



Guide to Sustainable Design

We believe in the fundamental importance of reducing the impact on the environment from construction. Our buildings are healthy to live in and kind to the environment. We implement all relevant energy saving measures where possible and welcome customers who are seeking to reduce their carbon footprint.

This document is intended as a guide to inform our clients of the energy efficiency principles, strategies and systems that we are able to implement.

The following is a check list of energy efficient measures and strategies that we would promote as current best practice energy efficient design:

Building form

- Orientate building and areas of glazing to maximise day lighting and potential solar gain and minimise heat loss. Generally speaking this means avoiding large areas of glazing on the north facade of the building and providing appropriate solar shading to the south, east and west facades.
- Locate openings to maximise passive ventilation. In reality this means placing windows to maximise cross ventilation across rooms where solar gain is a potential problem. Stack effect, vertical ventilation through stair voids or double height spaces can also be considered.
- Consider thermal mass as a method of stabilising internal temperatures. Materials such as brick, block work, stone and concrete absorb excess heat in warm weather and radiate heat in cooler weather, reducing net heating and cooling loads. Green roof systems provide excellent thermal mass and create micro habitats for wildlife.

Building fabric

- Super insulate. We would recommend improving levels of insulation to comply with energy saving trust best practice guidelines. Natural insulation materials such as hemp/cotton or sheep's wool are more sustainable, create a healthier internal environment and work more efficiently.
- Minimise thermal bridging, or heat loss through the building fabric. This can be achieved by enhanced construction detailing and through specifying high performance windows and doors.
- Minimise air infiltration losses, i.e. make the building as air tight as possible by sealing all potential air leakage routes. A controlled ventilation strategy must be implemented in conjunction with this approach. 'Build tight, ventilate right'.
- Ventilate efficiently. A comfortable internal environment should be possible to achieve through controlled ventilation via window trickle vents, passive stack vents and ideally, mechanical ventilation with heat recovery. Quite simply this is a system that extracts heat from warm damp air (kitchens and bathrooms) and re-circulates it in the form of dry warm air to reduce net heating loads.
- Use natural or recycled materials where possible, using the Green Guide as a source for specifications. Examples include sustainable timbers, low voc paints and breathable materials for historic buildings, such as lime based renders. Detail construction so that materials can be recycled.

Building systems

- Use high efficiency heating systems with full controls. Ensure that all installations are fully lagged and that pipe runs are minimised. Consider alternative fuel sources, such as biomass boilers. Specify twin coil cylinders to be compatible with renewable energy inputs such as solar thermal heating and ground source heat pumps.
- Reduce the energy load through efficient lighting design and the use of A rated appliances. Good day lighting, low energy light fittings and 2 way switching should be implemented as standard.
- Consider using under floor heating. Water based systems are especially efficient if used in conjunction with solar thermal heating and/or ground source heat pumps.
- Consider installing a ground source heat pump. This is a system that involves circulating water through pipes laid horizontally in the ground or vertically in a bore hole, to extract the latent heat from the earth, before you use it.
- Consider solar thermal heating. Solar panels or tubes on the roof space collect radiated heat from the sun and use it to heat domestic hot water. The systems provide about a third of your hot water needs.
- Consider photovoltaic's, solar panels which harness energy from the sun, converting it to electricity. These can be grid connected, allowing you to sell surplus electricity back to the energy companies.
- Consider installing a rain water harvesting system to supply grey water needs (toilet flushing) or for garden irrigation purposes.

The following links and references are useful sources for further information:

- www.energysavingtrust.org.uk Advisory body and author of best practice construction guides.
- www.biggreenswitch.co.uk Advice on adopting a greener lifestyle
- www.lowcarbonbuildings.org.uk Advice about low carbon building technologies and grants
- www.ecomerchant.co.uk Supplier of environmental products
- www.ecobuild.co.uk Worlds biggest event dedicated to sustainable design.
- www.livingroofs.org Independent site promoting green roofs