

Building extensions, loft conversions and conservatories

► Location and position

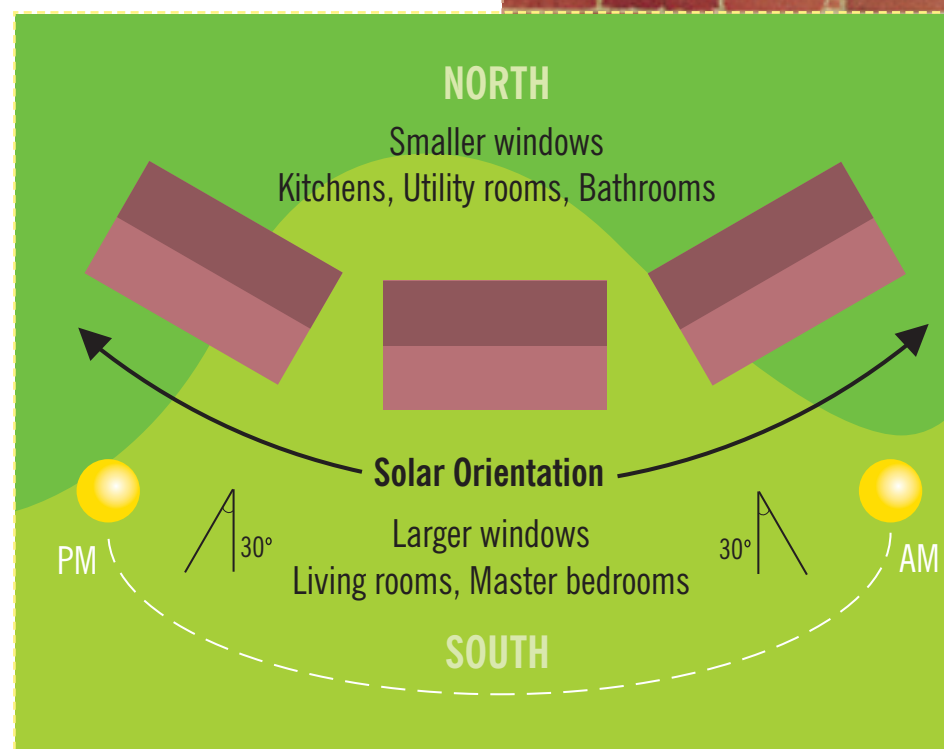
Before considering building an extension or converting your loft, check that you are using all your existing internal space. Look to see if there is any unused space within the confines of the existing walls that can be converted, or if there is a different way of creating storage that could make better use of space.

If you have made these checks and are still sure that you need to increase your accommodation without moving house, then there are environmental options you need to consider for an extension or loft conversion. It is important to note that Listed Buildings are subject to more stringent planning constraints.

Design considerations

Position extensions so that they do not cut out natural **sunlight** and **daylight** to the rest of the house or your neighbours' homes. This is an important issue for

planning permission, as are windows: they should not overlook neighbours' private facilities. The smaller the **external surface area** of a building, the less opportunity there is for heat to escape. The exposure of a building to the

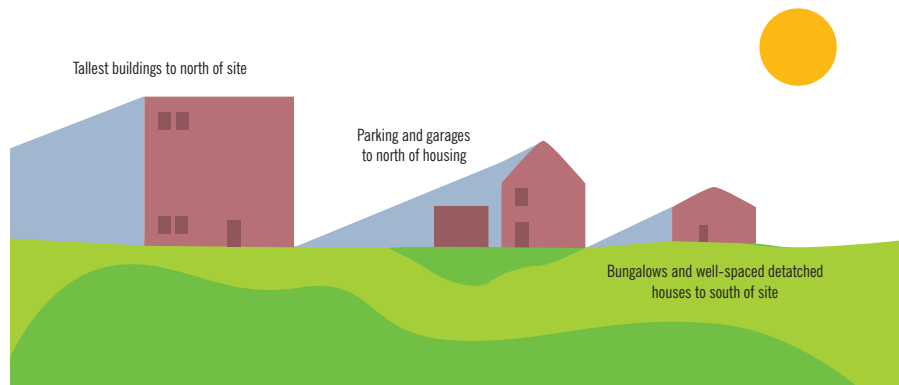


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external environment can be reduced by setting the building into the ground, or employing unheated intermediate spaces such as a conservatory, garage or lobby to act as thermal buffers for the main building.

