substantial fuel loads that are of a size to pose a plausible ignition risk, would in themselves be problematic fires and represent a principal obstruction to occupant egress.

It is reasonable to consider the retention of combustible element/s over an exit where their configuration does not pose a likely risk of fire spread via openings to an SOU or common area within the building and the ignition source to which it is exposed is itself a principal obstruction to egress.

Without an avenue for fire spread to the building interior, the attending fire brigade will initiate response interventions to address the external fire from outside the building.

Figure 8: The ACP element on the face of the canopy does not provide an avenue for fire spread to the building's interior. However, the vehicle would be the principal obstruction to egress in the event of its combustion being a source of plausible ignition to the ACP.

Where there is a likely avenue for fire spread to an SOU or common area within a building from combustible cladding over the principal building exit, cladding removal (or another suitable intervention) will be required to enable fire brigade entry to initiate rescue or internal fire intervention activities. Refer to Appendix C for additional examples.

3.2.2 Intervention 13 – New exit/egress route

Objective: The objective of this intervention is to provide an alternative exit or exit path if cladding removal or other intervention options cannot be feasibly implemented.

A fundamental consideration when assessing the impact of combustible cladding on safe egress from a building is whether there are designated alternative exits or egress paths available to occupants. The number of designated exits is a preliminary step in the Logic Tree Assessment – refer to *Appendix B*.

The likelihood of fires simultaneous impacting two different exits from a building is not considered a credible risk in building design in Australia. Where occupants of a building are provided with alternative option for egress, the presence of combustible cladding at one or both of the exits therefore poses a significantly reduced impact on safe egress in the event of fire.

Where a designated alternative exit/egress is provided, it must be compliant with the provisions of the National Construction Code. The separation requirements between alternative exits within the National Construction Code will generally ensure that an alternative exit or egress path will not be compromised by the same combustible cladding element. This must however remain a consideration for assessment of the suitability of an alternative exit.

The existing building design and the costs associated with implementation and configuring an alternative exit in compliance with the provisions of the National Construction Code are significant factors in determining whether creating of a new exit path is a viable intervention option.

When the existing building layout offers a feasible avenue for a new exit path to be created, this intervention may be appropriate for implementation where cladding removal (Intervention 5) or exit protection (Intervention 14) cannot be easily or cost effectively implemented.

Where an alternative exit is considered an appropriate intervention to maintain safe egress, the exit configuration must allow an occupant to identify whether an exit or egress path is compromised before committing to the exit or egressing to a location where access to the alternate exit path is no longer possible.

Glazed exit/entry doors, solid doors with glazed vision panels or exit alcoves incorporating window panels are all configurations that can, depending on the configuration and location of the cladding risk, allow an occupant to assess whether an exit or egress path has been compromised.

3.2.3 Intervention 14 – Exit/egress protection

Objective: The objective of this intervention is to provide a barrier to protect an occupant's exposure where combustible cladding poses a risk of falling debris or radiant heat that may compromise the safe egress of occupants.

Unless a fire originates within close proximity to and quickly impacts a configuration of combustible cladding that poses a risk of falling debris to an exit or egress path, arrival of the fire brigade and commencement of interventions including fire suppression will reasonably occur before falling debris becomes a credible risk to occupant egress. Where a facade and allotment orientation or height does not allow the fire brigade to readily undertake external suppression, additional time for fire brigade intervention shall be considered.

In buildings that incorporate a building design with a floor plan that steps in at higher levels, tiered construction or 'a *wedding caked floor plan*', the likelihood of falling debris being a risk to occupants is significantly reduced.

An occupant's exposure to combustible cladding in proximity to an exit can be effectively mitigated where a non-combustible barrier or shield protects the occupants egress path.

A slab projection or a non-combustible overhead canopy structure will minimise an occupant's exposure to overhead combustible cladding, providing a protective cover for occupants to exit and move away from combustible cladding to which they might otherwise be exposed.

A canopy structure/building overhang that provides a 1.2m wide path of travel, so that building occupants can safely continue their egress beneath it and away from the building (normally along the footpath), is considered to provide an adequate level of protection to an egress path.

Similarly, a canopy structure/building overhang projecting 1.2m from a wall surface comprising combustible cladding is considered to provide an adequate level of protection to an egress path below combustible cladding that are not more than two floor levels above the shielding structure.

The materials used to provide a structure for overhead protection will principally be non-combustible materials and materials of a type that would reasonably be expected to provide protection against falling debris. A canopy structure with a non-combustible roof covering is considered to provide suitable protection. An entry canopy with polycarbonate or similar roof covering would not be considered to provide satisfactory protection against falling debris. Refer to Appendix C for additional examples.

Combustible cladding adjacent to an egress path may expose building users to intolerable radiant heat exposure. This risk could be effectively mitigated by a barrier that will appropriately shield occupants. The height of the barrier intended to mitigate radiant heat exposure from an adjacent combustible element must be not less than 1.5m in height.

A trivial amount of combustible cladding that is located in proximity to an exit can be considered for retention without any further intervention, as the exposure to building occupants is considered a tolerable risk. Refer to *Appendix C* for relevant examples.

3.2.4 Intervention 15 – Self closer and smoke seal installation

Objective: The objective of this intervention is to maintain safe paths of travel to exits within a building, where combustible cladding is considered, in the event of their ignition, to compromise the tenability of exit paths.

Interventions 8, 9 and 10 provide for the installation of improved detection and communication systems within a building. These systems mitigate occupant risk by initiating evacuation through early fire detection and occupant warning.

The use of smoke seals must form an integral consideration for the detection mechanism that activates the Building Occupant Warning System. The installation of smoke seals and self-closing devices to the entry doors of individual SOUs can protect common egress paths from smoke infiltration.

Where the detection system within an SOU is configured to activate the Building Occupant Warning System, the use of smoke seals on SOU entry doors provides improved smoke protection to common corridors without compromising early warning of building occupants.

The installation of smoke seals *(and self-closing devices)* to the entry doors of SOUs will prolong the time it takes for smoke to spread from an internal SOU fire to a common corridor, including an internal SOU fire where a combustible cladding element has contributed to fire spread.

Smoke seals on SOU doors can therefore increase the period of time that a common corridor remains a tenable egress path, potentially increasing the time for occupants to safely exit a building.

Mechanical self-closing devices are required to be installed on SOU entry doors under the provisions of the National Construction Code. In some buildings, an performance solution at design stage has permitted the removal of self-closing devices to SOU doors.

Where such an performance solution has been approved as part of the original building design or where self-closers have not been removed, a self-closing device shall be provided to the door of any SOU impacted by an elevated or unacceptable cladding cluster, irrespective of other interventions that are implemented to lower the cladding risk to the cluster.

Where smoke seals are proposed to be used, they should be medium temperature smoke seals, tested in accordance with AS1530.7-2007.

4 Considerations for implementing egress interventions – highest benefit through prioritisation

To most effectively impact a PMCR solution, interventions to assist safe egress must aim to provide the greatest benefit whilst mitigating negative effects, i.e., implementing the most cost-effective intervention and providing least disruption to occupants.

To achieve this, the most effective egress intervention/s would provide the greatest benefit when it incorporates the following considerations.

- ***Life-Safety Risk Reduction****:* The greatest consideration when implementing egress interventions is to consider the reduction of risk to life-safety, as their primary function is to assist safe egress paths of travel and exit from the building. Where equivalent life-safety benefit will be achieved, the intervention that can be implemented in the shortest timeframe should be prioritised.
- ***Disruption Reduction****:* Consideration should be given to the disruption caused to building occupants during solution implementation. Where equivalent life-safety benefit will be achieved, the solution that imposes the least disruption to residents should be considered the most appropriate.
- ***Cost Reduction****:* Where equivalent life-safety benefit will be achieved, where the cost *(and quality)* of one intervention is more cost effective than another suitable intervention, then the intervention that imposes least financial imposition should be selected.

