Cavity barriers in building façades

Fire Protection Association Australia
TAC/18/19 Good Practice Guide
Version 1, March 2026

Agenda

- Introduction to our panel members: Martin, Warwick and John
- Introduction to the TAC/18/19's work on the Good Practice Guide (GPG) for Cavity barriers in building façades – why we did this
- Façade types we see in construction
- Panel discussion on the GPG
- Q&A session from the audience

Façade types

These are broken up into 4 sub-classes, but the GPG only deals with 1 of them

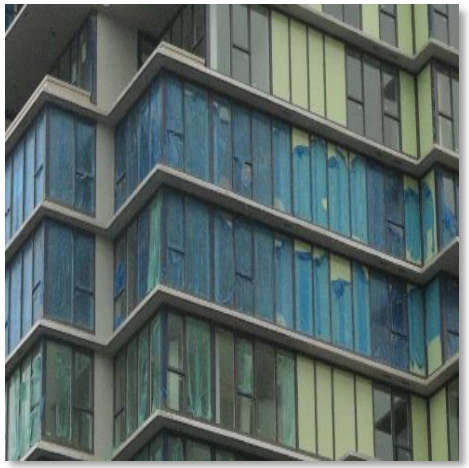
Most common façade types

Curtain Wall

Ventilated Façade

Pressure Wall / Structural Glazing

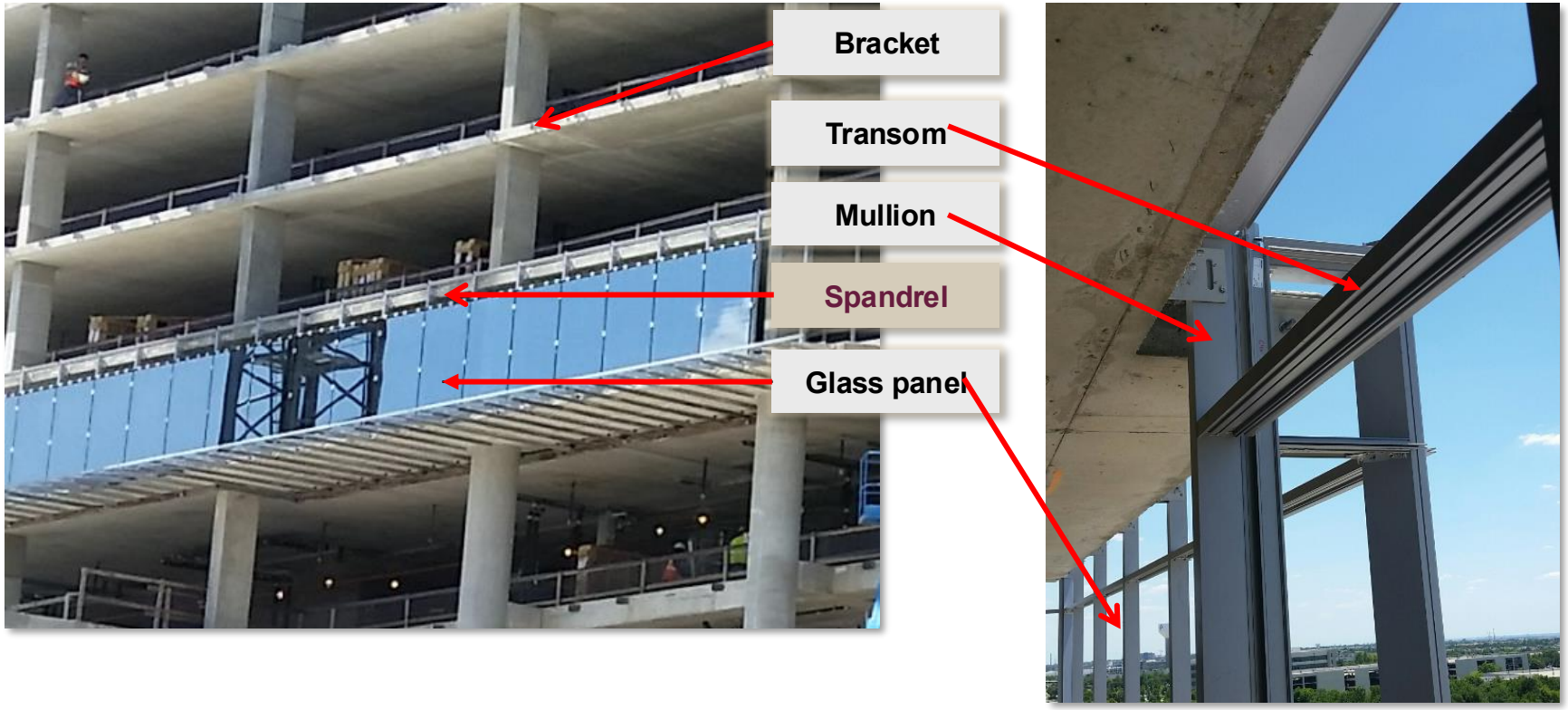
Window Wall



GPG is focused on Curtain Wall façades

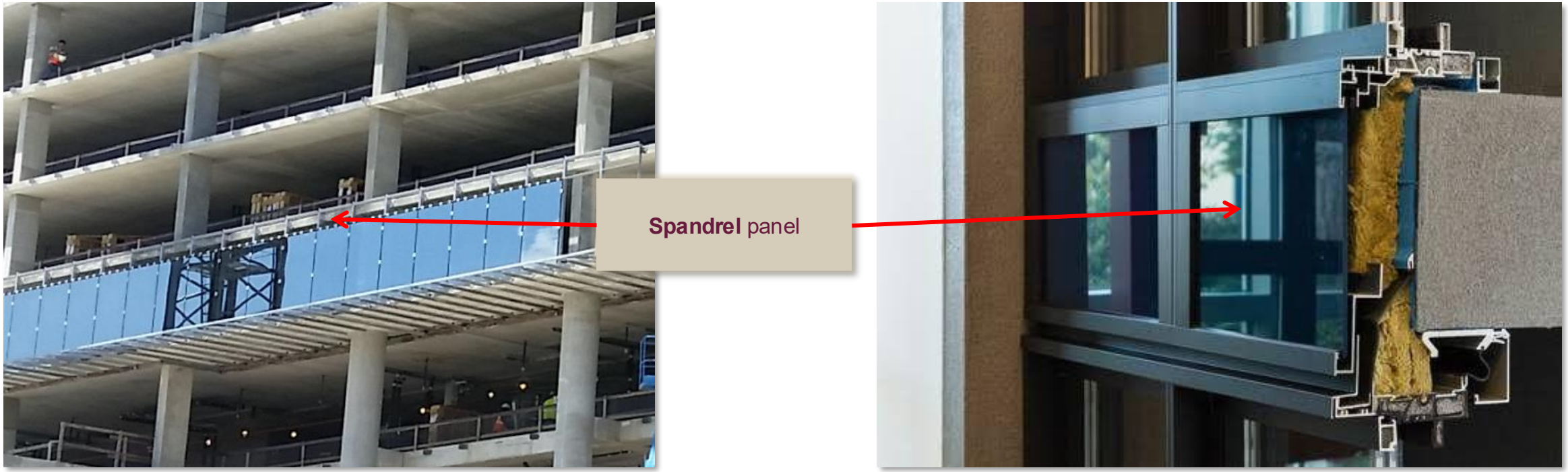
Curtain Wall components

The main elements of the curtain wall are **vertical mullion, horizontal members, spandrel & vision panels, brackets, gaskets, sealants, insulation.** The mullion, transom and the spandrel are usually made from extruded aluminium. The brackets, HDG.