Where possible use skylights and tall windows on the **south-facing** sides to bring more light and bring the free warmth from the sun into your loft or extension (passive solar energy). This will help to cut your fuel bills, especially in the winter. Let light in but stop the heat escaping by using **double-glazing** or low **emissivity double-glazing**. *See also [Windows, page 23](#).*

Where possible make any windows on the **north facing** sides smaller to keep out the cold northerly winds. (This may not always be possible, especially if your house is located in a conservation area or is a Listed Building.)



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Further advice on benefiting from 'passive solar energy' can be found in Woking Borough Council's guidance for Climate Neutral Development at www.woking.gov.uk/climatechange

Insulation

Use plenty of insulation in walls, roofs and floors. Going beyond the minimum requirements of the building regulations could mean that you won't need to install expensive heating in your extension or loft conversion. *See also [Insulation, page 26](#).*

Planting

New walls provide an opportunity to support climbing plants, or espaliered fruit trees that will shelter the structure of the wall from the weather and so reduce deterioration and the need for maintenance.

They also provide shelter from the direct effect of the sun on the wall in the summer and afford a small extra amount of insulation in the winter. Further details of designs for climbing plants can be found in the handbook 'Building Green' (*reference details on page 49*).

Green roofs or 'living roofs'

As well as increasing thermal insulation (and cooling in summer) green roofs store rainwater and help prevent overloading of stormwater drains and rivers.

They also offer a quiet habitat for wildlife – rare spiders and insects are often attracted to green roofs.

Further details of designs for roofs can be found in the handbook 'Building Green' (*reference details on page 49*) and visit www.livingroofs.org.uk for more information.



Photo credit: Rachel Coombes

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Making use of sunlight

Using passive solar energy (the energy provided by sunlight entering buildings through windows) can make a significant saving in energy needed for heating and lighting. This helps reduce the amount of CO₂ emitted by burning fossil carbon fuels. The amount of sunlight received through a window is influenced by several factors:

If suitably oriented, a **larger window** will allow more sunshine in. However, it will also allow more heat to be lost to the outside while increasing the likelihood of summer overheating. Major increases in glazed areas thus give diminishing returns unless the window is highly insulated.

Sloping a window towards the sun will increase the amount of radiation received. This effect is particularly noticeable in the summer, and explains why some loft conversions, conservatories and atria overheat.

Ventilation blinds and net curtains will reflect a proportion of the sunshine back to the outside, diminishing useful solar gain in winter. Careful planning and design of blinds can reduce the need for such screening and maximise the amount of solar light and heat. **External shades** such as sliding or pivoting shutters, or fixed louvres, can be used to moderate solar gain in summer and during the middle of the day.

In northern **latitudes** of the UK the sun passes lower in the southern sky than in the south. Solar radiation enters the atmosphere at a more oblique angle, and a greater proportion is absorbed or reflected before it reaches the surface. Regional variations in cloudiness also affect the availability of sunlight: the number of winter daylight hours available declines the further north one goes but the heating season, stretching into May, is longer and offers opportunities for solar heating at a time when the sun is getting stronger.

Using **double or triple glazing**, and glass that has been **coated** to limit solar gain or heat loss, will reduce the amount of sunshine and daylight passing through a window. However, this is offset by the improved heat insulation which these forms of glazing offer.

A high standard of **roof insulation** is one of the most cost-effective ways of saving energy. A roof can also be designed to incorporate solar panels or heat collectors, making further use of solar heat.

A southerly **orientation** maximises solar gain in the winter, and limits summer overheating because of the high angle of the midday sun.

As a regulator of daylight, sunlight and natural ventilation, the **design of a window** is of great importance. A window should have varying sizes of opening to allow ventilation to be varied without compromising security.

