

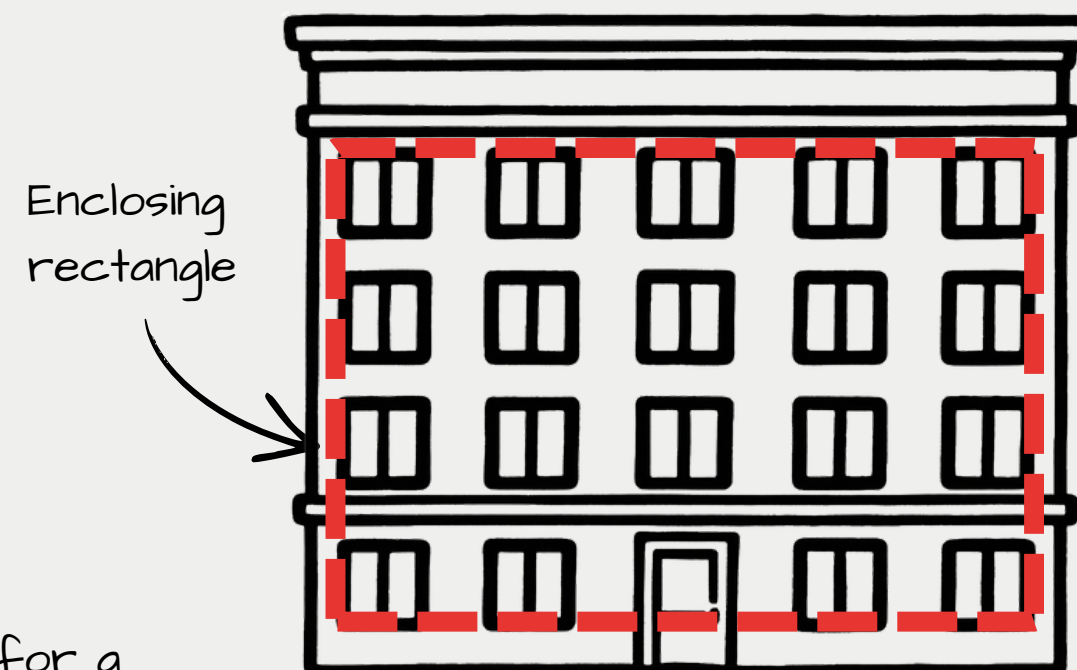
BUILDING SEPARATION EXPLAINED (PART 2)

In the previous edition of Explained we covered the principles behind building separation. We will now build on this and have a closer look at a few different calculation methods used in space separation analysis.

Enclosing rectangles

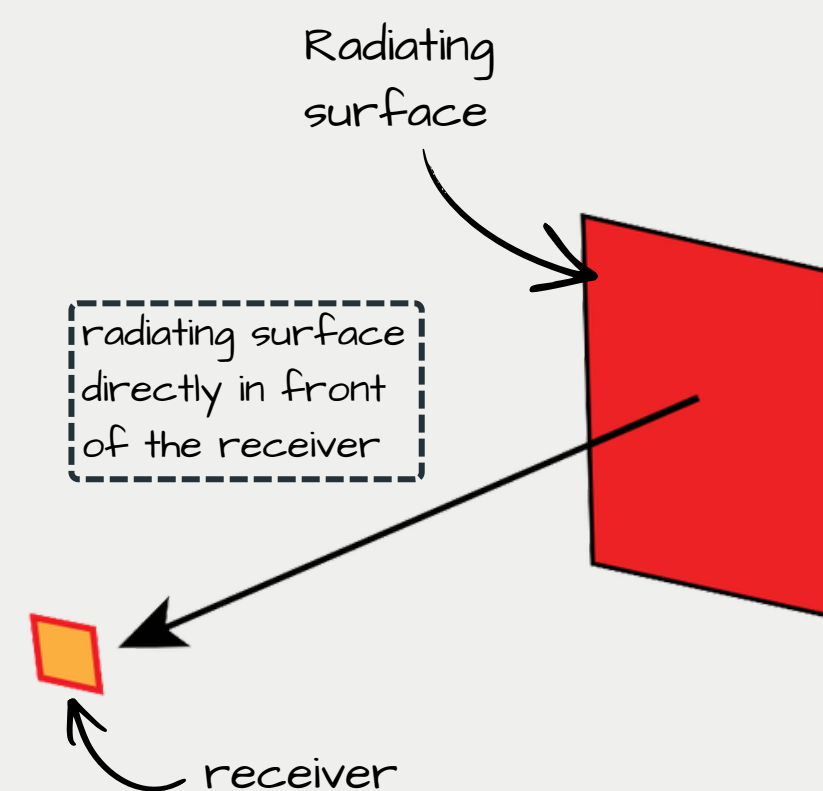
Enclosing rectangles is a method used as a simple geometric tool to calculate separation distances by replacing a building elevation with the smallest possible rectangle that contains all its unprotected areas. This enclosing rectangle is then treated as the effective radiating surface allowing engineers to apply standard separation formulas to a wide variety of buildings.

Tabulated data is then used for obtaining the required building separation distance for a specific proportion of unprotected area of the enclosing rectangle, or vice versa.



