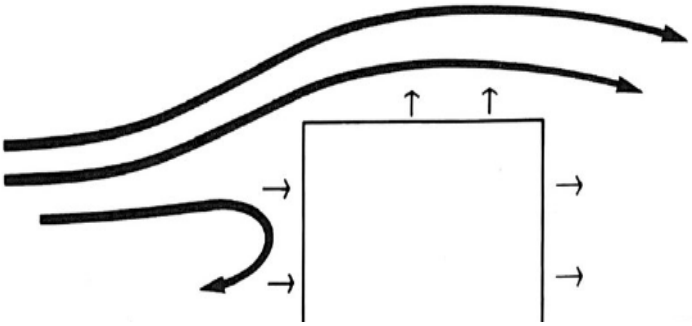
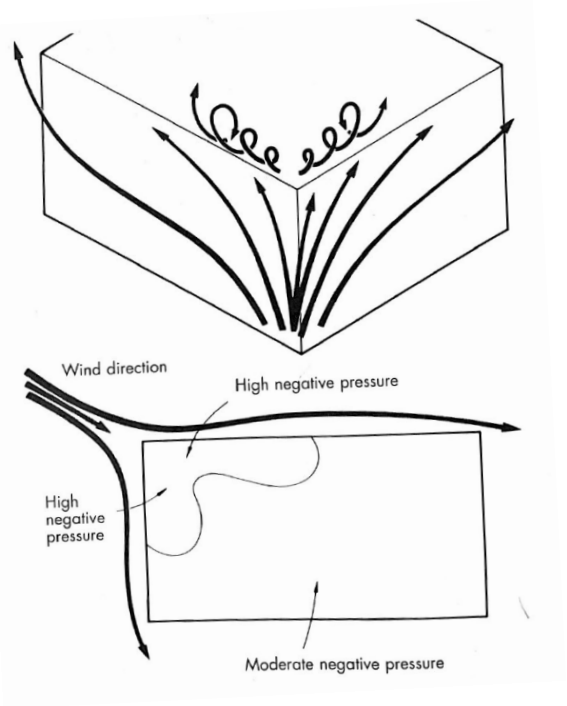
TGN 24.6 [Technical Guidance Note]
Bitumen Bonded Systems

When the wind strikes a building, it is deflected to generate a positive pressure on the windward face, and it accelerates round the side of the building and over the roof, leading to a reduced, or negative pressure over the roof and in the lee of the building.





Distribution of pressure over the roof is far from uniform, even for a simple square box structure. Wind does not normally strike square to the face of a building. When, as is more normal, it strikes at an oblique angle, the air deflected up and over the roof is at the same time moving along the face of the building, creating vortices along roof edges. The greatest wind pressures will be experienced at windward corners and edges of the roof, where the negative pressure can be several times that experienced in the central areas.

Numerous variables, including the building location, surrounding topography, roof height, roof size, roof shape/form, degree of slope will all have an impact. Because of this, it is imperative that a roofing system be designed and built to withstand the wind loads that are anticipated to be acting upon the roof during its service life.

The current standard for calculating wind loads is covered within Eurocode 1. Actions on structures – General actions – Wind actions BS EN 1991-1-4:2005+A1 2010 + UK National Annex.

According to British and EN industry standards for exposed roofing, hot bitumen when applied in a partial bond may withstand a maximum design load of up to 2.4kN/m^2, while bitumen applied in a full bond can be taken up to a maximum design load of 3.6kN/m^2 (figures taken from Annex A of BS 8217: 2005).

In designs with higher wind loads, supplementary mechanical fasteners or ballasting may be required to the localised wind zones, such as perimeters and corner zones.