The order of these benefits implies that the primary concern during rectification solution design should be of life safety. Disruption to occupants and cost are always secondary to any life safety concerns.

5 Assessing egress and determining an applicable intervention

The following provides examples of the interventions that can be implemented to assist with the safe egress from building.

5.1 Scenario 1 – Exit with ACP and EPS cladding

Figure 9: ACP and EPS along the wall at the main entrance of the building

The building's primary exit recess incorporates an alcove that includes ACP-PE and EPS cladding. It is the only designated exit/entrance for the building.

This scenario will be assessed using the Logic Tree (refer to *Appendix B*).

This is the primary exit for the building and there is a small ACP element above the exit. The ACP element over the exit is trivial being only on the face of the canopy.

The cladding above the exit is linked to ground level by EPS panelling on the left side of the exit. This element is not considered trivial and is considered to be a potential ignition risk as a benign fire source could become problematic due to the composition of cladding around the exit.

It is recommended in this scenario that the ignition risk of the cladding above the exit be mitigated by the removal of combustible cladding that is accessible at ground level on the left side of the exit to at least 1st floor level.

Remediation proposal: Removal of the combustible cladding components located at ground floor level where plausible risk of ignition and internal fire spread exist.

5.2 Scenario 2 – Sole exit with EPS cladding

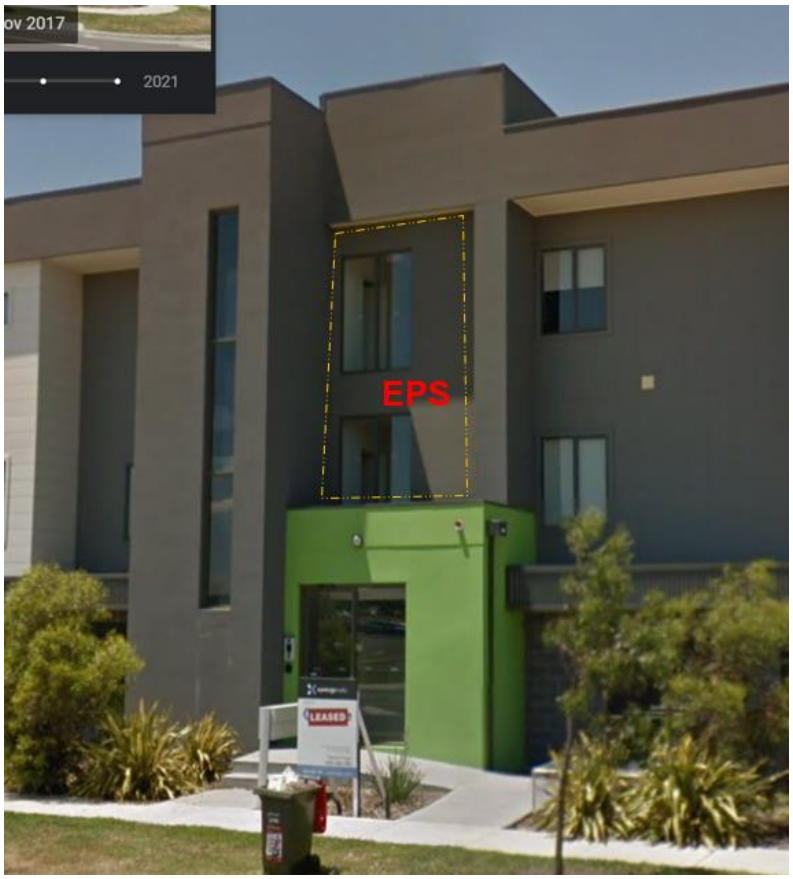


Figure 10: EPS external wall as part of and (set back) above the exit

The building entry extends out from the face of the external wall on the level above. EPS cladding has been used as the external wall cladding above the entry alcove on levels 1 and 2. SOUs above the exit are not sprinkler protected.

This scenario will be assessed using the Logic Tree (refer to *Appendix B*).

This is the primary exit of the building and combustible cladding has been identified above the exit. The exit door is stepped forward 1.2m from the EPS cladding on the wall above. This configuration provides protection for occupants from the EPS cladding above the exit. Access is similarly maintained to the main exit for fire brigade access.

(There is also no combustible cladding around the exit itself and the geometry of the exit provides protection from the EPS above. This exit is considered to provide safe egress for occupants).

No further action is *required* following the Logic Tree assessment. The risk to occupants is mitigated by the structure and configuration of the exit.

Remediation proposal: The risk posed by the EPS cladding in this scenario is not considered to be detrimental to the life or safety of the building occupants – no remedial actions are required.

5.3 Scenario 3 - Limited amounts of ACP combustible cladding

Figure 11: ACP cladding at the balcony balustrade of the building

Aluminium Composite Panels (ACP) have been used to line the outside face of the balcony balustrading directly above the main entrance/exit of the building. The lining on the balcony side of the balustrading is non-combustible.

This scenario will be assessed using the Logic Tree (refer to *Appendix B*).

This is the primary exit from the building and combustible ACP has been identified above the exit. The cladding is not considered trivial. The balcony area that extends over the exit is not considered to provide protection from the cladding above as the occupants' path of travel is directly under the cladding.

The internal face of the balcony area is confirmed to be non-combustible. The combustible cladding does not extend or connect to the SOU or SOU balcony ignition risks or ground level. There are no likely ignition sources identified for the cladding.

The geometry of the exit is not considered to provide safe egress for occupants on account of the volume of ACP above the exit. However, occupants seeking egress can view the exit from the interior of the building to confirm if the exit is safe for use.

There is no sprinkler protection to the exit, but there are no likely ignition sources to the cladding element from ground level.

Remediation proposal: The ACP cladding can be retained without compromising the safety of the occupants. As such, no remedial actions are required.

