

BUILDING SEPARATION EXPLAINED (PART 1)

Part 1 of this edition of Explained takes a look at the principles underpinning building separation to avoid external fire spread from one building to another.

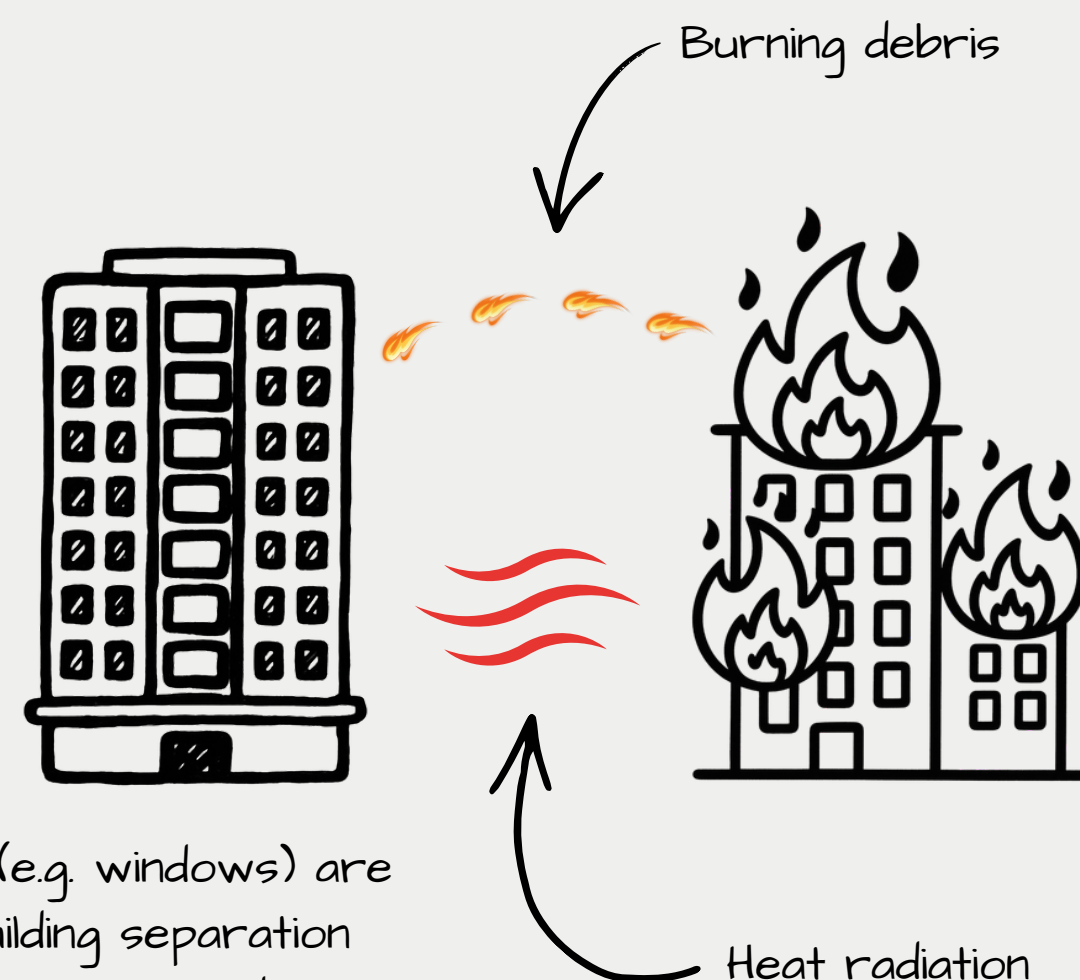
Background

The principle behind building separation is to limit the risk of a fire in one building spreading to another via heat radiation and/or burning debris. Heat radiation can ignite materials at a significant distance from the original fire location and its intensity is dependent on the temperature within the fire compartment. The values that are used today for separation calculations are based on experiments dating back to the 1960s resulting in:

- 84kW/m² for residential, office and assembly & recreation uses
- 168kW/m² for shop & commercial, industrial and storage uses

When undertaking separation calculations, it is assumed that all unprotected areas (e.g. windows) are radiating with the applicable intensity listed above. The acceptance criterion for building separation distance is based on the radiation intensity that is experienced on the adjacent building, the incident radiation. This criterion was established based on experiments in the 1950s for piloted ignition of wood (piloted to account for the possibility of burning debris). The experiments concluded that the average value for critical radiation intensity was 12.6 kW/m².

