

Sustainable design and construction



Sustainable building, Foyer (part funded by Salisbury District Council).

Sustainability is about the responsible use of scarce resources, taking into account the legacy left to future generations. It is widely recognised that, in environmental terms, current generations are living beyond their means.

The UK government advocates the following sustainable development objectives:

- social progress which recognises the needs of everyone
- effective protection of the environment
- prudent use of natural resources
- maintenance of high economic growth and employment

By designing buildings that minimise energy consumption, are built from renewable materials and make efforts to reduce wastage, we can all contribute to reducing environmental pollution and saving natural resources while also benefiting the homeowner by reducing fuel bills.

Various accreditation schemes are now available to rate the eco-performance of new and refurbished buildings. Salisbury District Council supports the Building Research Establishment (BRE's) Environmental Assessment Method and encourages all new residential development to meet at least the Building Research Establishment (BRE's) "Good" Eco Home rating.

What can be done to make a new building Sustainable?

There are a number of ways in which new buildings can be designed so that they are more environmentally friendly. In particular the following areas should be considered at the outset of designing any new development:

Making Best Use of Energy

Ask yourself whether the building you are designing is going to be as energy efficient as possible. As well as meeting Government and local planning policies and thereby raising the chances of planning permission being granted, it is also an attractive selling point in that prospective purchasers will have reduced fuel bills. There are a number of ways to maximise energy efficiency in a new design and these include the following:

- Ensuring excellent insulation from all aspects of the building, including the roof, walls and floor as well as effective draft exclusion from windows and doors are effective ways of minimising heat loss and reducing energy use that can be designed in from the very start.
- Choosing a location within the wider site that has the most natural shelter and offers the most prolonged periods of sunlight, thereby reducing heat loss and maximising natural warmth.
- Timers, thermostats and computer controlled systems which control heat, light and hot water are all ways to maximise energy efficiency, through the best use of resources. Again these systems can be designed in from the outset of the process.

Using the Sun



Solar panels and grass roof are used to utilise the sun's energy and provide natural insulation

Often known as "passive solar design" this involves taking advantage of the natural light and heat from the sun and using air movement for ventilation. If well designed, such an approach can significantly reduce the need for artificial light, heat, cooling or ventilation. In order to try and maximise the sun's energy the following approaches should be considered at the design stage of any plans:

- Layouts that maximise east-west building alignments and orientate most of the glazing due south
- Layouts designed to avoid overshadowing adjacent buildings, through built form or poorly thought out planting schemes
- Locating car parking where possible to the north of housing
- Locating taller buildings to the north of the site
- Using buildings and planting to act as shelter and avoiding wind-tunnel effects.

Renewable Energy

Planning Policy Statement 22 (Renewable Energy) encourages the integration of renewable energy technologies into new and refurbished development wherever possible. Renewable energy which can be generated on-site and technologies such as solar panels, photovoltaic roof tiles, wood-fuel heaters, and small-scale wind turbines will be encouraged in new developments. The costs of such technology are not necessarily prohibitive and will help to significantly reduce energy-costs throughout the life-time of the building. Government grant schemes are also available for qualifying developments. Further information can be obtained from the Energy Saving Trust (www.est.co.uk).

Which Materials to Choose

The choice of the materials and where you purchase them can make an important contribution to achieving an environmentally friendly design solution. Salisbury District Council will be looking for evidence of the following in planning applications:

- Where site clearance or demolition is involved, where possible and appropriate, materials should be salvaged and re-used in the new building.
- Use of materials that are from renewable sources.
- Use of materials that are sourced locally to minimise transportation and benefit the local economy.
- Use of materials where the lifespan of the product and energy input into production has been assessed.

Encouraging Recycling & Composting

All new development should have facilities that allow its occupiers to have ready access to recycling facilities in order to encourage the sensible disposal of household and office waste such as paper, tin cans, organic material etc. A well designed building will include dedicated space and facilities for separating waste, composting and storing recyclable materials. Applications for larger developments (e.g. more than 9 dwellings or 1000m² floor-space) will require a Waste Audit in line with Wiltshire County Council's Waste Supplementary Planning Guidance.

Designing for the future re-use of the building

Simply designing a new building that will need to be demolished at the end of its functional life and then replaced by a new one is not a sustainable solution. Buildings should be designed to be flexible and capable of different uses. Many of our historic buildings have been used for a number of purposes such as the conversion of residential units to offices and even churches to Arts Centres as has been done in Salisbury. This demonstrates that a well-designed building can stand the test of time and be adapted to different uses as required.

The following areas should be considered when designing a new building:

- Use of non-load bearing partitions to allow for easier internal adaptation in the future
- Ceiling heights that are sufficient to incorporate changes in room use
- Redundant buildings should be considered as a valuable resource and should be re-used where possible.