What exactly is a Spandrel? This term comes up a lot when discussing Cavity barriers in building façade

A **Spandrel** is a **non-structural member*** between the windows to conceal the slab. There is normally a Cavity between the edge of the slab and the Spandrel.



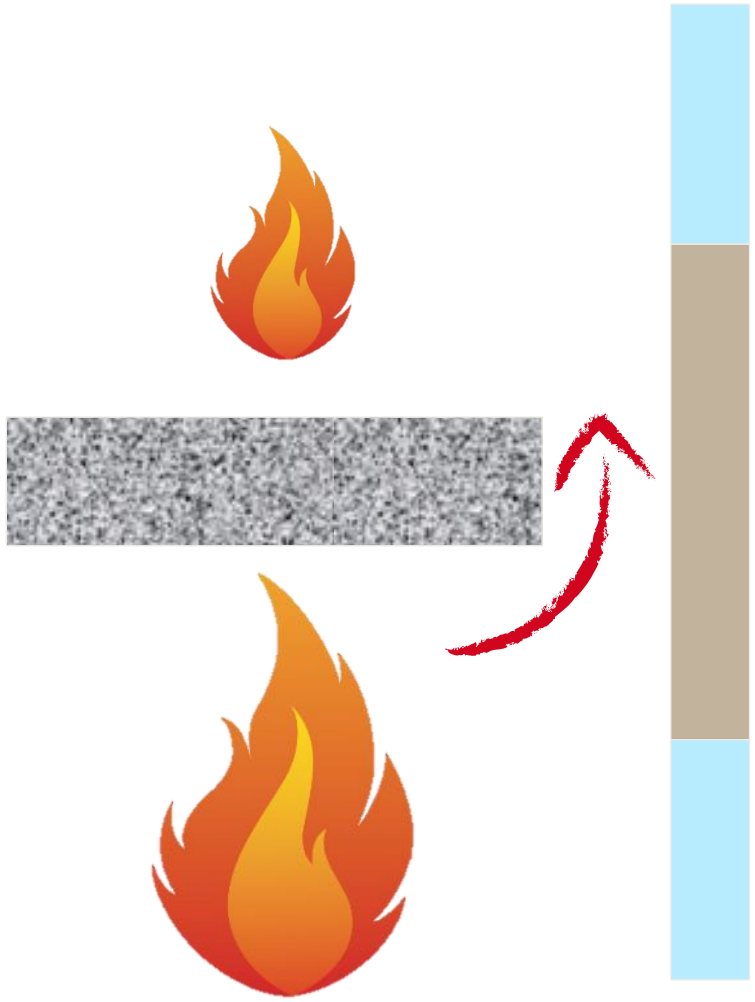
*The FRL of the Spandrel is not in scope of the GPG

How fire and smoke spreads in Curtain Wall façades

There are three potential pathways

Why passive firestop in the Curtain Wall scenario is so important

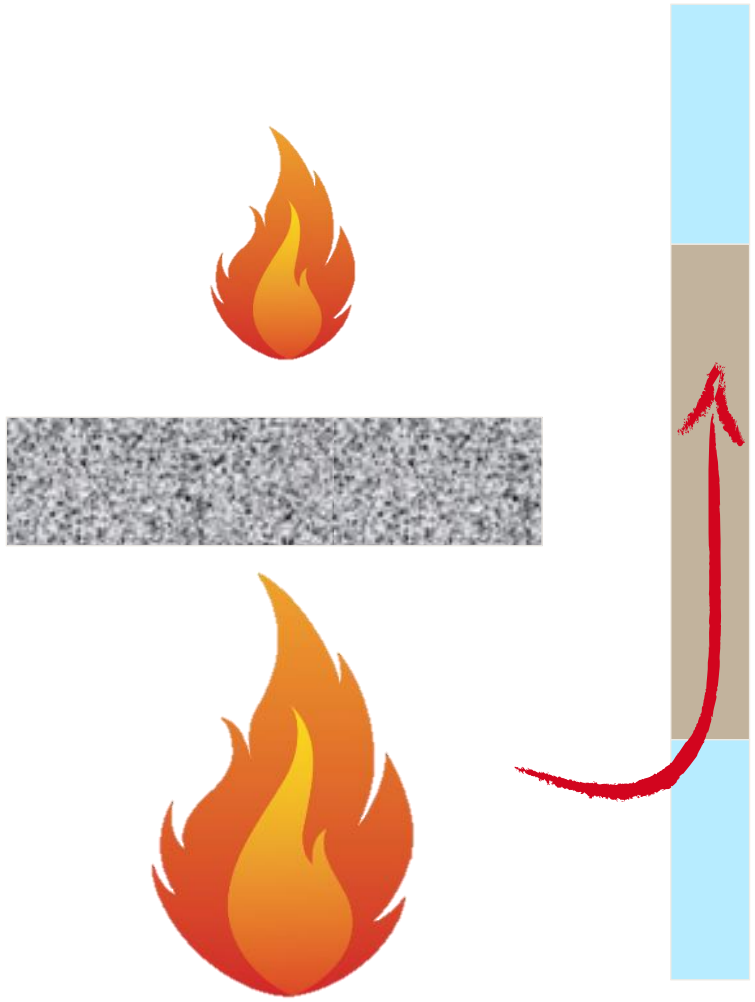
During fire, there are **three potential pathways** for **smoke and fire spread**.



1. Room to room above between the edge of the floor slab and the Spandrel.

Why passive firestop in the Curtain Wall scenario is so important

During fire, there are **three potential pathways** for **smoke and fire spread**.