5.4 Scenario 4 – Large amounts of ACP cladding around exit

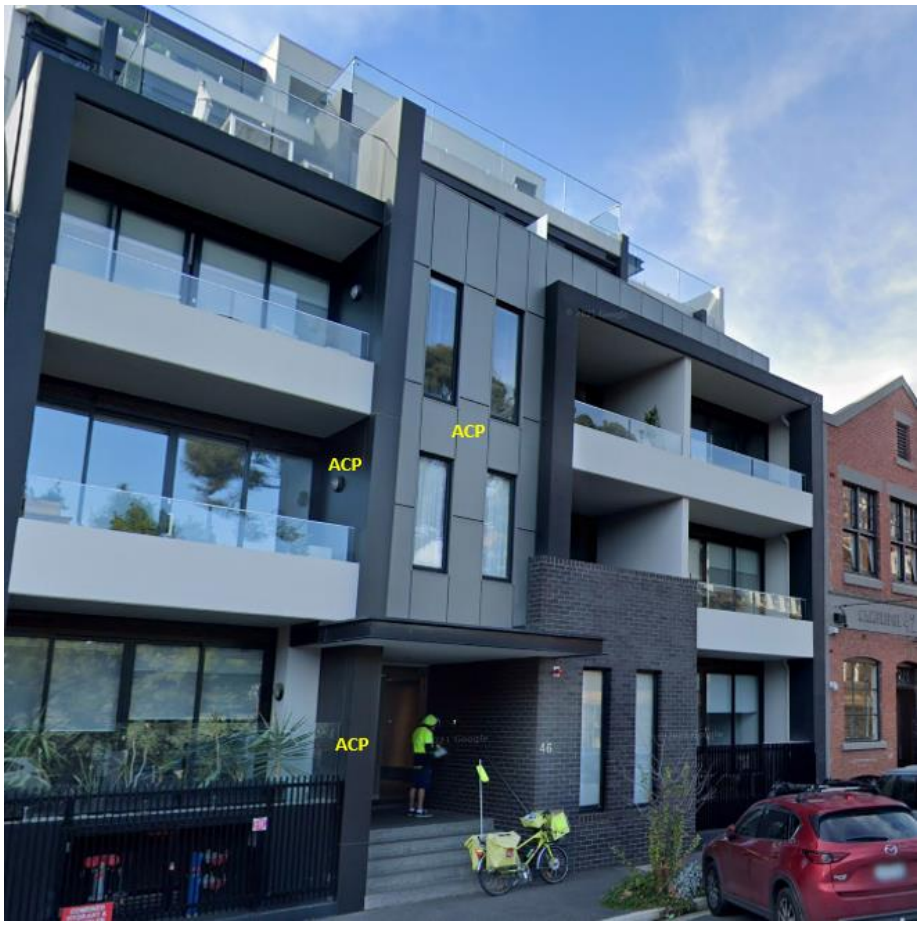


Figure 12: Large amounts of ACP around exit area

This is the only designated exit for the building. Aluminium Composite Panels (ACP) have been used to line the outside face of the building's facade directly over the exit. The canopy does not extend 1.2m from the face of the ACP above the exit. The building is internally sprinkler protected. A column of ACP on the left of the exit appears to extend from ground level past the 1st and 2nd floor of the building and is linked to SOUs at each level as well as the cladding directly above the exit. A canopy at the entry does not suitably separates the ACP on the column (left of the exit) from the ACP cladding above the canopy.

This scenario will be assessed using the Logic Tree (refer to *Appendix B*).

Cladding has been identified above the exit. The canopy projection is less than 1.2m and does not provide occupants suitable protection from the cladding on the external wall of level 1 and 2 in the event of ignition. The combustible cladding above the exit is exposed to ignition risks from the balconies to the left and from ground level by a benign fire due the ACP cladding at ground level.

The exit is wide enough to allow for the cladding at ground level to remain. However, as this cladding poses a risk to the ACP above, it must be removed.

Remediation proposal: Combustible cladding exposed to balcony and ground ignition risks needs to be removed mitigating these ignition risks for the cladding above the exit. The removal of the dark grey elements above the canopy exposed to the balcony ignition risk results in satisfactory separation between the ACP column element below the canopy and the retained element above. ACP above the canopy would not be exposed to a likely ignition risk and the ACP element on the column at ground level could remain as the exit configuration has sufficient width to permit safe egress via the other side of the exit.

5.5 Scenario 5 – Large amounts of ACP cladding around exit

Figure 13: Large amounts of ACP around exit area

This is the only designated exit for the building. Aluminium Composite Panels (ACP) have been used to line a canopy directly above the exit as well as vertical panels that link the ground level to the canopy above; SOUs are sprinkler protected.

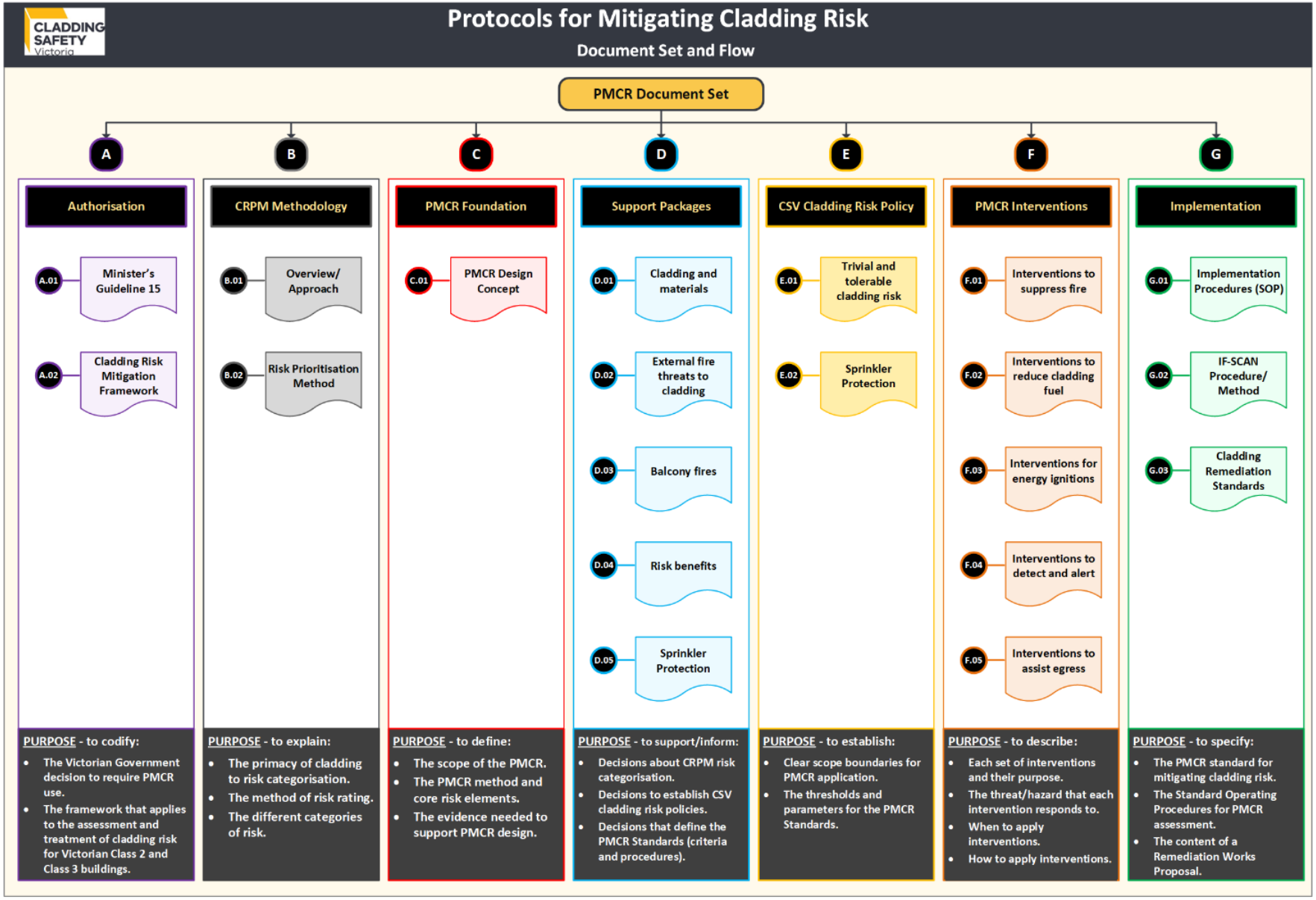
This scenario will be assessed using the Logic Tree (refer to *Appendix B*).

Combustible cladding has been identified over the exit. In this instance the ACP cladding lines the fascia and soffit of the canopy. The vertical ACP cladding on the column on the left side of the exit links the cladding above the exit to ground level. It poses a path of travel for fire from a benign fire to the substantial cladding element over the exit. As the geometry of the building does not provide adequate protection from the cladding above and there is no sprinkler protection to the exit, remedial actions are recommended in this scenario.