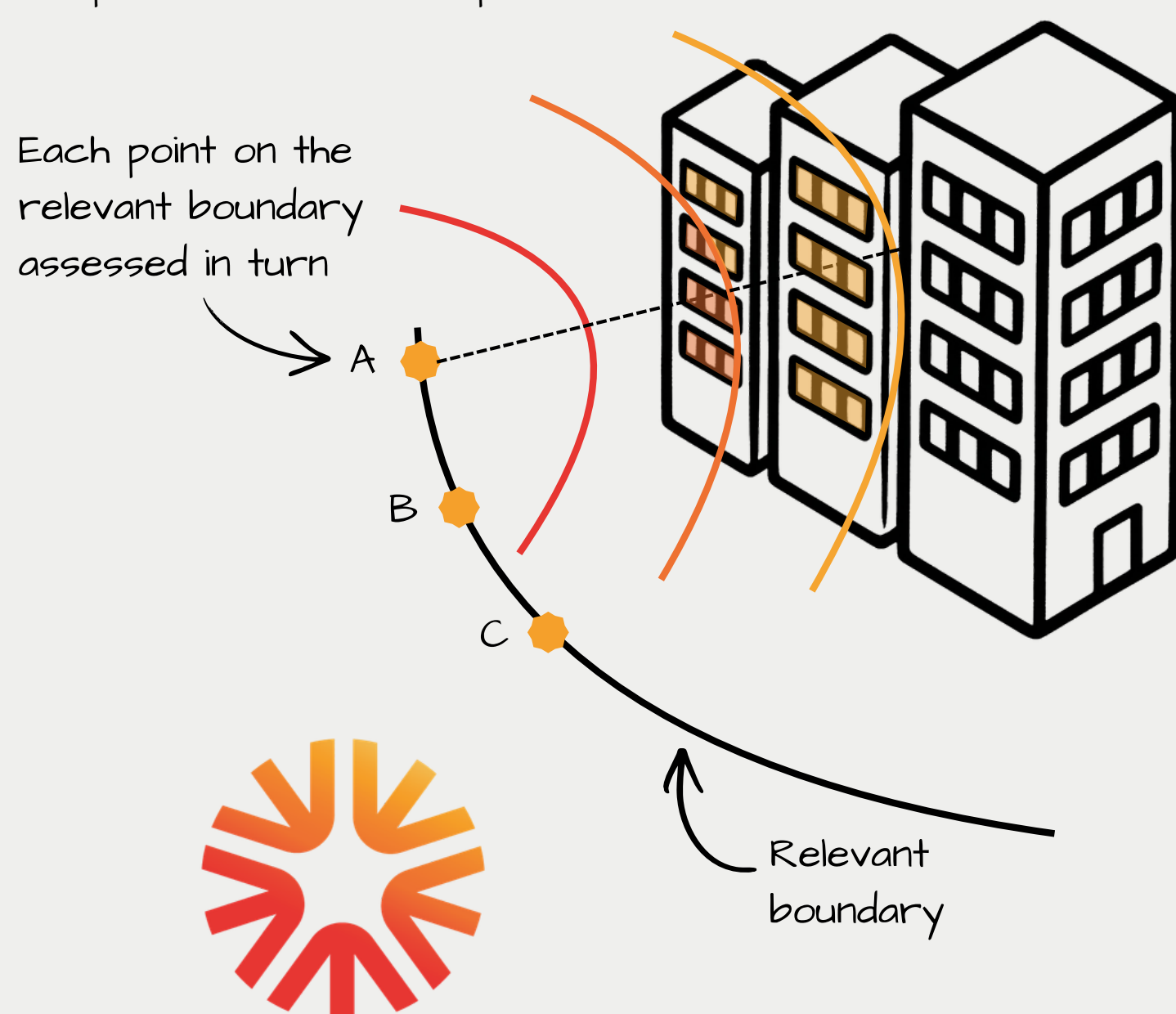
View factor (configuration factor)

The intensity of emitted radiation from a hot surface will decrease when the distance from the surface increases, the emitter is located at an angle or have a different relative size to the receiver. This is accounted for with the view factor, or configuration factor method. In the simple scenario of a radiating surface directly in front of the receiver, this factor is already included in the enclosing rectangle tabulated values. If this is not the case, additional calculations can be used to provide a more bespoke result.



Protractor method

If the distance to the relevant boundary varies along a particular building elevation, individual view factors could be calculated for each section of the elevation. However, this would be a very time-consuming exercise. An alternative method to approximate this is to use the aggregate notional area method, or protractor method. This is a method where different points on the relevant boundary are tested for proximity to the elevation and depending on the distance, a multiplication factor is introduced to the different sections of the elevation. If the total sum of the aggregate unprotected areas is less than 90m² or 210m² (depending on the building use), the boundary distance to this point is deemed acceptable.



Computer modelling

Computer modelling can also be used to assess thermal radiation for space separation analysis. This is more commonly used in complex situations or when it would be very time-consuming or labour intense to use other methods.



As with other fire engineering applications where computer modelling is used, it can be a very useful tool for engineers to support design decisions, however, it is vital that the engineer understands the assumptions, limitations and underlying inputs of the model.



MARS
FIRE ENGINEERING