2 Through the façade spandrel to the storey above.

Why passive firestop in the Curtain Wall scenario is so important

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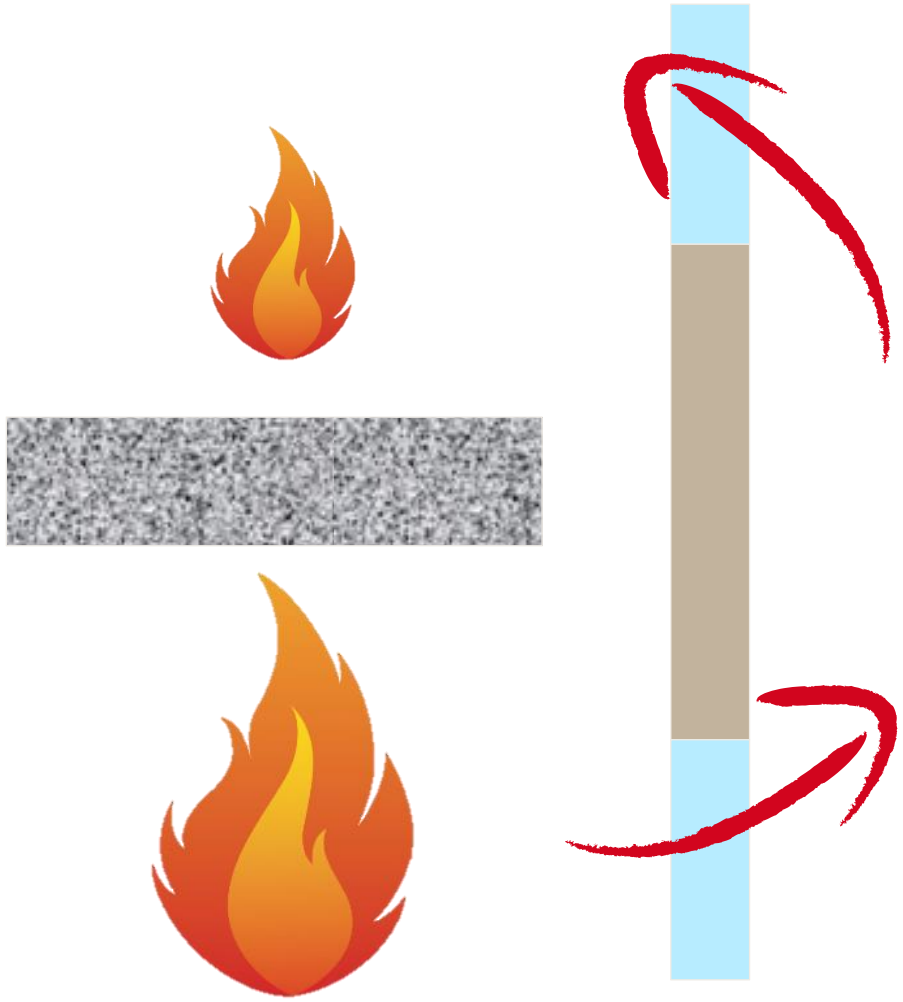
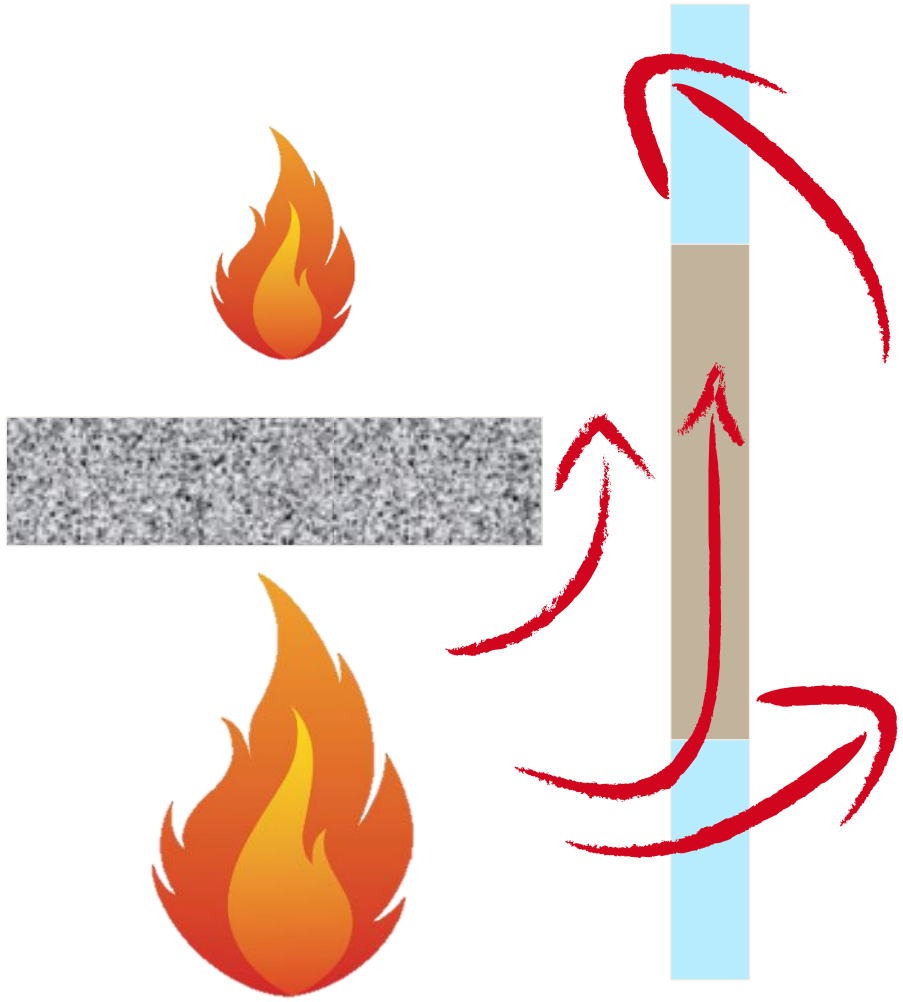


3 From a room via a window to the outside and through the window above

Why passive firestop in the Curtain Wall scenario is so important

During fire, there are **three potential pathways** for **smoke and fire spread**.