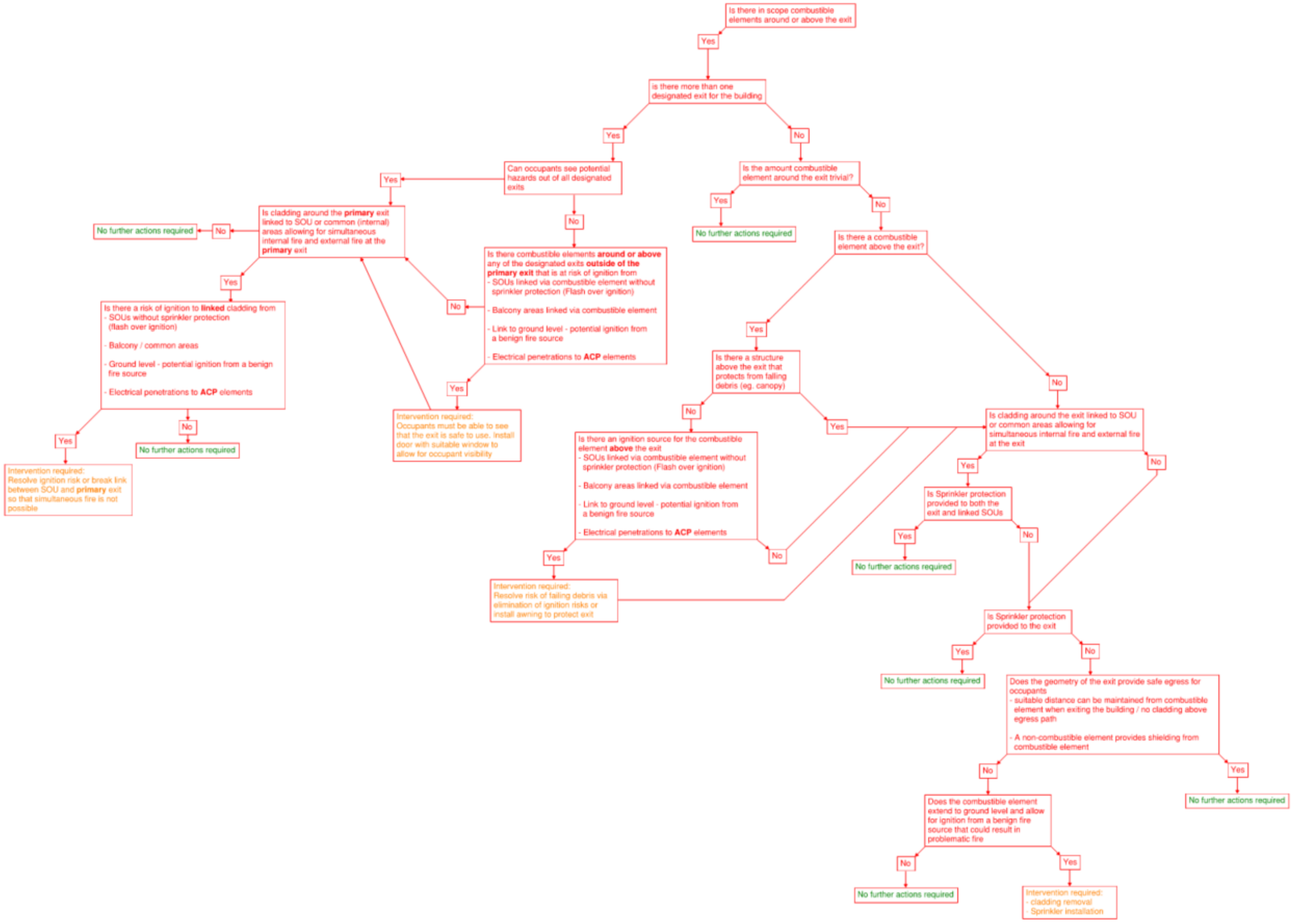
Remediation proposal: Removal of the ACP cladding that connects to the ground and potentially allow for the canopy above to be compromised by a benign fire source.

Appendices

Appendix A – PMCR document set and flow



Appendix B – Logic Tree



Appendix C – Example Exit Assessments (buildings with single exits)

Image reference and link	Is there in-scope material around or above the exit?	Can the combustible cladding be considered trivial?	Is there combustible cladding above the exit?	Is there a structure above the exit that will protect occupants?	Is there an ignition source for combustible cladding above the exit?	Is the exit cladding linked to SOU / other common (internal) area?	Is there sprinkler protection to a linked SOU / other common (internal) area?	Is there sprinkler protection to the exit?	Does the geometry of the exit provide safe egress for occupants?	Does combustible element extend to ground level allowing for benign fire ignition?	Are remedial actions required?
Figure 14	ACP: Cladding to canopy fascia panels	N/A	Yes: On the canopy fascia panels	Yes	N/A	No: Brick work to both sides of the exit	No: No linked SOUs	No: No sprinkler present	Yes: Sofit panels are not combustible	No: Cladding is above ground level	No: Remedial actions not required as there is no ignition source and geometry of the exit protects occupants
Figure 15	ACP: Cladding to spandrels panels to the left of the exit on both level one and two – building is not sprinkler protected	No	No: Cladding is to the left and not above the exit directly	N/A	N/A	N/A	N/A	No	Yes	No	No: Exit is not affected by cladding above and to the left – No ignition source to cladding
Figure 16	ACP: Cladding to fascia panels on canopy	N/A	Yes	Yes: Soffit panels are considered non-combustible	N/A	No	N/A	No	Yes	No	No: Remedial actions are not required, cladding is not at risk of ignition
Figure 17	ACP: ACP cladding to fascia panels, no sprinkler protection to SOUs or Exit	N/A	Yes	Yes	Yes: The SOU next to the canopy is a flashover risk	Yes: The bottom left corner of the canopy is connected with an SOU	No	No	Yes: Sofit panels are not an in-scope material	No	Yes: Remedial actions are required, address risk of ignition from linked SOU
Figure 18	ACP: Cladding to canopy fascia and soffit panels – sprinkler protection to SOUs and exit	N/A	Yes	Yes	N/A	No	N/A	No	No	No	No: Remedial actions not required. No ignition source for cladding over exit and sprinkler protection to exit
Figure 19	ACP: Cladding to canopy fascia and soffit panels. ACP column connects canopy element to ground level – No sprinkler	No	Yes: Canopy element	Yes: A canopy protects from above	N/A	No: No cladding linked to SOUs	No	No	No: Occupants must travel directly under an in-scope material	Yes: Cladding comes to ground level and presents an ignition risk to canopy cladding above the exit	Yes: Remedial actions required – removal of cladding link between ground and canopy
Figure 20	ACP Cladding to canopy above exit (fascia and soffit panels)	No	Yes: Canopy element	Yes: The canopy protects from above	N/A	No: Cladding is not linked to SOUs	No: No linked cladding, sprinkler protection to SOUs is in place	No	No: Soffit panels are ACP	No: No link to cladding from ground	No: No risk of ignition to cladding above the exit

Image reference and link	Is there in-scope material around or above the exit?	Can the combustible cladding be considered trivial?	Is there combustible cladding above the exit?	Is there a structure above the exit that will protect occupants?	Is there an ignition source for combustible cladding above the exit?	Is the exit cladding linked to SOU / other common (internal) area?	Is there sprinkler protection to a linked SOU / other common (internal) area?	Is there sprinkler protection to the exit?	Does the geometry of the exit provide safe egress for occupants?	Does combustible element extend to ground level allowing for benign fire ignition?	Are remedial actions required?
Figure 21	ACP: Cladding to awning above primary exit – sofit and fascia panels in scope	No	Yes	Yes	No	No	No	No	No	No	No remedial actions are required
Figure 22	ACP: Cladding to fascia and soffit panels	No	Yes: Lining to canopy fascia and soffit	Yes: There is a canopy above the exit	No: No cladding above	No: No link to SOUs	No	No	No: Canopy soffit lined with ACP	No	No: A problematic ignition risk to the cladding (e.g. a car fire) would itself obstruct egress. No cladding link to internal areas.
Figure 23	ACP: ACP over exit door	Yes: Minimal cladding in proximity to exit	Yes: At head of door	Yes	No	No	Yes	No	Yes	No	No: Cladding amount is trivial
Figure 24	ACP: Cladding used to box out beams in proximity to exit Cladding used for small canopy feature over exit Cladding used to either side of exit	No	Yes: Boxed out structural member clad in ACP	No: Not that suitably protects from the cladding above	No: No linked SOU that could result in simultaneous fire at exit and linked SOU	No	No	No	No	No	No: No remedial actions required as cladding around exit is not at risk of ignition from a benign fire source and there is no link to SOUs
Figure 25	ACP: ACP above and to the left of the exit	No: Too much cladding	Yes: ACP cladding above	Yes: Canopy provides protection from cladding above	Yes: However, existence of canopy over the exit mitigates the cladding ignition risk above	No: Fire break exists between ground level cladding	No	No	Yes: Cladding can be avoided. Canopy provides protection from above and ACP cladding is only to one side of the exit.	Yes: Ground level ignition risk. Cladding to the left of the exit connects to the ground.	No: Remedial actions not required; geometry of building protects the occupants
Figure 26	EPS: EPS panels to either side of the exit at ground level	No	No	Yes	No	No	No	No	Yes: Cladding is to one side of the exit – fire large enough to affect both panels of EPS would be considered problematic	Yes: Cladding connects to ground level. A benign fire source could become problematic	No: Geometry of the exit allows for safe exit for occupants in the event that a benign fire affects one side of the exit