Transport and travel

Use of the private motorcar is a significant cause of environmental pollution and hence new buildings will be expected to make a contribution to providing alternative choices to the occupiers. Especially when designing new housing or employment uses, it should be clearly explained how the occupiers will have a range of

options such as walking, cycling and public transport as opposed to total reliance on the car. New development should therefore be designed to take account the following:

- Locating near existing facilities and service centres removing the need for long trips
- Integration of existing public transport routes or facilitation of new routes and stops
- Integration of cycle and footpath networks to include new stretches of paths where necessary

It may be appropriate to provide a Travel Plan as part of your supporting information to explain how you will encourage people to walk, cycle and use public transport. Reference should be made to the Salisbury Transport Plan (www.salisbury.gov.uk/transport).

Drainage

No new buildings can be developed without taking into account the need for water and drainage. Additionally, by increasing the areas of ground covered by hard surfaces including the building's footprint, service roads, driveways, parking areas paths and patios, new development will alter the patterns of surface water drainage.

In transferring water quickly away from the developed area there is increased risk of introducing flooding to other parts of the catchment. Furthermore, such an approach can introduce pollutants from urban environments into rivers.

Rather than simply getting wastewater off site and forgetting about it, Sustainable Drainage Systems (SUDS) should be employed wherever possible.

The aim of SUDS is to manage surface water flows, return runoff into the ground as close to source as possible and to protect water quality and hence environmental setting and wildlife habitat.

SUDS comprises a range of structures designed to manage surface water runoff, which can be incorporated into initial designs on a flexible basis to address individual site circumstances. The general methods of control include:

- Filter strips and swales;
- Filter drains and permeable surfaces;
- Infiltration devices (soakaways);
- Basins, ponds and wetlands; and
- Use of natural processes of sedimentation, filtration, absorption and biological degradation to treat pollutants.

Whilst there will be locations where it is not appropriate, possibly because of the previous uses of brownfield sites, SUDS can be designed to fit almost all urban setting and therefore all future development proposals have the opportunity to incorporate sustainable drainage principles.

To ensure that SuDS operate successfully, suitable arrangement need to be in place for long-term maintenance. Further information can be obtained in the interim Code of Practice for Sustainable Drainage Systems, Published by the National SuDS working Group in July 2004.

Further advice upon the applicability of SUDS to individual sites may be obtained from The Environment Agency, Rivers House, Higher Sunrise Business Park, Blandford, Dorset DT11 8ST, Telephone 01258 483 390 (www.environment-agency.gov.uk).

The use of water

New development adds pressure to the supply of water, a finite resource which should be protected. Abstraction from the River Avon SAC/SSSI is an important issue and therefore it is essential that developments incorporate water saving measures to reduce impacts on nature conservation. Thoughtful design of new and refurbished buildings integrating, for example, water-saving taps, dual flush toilet cisterns and flow restrictors for showers, can significantly help reduce water wastage. Furthermore, waste water or "grey-water" can be collected and reused on-site for toilet-flush etc. Collecting rainwater in water butts for garden areas is another easy way to make your development more environmentally friendly.

A Checklist For Achieving a Sustainable Design

There is a lot to remember and in order to help those of you wishing to produce a new design we have produced the following checklist, which will help ensure you have adequately addressed the main issues.

Salisbury District Council places such importance on achieving patterns of sustainable development that it is essential that planning applications for new buildings, or conversion of existing ones, must clearly demonstrate that the checklist has been fulfilled.

Objective 6

Checklist For Achieving Sustainable Design

In designing your new building have you taken into account the following requirements and explained how you have done so in your design statement?

- Has the lifespan, and energy required to produce the materials been assessed? (some materials are more energy-hungry than others!)
- Do the raw materials come from renewable sources e.g. timber from sustainable forests?
- Will any materials be locally sourced to minimise transportation and support the local economy?
- Does the design make use of reclaimed or recycled materials either from this site or another?
- Have the buildings been designed to maximise the benefits of natural energy from the sun?
- What energy saving features and insulation are proposed?
- Have the buildings been designed to be adaptable for future changes of use?
- Will people be easily able to travel to and from the building on foot, by bike and by public transport?
- Does the proposal include Sustainable Drainage solutions and does it reduce water wastage?
- Does your proposal encourage the recycling and composting of waste?
- Are there existing buildings on the site that could be re-used?

Note:

Additionally, the Council has produced supplementary planning guidance on achieving sustainable development, including a simple assessment method to help you consider the issues. This is available from the Planning Offices and on-line (www.salisbury.gov.uk/planning/forward-planning/sustainable-development).