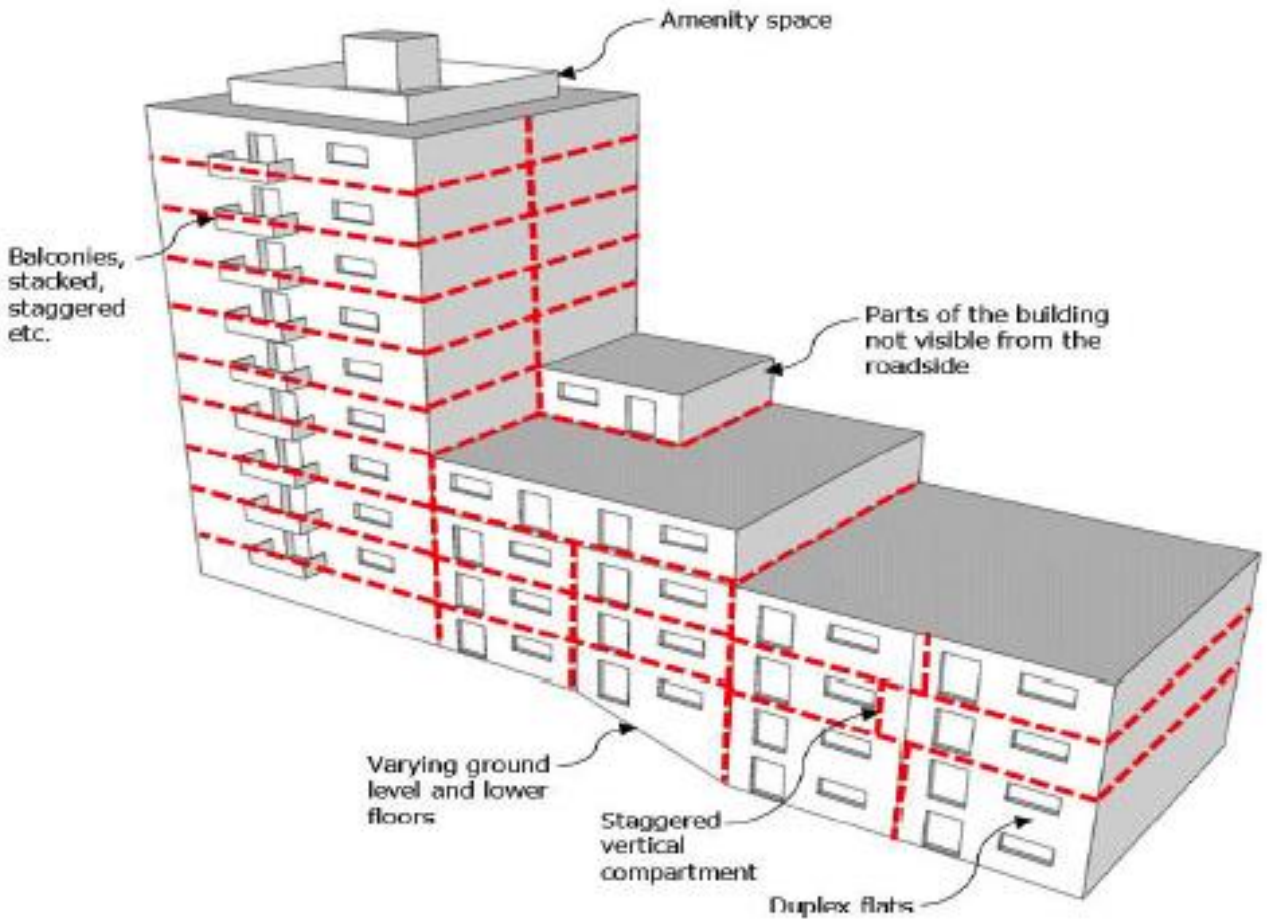


1. Room to room above via the cavity between the edge of the floor slab and the spandrel.
2. Through the façade / spandrel to the storey above.
3. From a room via a window to the outside, through the window above.

NCC requirements for passive fire protection of cavities

There are 3 relevant performance requirements CP2 / CP5 / CP8

Compartmentation needs to be preserved



Compliance for Compartmentation requires NCC Parts C1 / C2 / C3 to be adhered to

- **Vertical** (walls)
- **Horizontal** (floors / ceilings) building elements
- Have necessary fire resistance
- Service penetrations / **construction joints** / cavities / gaps
- Treated with **passive firestop material** to match fire resistance of the vertical and horizontal building elements
- Compartmentation is provided by a cavity barriers + walls and floors, until FRL of the barriers is reached / curtain wall façade system is breached / collapses under exposure to fire.
- Practical impact of cavity barriers is to maintain a barrier to smoke and fire spread for the full duration of the surrounding elements

https://www.gov.scot/publications/scottish-advice-note-determining-fire-risk-posed-external-wall-systems-existing-multi-storey-residential-buildings-version-2-0/pages/9/

Performance requirements

CP2 spread of fire

- Performance Requirement CP2 establishes expectations to avoid the ‘Spread of fire’ in a building

CP5 concrete panels

- ‘Behaviour of concrete walls in a fire’ establishes expectations that pre-cast concrete panels must be designed such that in the event of fire they will not collapse outwards. This is relevant to the Pre-cast façade panel arrangement and is more of a structural issue than one of fire spread.