Image reference and link	Is there in-scope material around or above the exit?	Can the combustible cladding be considered trivial?	Is there combustible cladding above the exit?	Is there a structure above the exit that will protect occupants?	Is there an ignition source for combustible cladding above the exit?	Is the exit cladding linked to SOU / other common (internal) area?	Is there sprinkler protection to a linked SOU / other common (internal) area?	Is there sprinkler protection to the exit?	Does the geometry of the exit provide safe egress for occupants?	Does combustible element extend to ground level allowing for benign fire ignition?	Are remedial actions required?
Figure 27	ACP: ACP service covers to the left of the exit	No	No	Yes	No	No	No	No	Yes: Cladding is only to one side of (left) a wide exit/entry alcove	Yes: Cladding connects to ground level. A benign fire source could become problematic	No: Geometry of the exit allows for safe exit for occupants in the event that a benign fire affects one side of the exit
Figure 28	EPS: EPS cladding to fascia panels on canopy	Yes	Yes: EPS to SOU above	Yes: Balcony area acts as canopy/provides protection to exit from above	Yes: Balcony area accessible by residents	Yes: To the right of the exit is a SOU linked via EPS cladding	Yes	No	No: Cladding to the right of the exit is in direct line of travel	Yes: Cladding is connected to ground. A benign fire source could become problematic.	Yes: Ground ignition possible – cladding removal recommend
Figure 29	EPS	No	Yes	Yes	No: No combustible element above the exit	No	No	No	No: Sofit panels are not wide enough to provide safe egress	No: Cladding does not connect to the ground – a benign fire source would not affect the exit	No: Cladding is not at risk of ignition from a benign fire source
Figure 30	EPS/ACP: EPS cladding above exit and ACP to the face of the canopy – sprinkler protection to SOUs	No	Yes	Yes: Exit is set back. Canopy provides egress protection to occupants.	Yes: Balcony areas – mitigate sprinklers to SOUs	Yes	Yes	No	No	Yes: Cladding is connected to ground. A benign fire source could become problematic.	Yes: Remove cladding – break link between exit and SOUs above to mitigate risk of simultaneous fire at exit and linked SOUs
Figure 31	EPS: EPS cladding above the exit	No	Yes	No	Yes: Flashover risk from above SOUs (no sprinklers to SOUs)	Yes	No	No	No	No: No connecting to ground level – benign fire is not likely to become problematic	Yes: Cladding above the exit poses a risk to occupants Removal of cladding around SOUs is required to safeguard egress path of occupants
Figure 32	EPS: EPS cladding to partition walls for SOUs above exit	No	Yes	Yes: Balcony acts as canopy and provides protection to exit	Yes: Balcony areas	No	Yes	No	Yes	No	No: Cladding above does not affect the exit due to the geometry of the building

Image reference and link	Is there in-scope material around or above the exit?	Can the combustible cladding be considered trivial?	Is there combustible cladding above the exit?	Is there a structure above the exit that will protect occupants?	Is there an ignition source for combustible cladding above the exit?	Is the exit cladding linked to SOU / other common (internal) area?	Is there sprinkler protection to a linked SOU / other common (internal) area?	Is there sprinkler protection to the exit?	Does the geometry of the exit provide safe egress for occupants?	Does combustible element extend to ground level allowing for benign fire ignition?	Are remedial actions required?
Figure 33	EPS/ACP: EPS cladding around exit – ACP to canopy fascia panels only. SOUs are sprinkler protected.	No	Yes: EPS cladding above	Yes: Canopy has N.C.E soffit panels and is considered to provide protection to occupants exiting the building	Yes: Cladding above exit connects to the ground	No	Yes	No	No	Yes: Cladding connects to the ground level. Benign fire could become problematic	Yes: Removal of cladding at ground level to address ignition source
Figure 34	ACP: ACP cladding above exit and to either side – no sprinkler protection to SOUs or exit	No	Yes	Yes: Canopy above exit provides protection for above	Yes: Cladding above the canopy is at risk of ignition but the canopy roof provides protection to exit	No	No	No	No: Canopy sofit panels are ACP and a connection to ground is present	Yes: Cladding to left and right of exit connects to ground and canopy sofit panels above. A benign fire could become problematic.	Yes: Cladding removal around exit – break connection to ground
Figure 35	ACP: ACP panel above exit	No	Yes	No	Yes: SOU balcony areas connect to the cladding on either side and flashover	Yes	No	No	No	No	Yes: Cladding above the exit will need to be removed as both the balcony areas and flashover is possible risk of ignition to the cladding
Figure 36	EPS: Cladding around/above the exit – no sprinkler protection	No	Yes	No: No large enough for occupants to move under	Yes: Common area above the exit poses ignition risk to cladding above	Yes	No	No	No	Yes: Cladding around exit connects to ground level	Yes: Removal of cladding accessible above the exit and cladding at ground level that connects to the ground
Figure 37	EPS: EPS above the exit – no connection to ground	No	Yes	No: Canopy does not protect whole exit, cladding above extends past canopy edge	Yes: Balcony area is connected to cladding over exit	No	No	No	No	No	Yes: Cladding accessible via balcony area poses risk to occupants exiting the building. Removal of cladding to mitigate ignition risk recommend.
Figure 38	ACP: ACP cladding to awning over and to either side of exit – No sprinkler protection to SOUs	No	Yes	Yes	No	No	No	No	Yes: Occupants can move under a return of the building before need to move under ACP canopy	No	No: No ignition risk to cladding that would not be considered problematic. Geometry of building allows for safe egress away from ACP.
Figure 39	ACP-FR: Material out of scope	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No: Material out of scope – no action required