In other words, building separation assessments comes down to making sure that the radiation intensity that is emitted from a fire compartment, is sufficiently reduced from 84 or 168 kW/m² to less than 12.6kW/m² before it reaches an adjacent building. This can be achieved in two ways; sufficient spatial separation between buildings, through the use of relevant boundaries, or by limiting the degree of unprotected area a building is allowed (or a combination of both).



What is a relevant boundary?

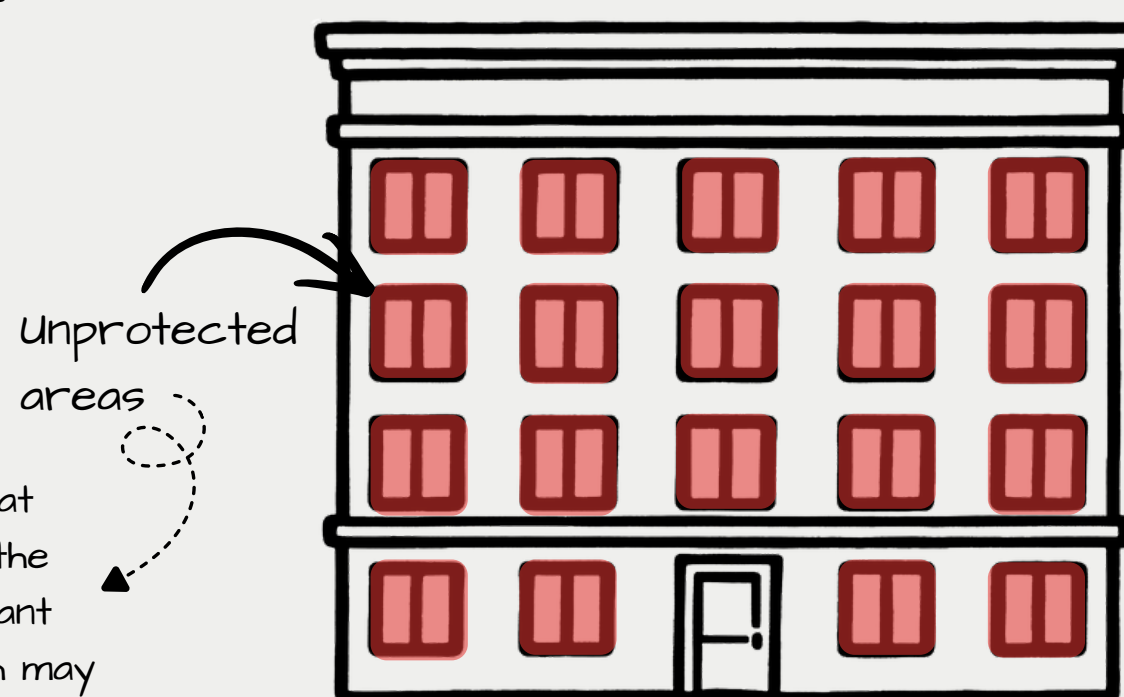
A building's relevant boundary can be a few different things. The default assumption is that the legal boundary for the site is also the building's relevant boundary, however, a few exceptions apply.

If an elevation is facing a public road (or canal, river or similar) the relevant boundary can be defined as halfway across the road rather than adhering to the legal site boundary. This is based on the assumption that it is highly unlikely that a public road is developed on, and that the buildings across the road are adhering to the same principle.



What is an unprotected area?

An unprotected area is any part of an elevation that does not meet the fire resistance requirements for the building (e.g. windows).

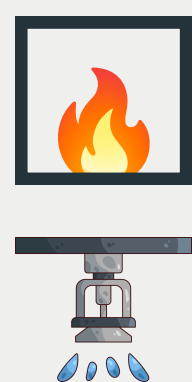


Note: This assumes that the solid portions of the wall achieve the relevant fire resistance, which may not always be the case

Impacts of compartmentation and sprinklers



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If a building is provided with compartment floors or walls, it can be assumed that a fire is contained to that floor / area only and it will therefore limit the radiating area that needs to be taken into account for building separation purposes.

The benefits of a sprinkler system are widely documented and include limiting fire spread (if not extinguishing it). This is reflected in standard guidance for space separation calculations in that for buildings provided with sprinklers, it is permitted to either:

- Half the required relevant boundary distance, or
- Double the amount of allowed unprotected area of the elevation

Spoiler: Part 2 of this Explained edition will explore the different calculation methods used when assessing building separation.