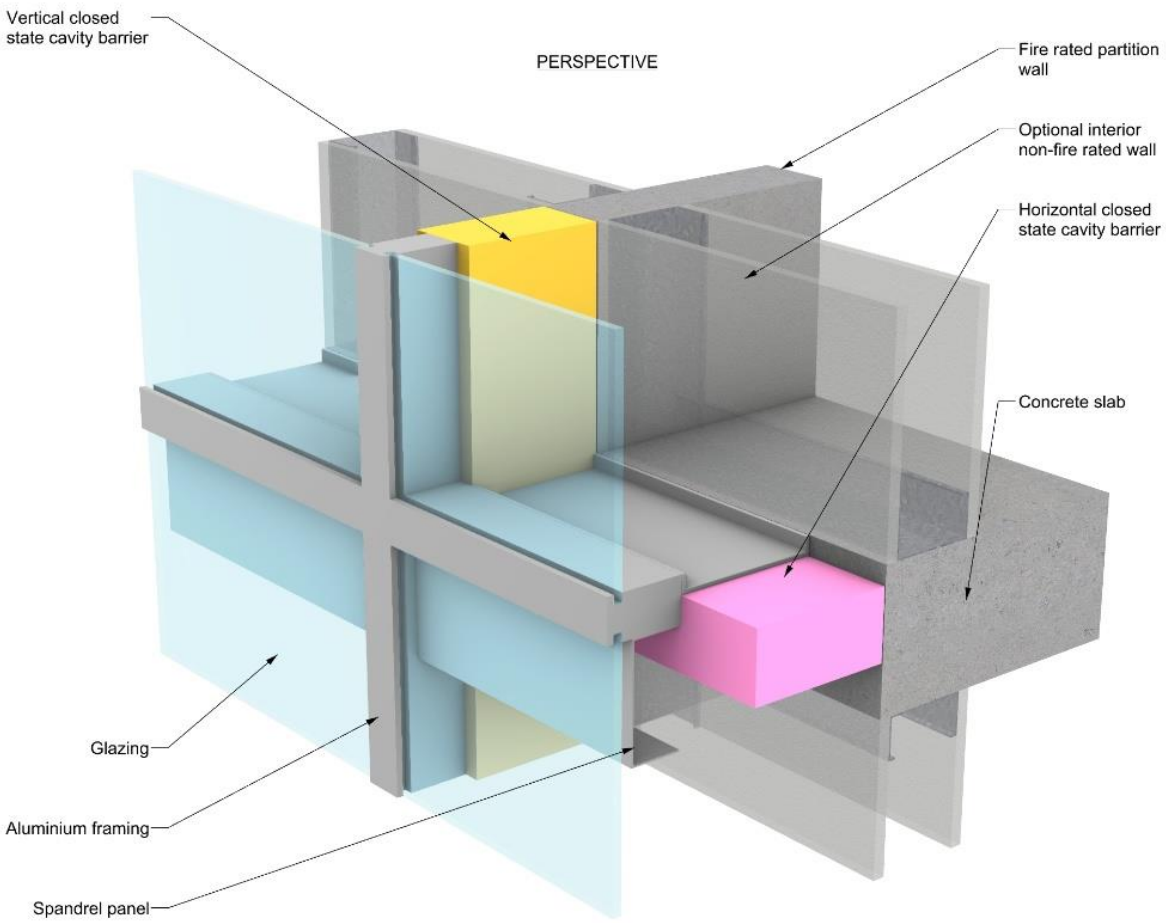
CP8 openings and penetrations

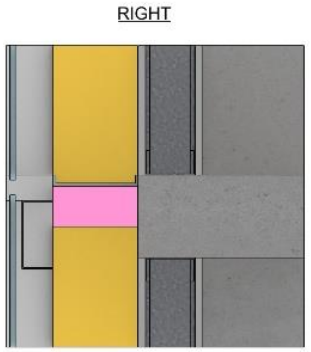
- ‘Fire protection of openings and penetrations’ requires building elements to resist the spread of fire to be protected so that an adequate level of performance is maintained where openings, construction joints and like occur