Image reference and link	Is there in-scope material around or above the exit?	Can the combustible cladding be considered trivial?	Is there combustible cladding above the exit?	Is there a structure above the exit that will protect occupants?	Is there an ignition source for combustible cladding above the exit?	Is the exit cladding linked to SOU / other common (internal) area?	Is there sprinkler protection to a linked SOU / other common (internal) area?	Is there sprinkler protection to the exit?	Does the geometry of the exit provide safe egress for occupants?	Does combustible element extend to ground level allowing for benign fire ignition?	Are remedial actions required?
Figure 40	ACP: ACP above and to both sides of exit	No	Yes	Yes: Small return can protect occupants from fall debris	Yes: Connection to ground level	No	Yes	No	No: Sofit panels are ACP	Yes: Connection to ground level – benign fire could become problematic	Yes: Removal of cladding that connects to ground level
Figure 41	ACP: Cladding to left, above (fascia and soffit panels of canopy)	No	Yes	Yes	No	No	No	No	No: Sofit panels are ACP and are at risk of ignition	Yes: Connection to ground level – benign fire could become problematic	Yes: Removal of cladding that connects to ground level
Figure 42	ACP: ACP feature over egress path to street	No	Yes	No	No	No	No	No	No	No: No connection to ground	No: No risk of ignition
Figure 43	EPS/ACP: Small amount of EPS above exit, ACP canopy, EPS above	No	Yes	Yes: Canopy protects exit from EPS cladding above	Yes: Balcony areas to left of the EPS above the exit are a potential ignition source	Yes	No	No	No: Sofit panels are ACP	No: Cladding does not connect to the ground	No: No risk of ignition at ground level, canopy provides shelter from above
Figure 44	ACP: ACP cladding to canopy and cladding above and to the right of the exit	No	Yes	Yes	No: SOUs are sprinkler protected	Yes	Yes	Yes	No: Sofit panels are ACP	No	No: No ignition source for cladding around exit or above – sprinkler protection to exit and SOUs
Figure 45	EPS/ACP: EPS around exit (connect to ground level) Canopy above exit protects from EPS and ACP	No	Yes	Yes	No	No	No	No	Yes: Canopy above exit provides protection from C.E above	Yes: Cladding around exit connects to ground level	Yes: Removal of cladding around exit that connects to ground to mitigate risk of ignition from benign source
Figure 46	EPS/ACP: EPS around exit. EPS and ACP above (no connection to ground level).	No	Yes	Yes	Yes: Balcony areas pose an ignition risk to ACP	No	N/A	No	No: Cladding around the exit can not be avoided by the occupants	Yes: Cladding around exit connects to ground level. Begin fire source could become problematic.	Yes: Removal of cladding at ground level to protect the single exit
Figure 47	ACP: Small decorative strip to left side of exit	Yes	Yes	No	Yes: Connects to ground level	N/A	N/A	N/A	N/A	N/A	No: Amount of cladding is considered trivial

Image reference and link	Is there in-scope material around or above the exit?	Can the combustible cladding be considered trivial?	Is there combustible cladding above the exit?	Is there a structure above the exit that will protect occupants?	Is there an ignition source for combustible cladding above the exit?	Is the exit cladding linked to SOU / other common (internal) area?	Is there sprinkler protection to a linked SOU / other common (internal) area?	Is there sprinkler protection to the exit?	Does the geometry of the exit provide safe egress for occupants?	Does combustible element extend to ground level allowing for benign fire ignition?	Are remedial actions required?
Figure 48	EPS/ACP: EPS around exit – linked to SOU to right side. ACP above exit EPS to balcony balustrades	No	Yes	No	Yes: Balcony areas	Yes: SOU to right side of the exit connected by EPS cladding	Yes	No	No	Yes	Yes: ACP/EPS above the exit to be removed to safeguard the exit from falling debris. EPS around the exit to be removed to safeguard the exit from benign fire source. EPS around SOU to right of exit to remain due to sprinkler protection.
Figure 49	ACP to facia panels above exit	No	Yes	No	No	No	N/A	No	No	No: Cladding does not link to ground level	No: ACP not at risk of ignition from balcony areas or ground benign fire

Example Exit Assessments (buildings with multiple exits)

Image reference and link	Is there more than one designated exit for the building?	Is cladding around the primary exit linked to SOUs or common (internal) area?	Is there a risk of ignition to linked cladding?	Are remedial actions required?
Figure 14	Yes	No	No	No remedial actions required. No risk of simultaneous fire in SOU and primary exit.
Figure 28:	Yes	Yes	Yes	Remedial actions required. Cladding removal or sprinkler protection to linked SOUs.
Figure 35	Yes	Yes	Yes	Remedial actions required. Cladding removal or sprinkler protection to linked SOUs.

Images of exit examples

Note: These exit examples and the combustible cladding marked have been prepared to represent a variety of egress configurations for consideration. They SHOULD NOT be interpreted as being a true representation of the actual cladding configuration or the cladding type used on the building photographed.

Figure 14: Single exit, ACP to canopy fascia. Soffit panels are non-combustible material, non-sprinklered exit.

Figure 15: Single exit, ACP cladding to spandrel panels to the left of the exit, non-combustible material around the exit. Non sprinklered exit/building.

Figure 16: ACP cladding to fascia panels on canopy. Non-sprinklered building/exit.

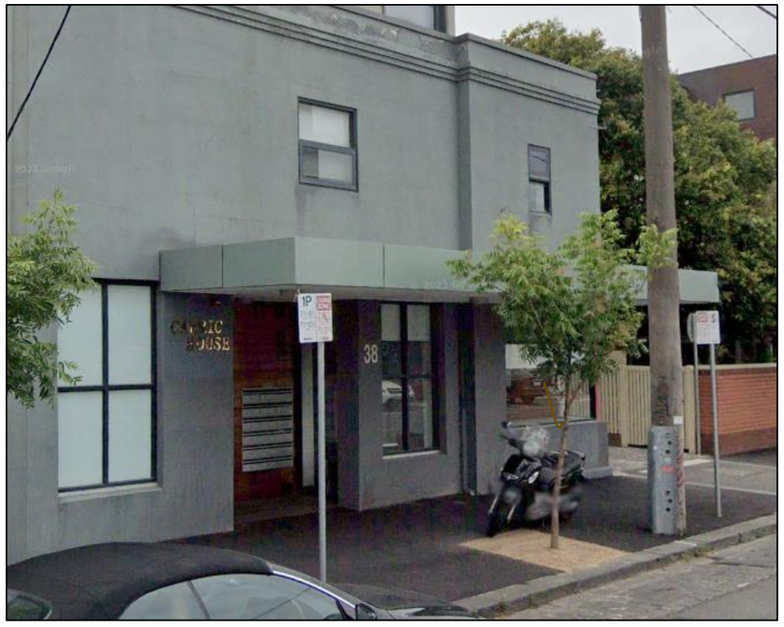


Figure 17: ACP panels to canopy (fascia and soffit panels). Non sprinkler protected exit/SOUs.

NOTE: These exit examples and the combustible cladding marked have been prepared to represent a variety of egress configurations for consideration. They SHOULD NOT be interpreted as being a true representation of the actual cladding configuration or the cladding type used on the building photographed.

Figure 18: ACP panels to soffit and fascia of canopy. SOU and canopy is sprinkler protected.

Figure 19: ACP panels to canopy (soffit and fascia) as well as vertical panels to the ground level on the left of the exit. SOUs are sprinkler protected but canopy not protected.

Figure 20: ACP canopy (soffit panels and fascia), sprinkler protection to SOUs no protection to exit.

Figure 21: ACP to awning (fascia and soffit panels). No sprinkler protection to SOU or exit.

Figure 22: ACP to canopy (fascia and soffit panels) no protection from sprinklers.

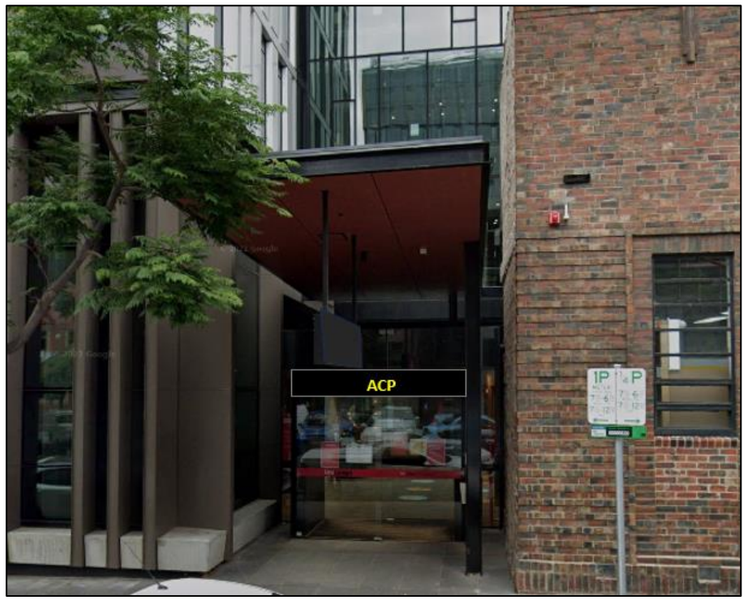


Figure 23: ACP panel at the head of the exit door.

