4c) The role of sun spaces

Sun spaces
As the name suggests, in addition to extending living space, Sun spaces can greatly enhance use and enjoyment of the sun’s heat and light. Sun spaces can also assist with ventilation management. Sun spaces are best used as thermal buffers, serving as an intermediate space between indoor and outdoor environments.

Ideally, sun spaces face north and are free of overshadowing. The use of double glazing and insulation in the floor and side walls will assist in lengthening the time in the day and year in which the sun space will be comfortable.

High and low level opening vents and blinds need to be provided in the space to help repel excessive summer heat. Main building walls, windows and doors facing the sun space should be insulated to the same standard as any other part of the external building shell. This will help avoid summer overheating and winter heat-loss within the main building.

Roof insulation
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 and skylights, making further use of the sun’s energy.

Floors
Floors can be insulated to reduce internal heat loss, to assist in maintaining higher internal surface temperatures and to minimise draughts. Different types of floor construction require different insulating methods. Therefore, choice of construction and extent of insulation are important considerations.
Windows

Size:
Large windows placed on the side of a building orientated within the range which takes as full advantage of as possible the sun’s energy for heating and daylight (see Principle 2, page 3), will admit more sunshine to heat and light the building.

Large windows however, can provide diminishing returns as they allow heat to be lost to the outside if un-insulated. Windows may also increase the likelihood of summer overheating if inappropriately positioned.

Small windows placed on the eastern, western and southern facing elevations help to reduce potential summer overheating and loss of heat in winter. Insulating windows will further assist these aims.

Type of glazing:
The use of double glazing, or glass that has been coated to limit solar gain or heat loss, will reduce the amount of light passing through the windows. However this is offset by the improved heat insulation which these forms of glazing offer.

Frames:
The material of window frames has a large impact on heat loss through windows. Frames made of conductive material (e.g. Aluminum), transmit substantial amounts of heat out of the building. This is poor in terms of energy efficiency, increasing heating requirements, and therefore costs.

Energy efficient alternatives include timber frames and frames with thermal breaks. Initially these frames are more expensive than standard frames, but permanently reduced heating costs more than recover the cost in the medium to long term.

Window design:
The design of windows is very important to regulate the amount of sunlight, heat and cooling air entering buildings. Windows which allow the size of openings to be varied are the most effective.