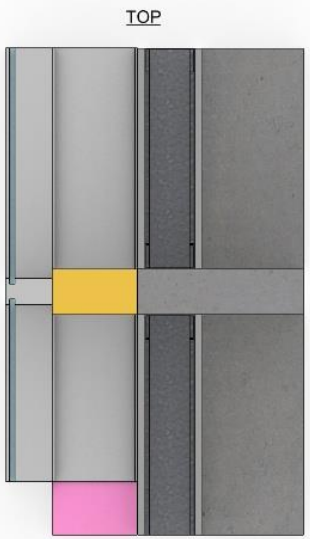
How to protect the Cavity

Typical configurations of cavity barriers

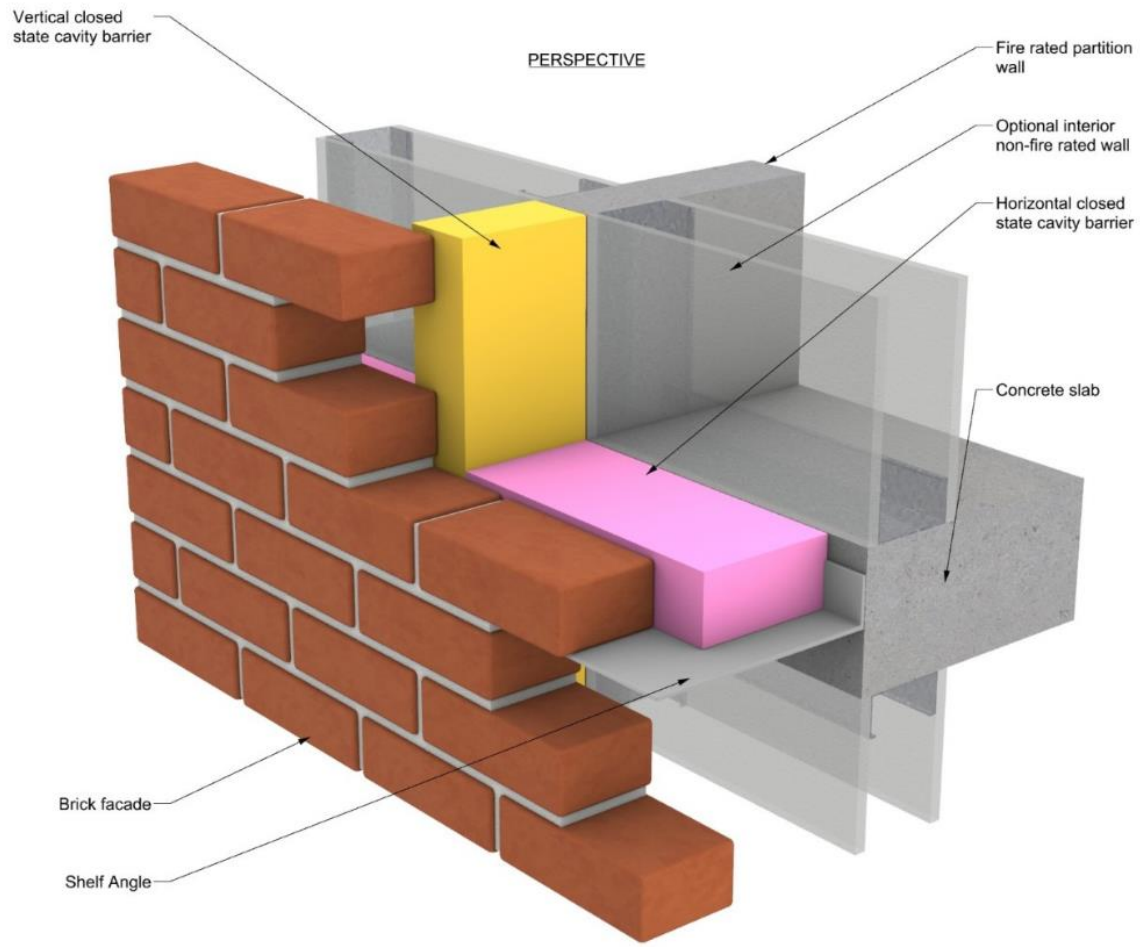
Curtain wall façade

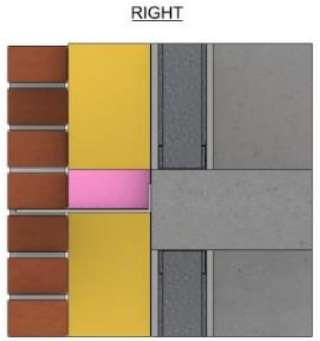


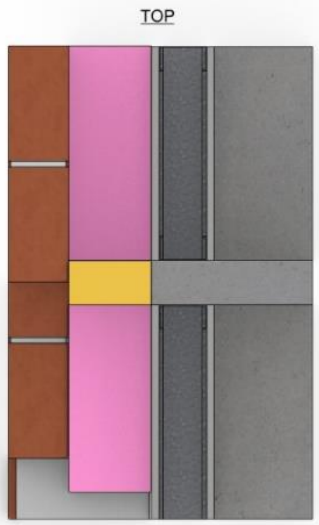




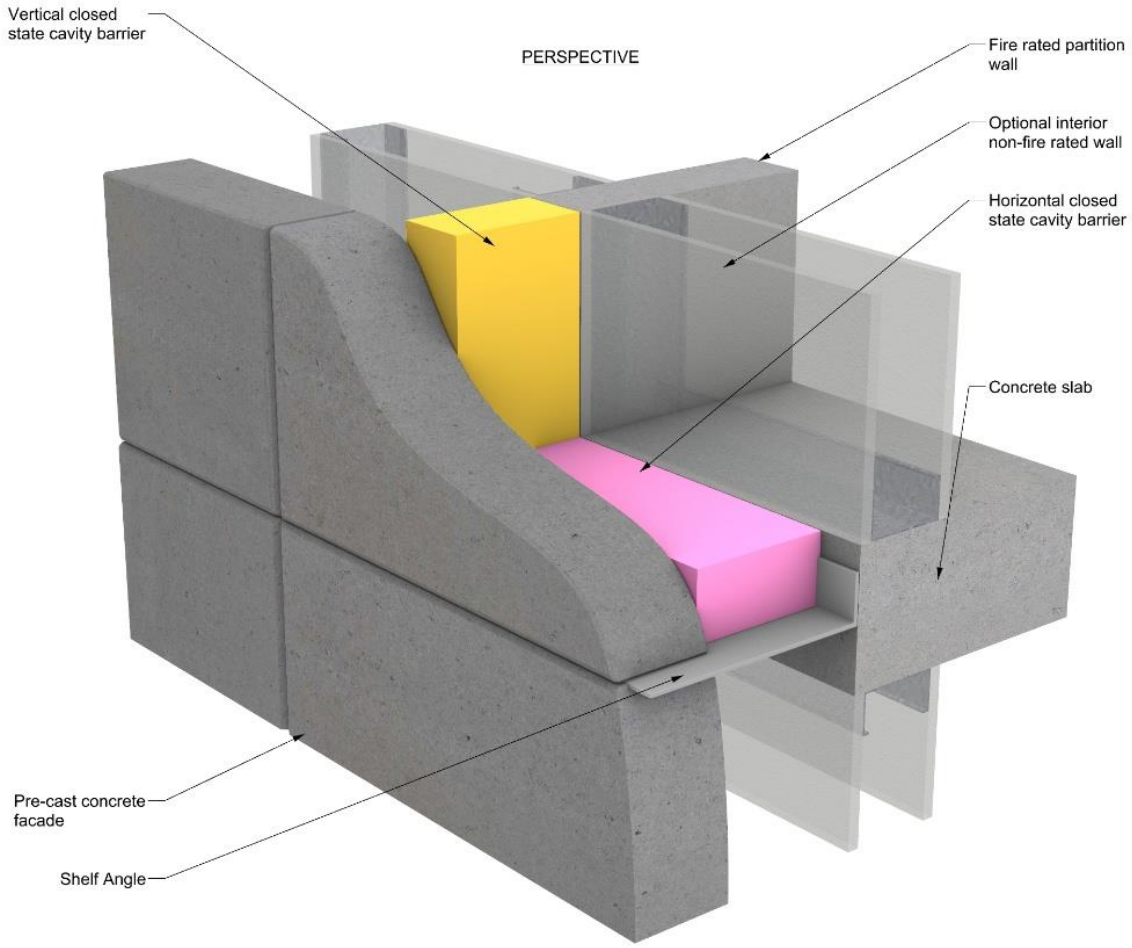
Brick veneer façade

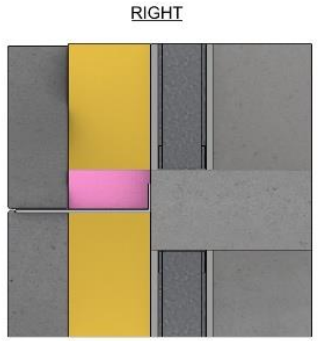


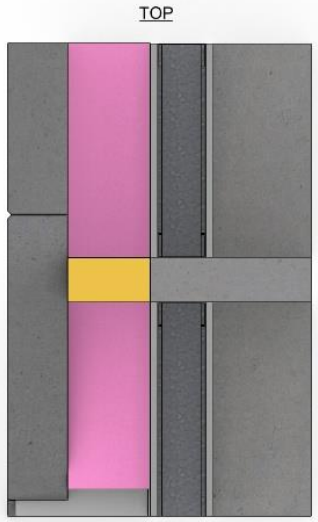




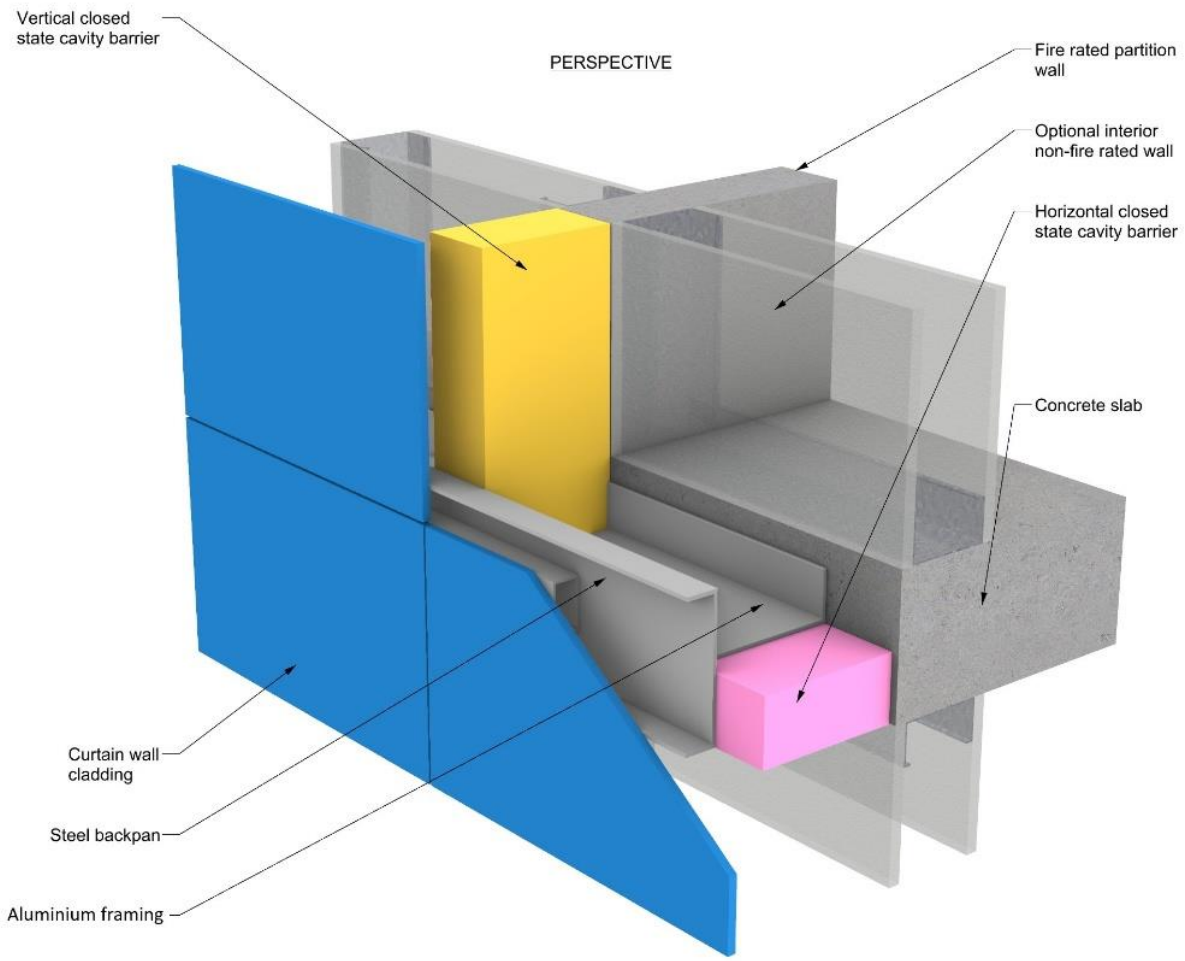
Precast concrete panel façade

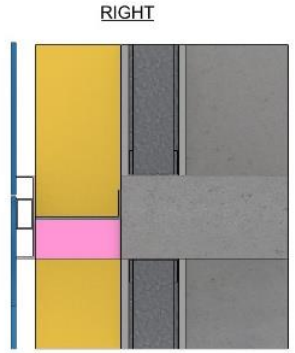


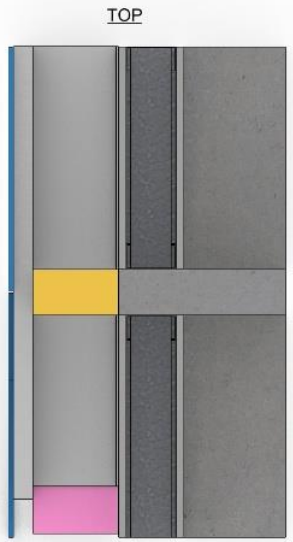




Cladding steel backpan







(1) Site-fabricated solution for a Cavity barrier

Metal flashing with caulking at the edges

- Mineral wool is compressed and inserted between the Spandrel and floor slab at the edge of the floor slab. A metal flashing is then cut to size and fastened over the mineral wool, using nails from a direct fastening tool. The edges of the metal flashing are then sealed with a caulking gun. The sealant used is typically a passive fire product for construction joints

(2) Dry, preformed solutions

Mineral wool carrier