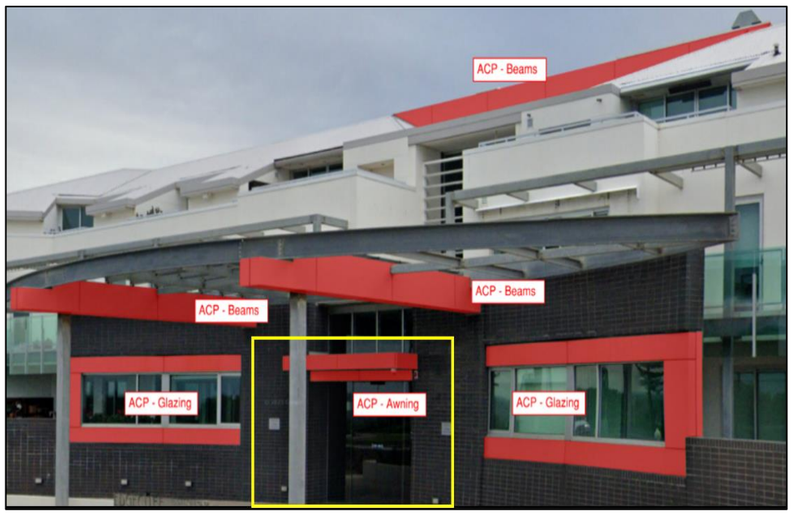


Figure 24: ACP cladding above and to either side of the exit. No sprinkler protection to SOU or exit.

Figure 25: ACP above and to the left of exit – SOUs and exit not sprinkler protected.

Figure 26: Single exit building, EPS to either side of the exit. No sprinkler protection.

Figure 27: ACP cladding to service doors on the left of the exit. No sprinkler protection to exit.

Figure 28: EPS cladding on SOUs above and below the exit. EPS to cladding around the exit. Sprinkler protection to SOUs.

Figure 29: EPS used on the fascia of the canopy around the exit lobby.

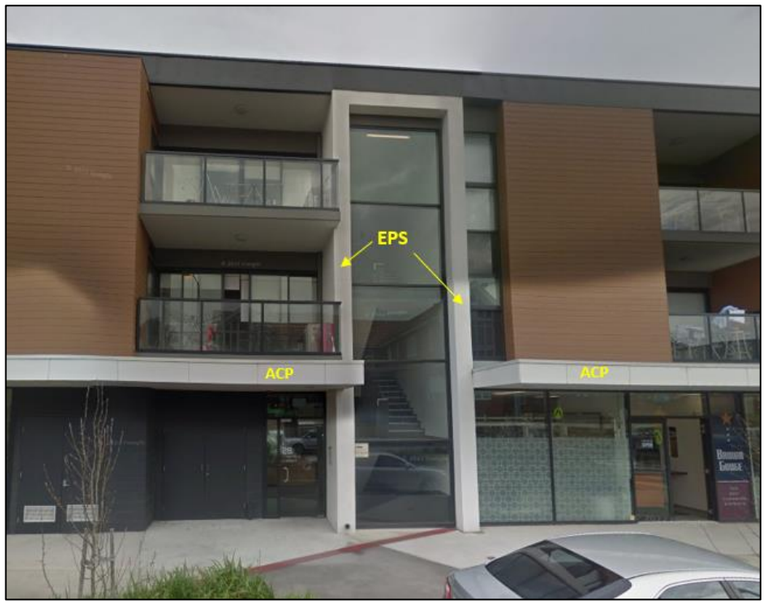


Figure 30: EPS panels above the exit and ACP to canopy face – sprinkler protection to SOUs.

Figure 31: EPS cladding to the walls above the exit and the egress path from the exit – no sprinkler protection to SOUs or exit.

Figure 32: EPS cladding to SOU partition – sprinkler protection to SOU.

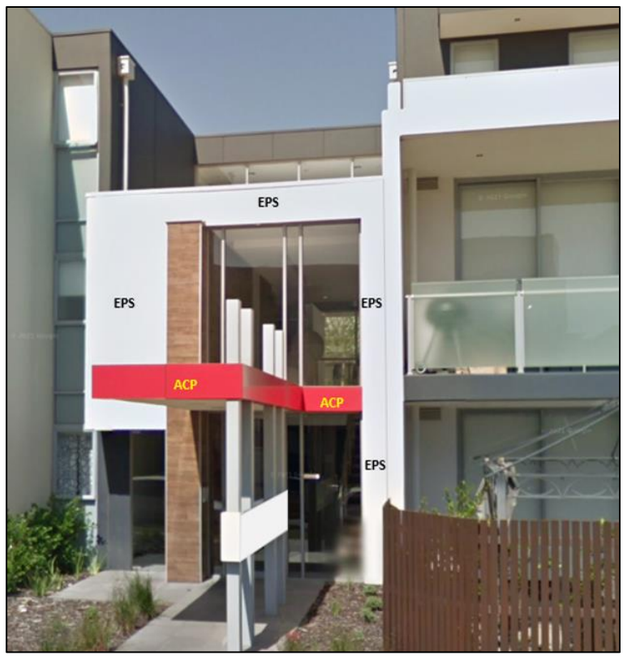


Figure 33: Exit has EPS that extend to the garden bed on the side of the exit. The exit canopy has ACP fascia lining with non-combustible soffit.

Figure 34: ACP cladding to canopy above and to either side of exit, no sprinkler protection to SOU or exit.

Figure 35: ACP to cladding above exit, no sprinkler protection to SOUs or exit.

Figure 36: EPS on L1 and L2 on external walls over the main entry/exit – no sprinkler protection. SOU to the right of the exit.

Figure 37: EPS on L1 and L2 on external walls to side and behind the main entry/exit. Sprinkler protection to SOUs.

Figure 38: ACP awning projection forward of the external wall at GFL. No sprinkler protection to SOUs.

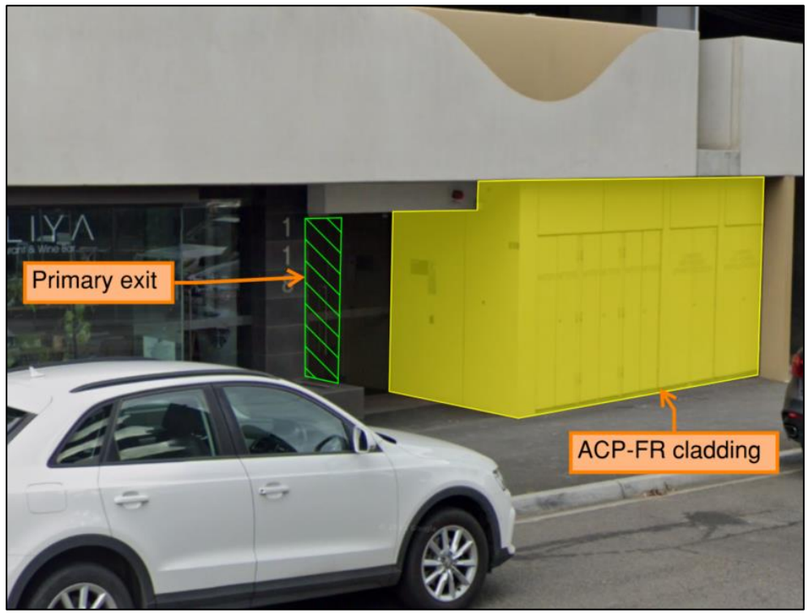


Figure 39: ACP-FR panels on the right side of the primary exit.