- A pre-formed and ‘dry’ solution for a Cavity barrier typically consists of a rigid or semi-rigid element with mineral wool as a base material. This forms a system that provides the necessary fire resistance to preserve horizontal compartmentation.

(3) Wet solutions

Silicon or Acrylic intumescent spray

- Mineral wool is compressed and inserted between the Spandrel and floor slab at the edge of the floor slab. An acrylic or silicon based intumescent material is then sprayed or painted over the mineral wool. The combination of materials then forms a system that provides the necessary fire resistance to preserve horizontal compartmentation

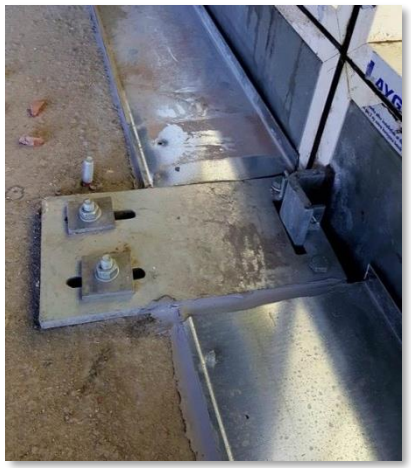
Additional design attributes

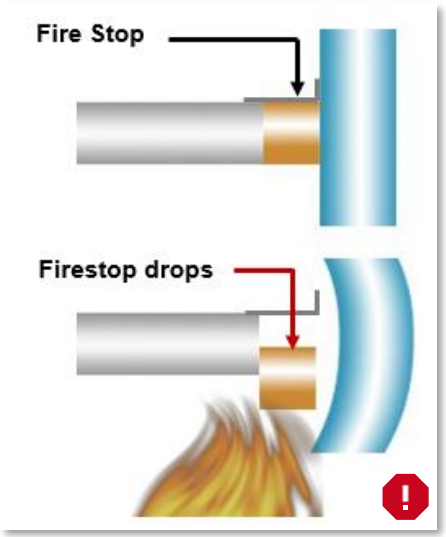
Movement needs to be considered

Cavity barrier for a Curtain Wall needs movement capability in addition to its fire protection capability

Curtain wall

Edge of slab treatment





Technical issue with metal flashing:

- Caulking can only tolerate ~ 6 mm of movement.
- Caulking at edges of metal cannot accommodate absolute amount of movement ± 2 to 15 mm of curtain wall.
- Caulking will fail, allowing smoke and fire passage.
- Failure of caulking will disturb acoustics as well.

AS 4072.1 Section 2.1 General

3 A sealing system for a control joint should be capable of withstanding the movements that are likely to occur for the application in which it is used without cracking, splitting or adhesion failure.

4 Joints should only be used in applications where the expected movement is not greater than the amplitude for which a specimen performed satisfactorily in this test.

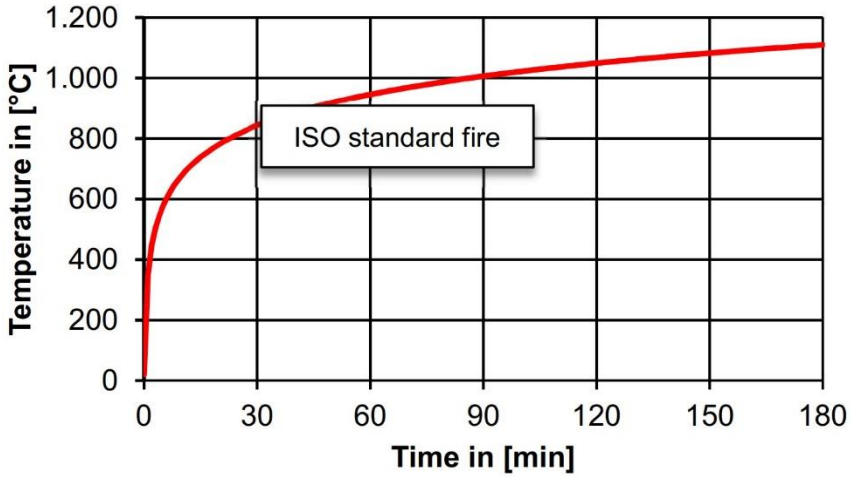
5 Appendix C provides a list of documents that can be used to evaluate the physical performance of control joint seals.

Other systems:

- Movement capability in general should always be assessed.
- Examples - Stone wool-based systems are typically not compressible, movement capability needs to be demonstrated – Fixed steel flashing arrangements should also need their movement capability checked.

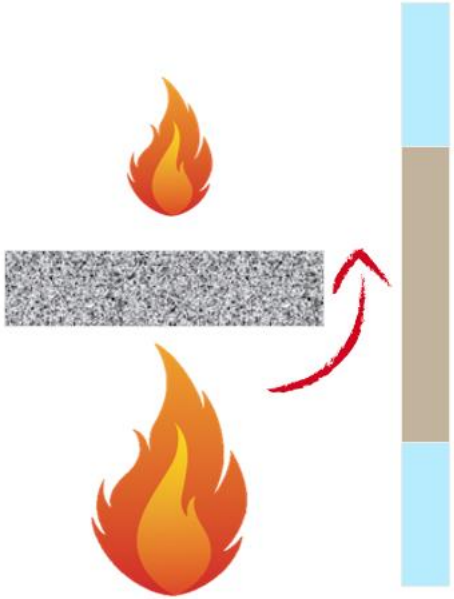
To assess the level of performance (FRL) required for the Cavity as per CP8, we can use AS1530.4 #10

Section 10: Service penetrations and **Control joints**

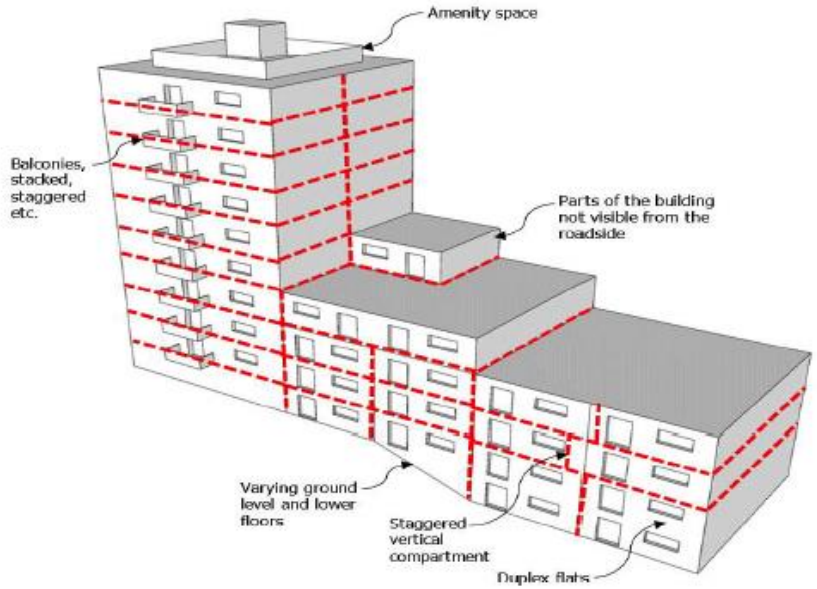


TAC/18/19 GPG for Cavity Barriers clarifies the need and DtS pathway for Passive Fire in Curtain wall façades

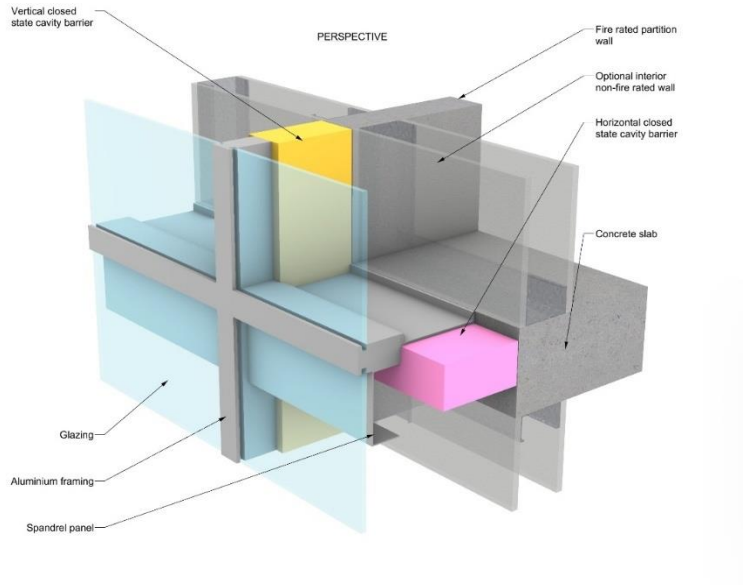
Fire can spread through the Cavity



Compartmentation MUST be preserved



Passive firestop solutions are available and DtS path is #10 AS1530.4*



*AS4072.1 also requires movement to be considered.

Thank you

Martin Stirling (Hilti)**, Warwick Scott** (Boss Fire)**, John Henry** (Trafalgar)

TAC/18/19 committee, chaired by Mark Prior (BOSS Fire)