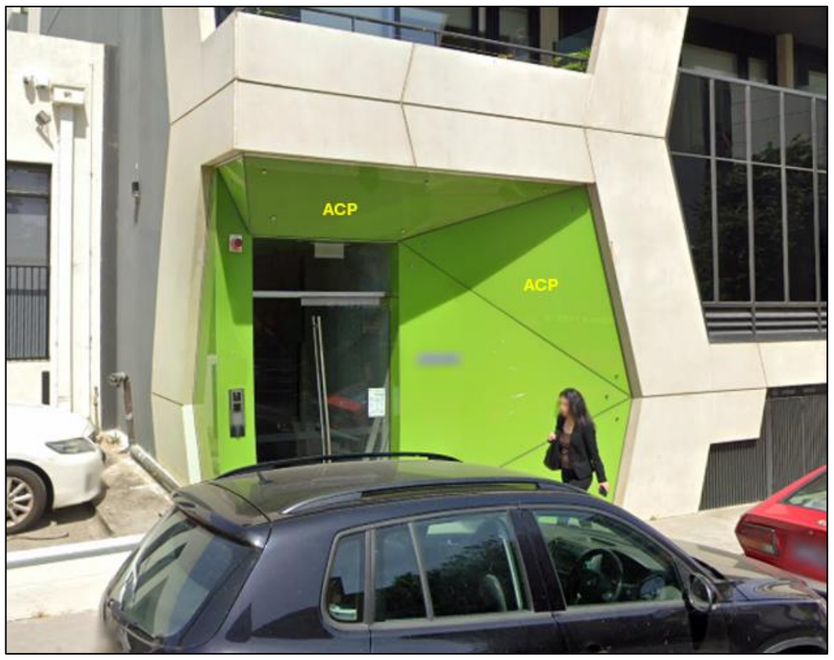


Figure 40: ACP cladding directly above and to both sides of the exit door. Sprinkler protection to SOUs.

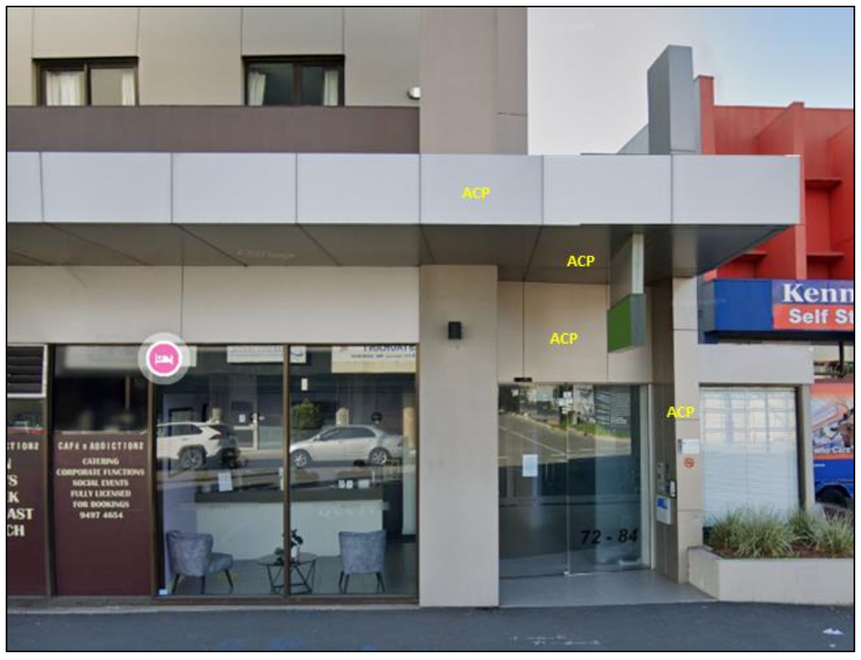


Figure 41: ACP lining to the side of the exit alcove, at the head of the exit door and lining the face and soffit of canopy.

Figure 42: ACP canopy feature over and to side of the egress path to street.

Figure 43: Element of EPS above the door. ACP on the soffit and face of the canopy. Sprinkler protection to SOUs.

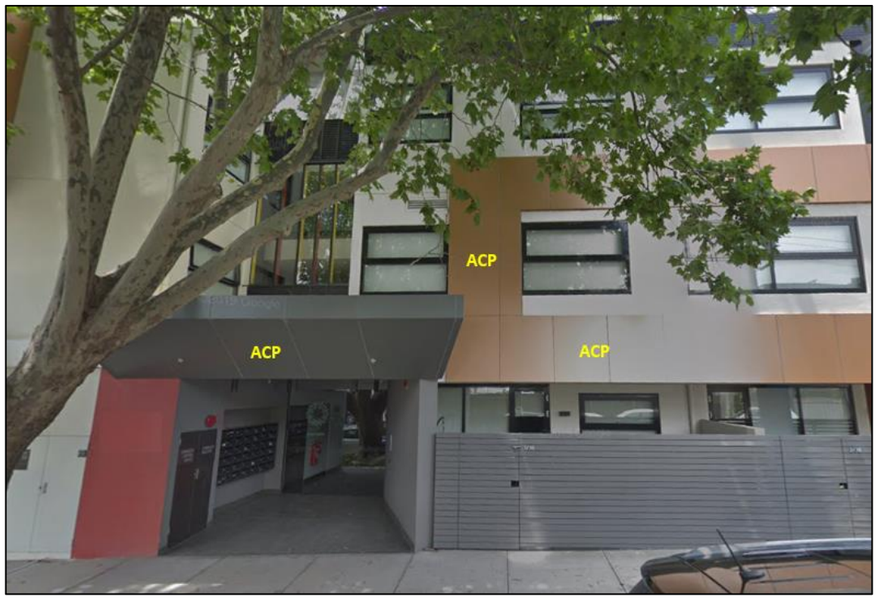


Figure 44: ACP canopy and soffit to entry alcove. ACP on front facade adjacent window openings. Sprinkler protected internally and within entry alcove.

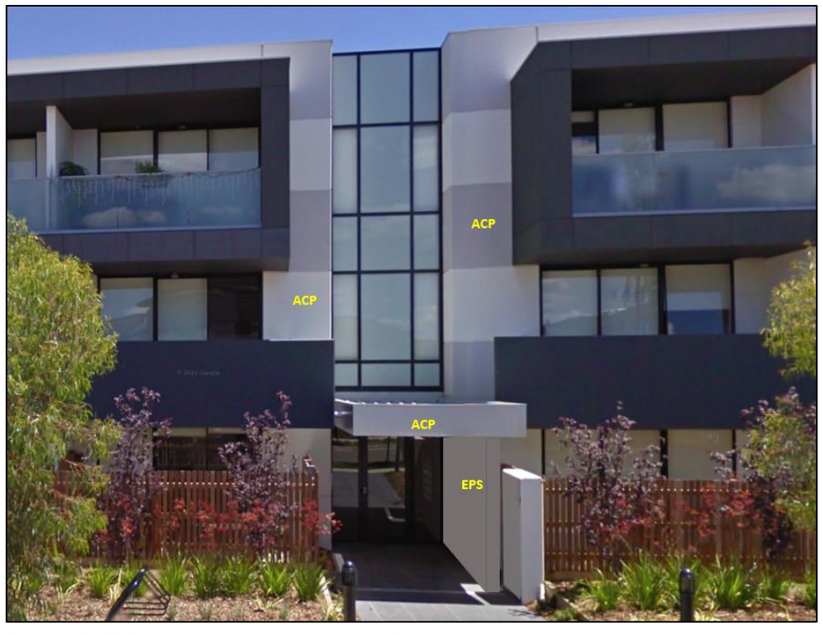


Figure 45: EPS at side of the entry alcove. ACP to face of canopy and to walls above the canopy.

Figure 46: EPS surrounds the singular designated exit of the building. A canopy protects the exit from ACP and EPS above. The building is sprinkler protected.

Figure 47: ACP element to the left side of the singular exit on the building. Sprinkler protection to SOUs.

Figure 48: EPS and ACP to building. Sprinkler protection to SOUs.

Figure 49: ACP above single exit. SOUs are sprinkler protected.