

## SUSTAINABLE DESIGN AND CONSTRUCTION GUIDE

Sustainable design and construction is a way of building, which is more environmentally friendly than standard construction. This is because the methods and materials that are used make more efficient use of resources and result in a need for less energy. The building may also be cheaper to run and healthier to live in than a standard building.

North Devon District Council is committed to raising the standards of new development and to encourage others to build using sustainable techniques. Sustainably constructed buildings, which go further than the standards set out in the Building Regulations and which recognise the quality standards expected in future legislation.

The following is intended to act as an initial 'checklist' for developers and other applicants for planning permission. The guidance will also be used by the Council's Planning and Development Service in assessing the green credentials of proposed development schemes and, in particular, compliance with the adopted policies of the North Devon Local Plan noted below.

Additional guidance on the relevant information required to accompany planning applications is set out in the Council's Planning Application Validation Checklist available on-line on [http://www.northdevon.gov.uk/07-02-26\\_-\\_validation\\_checklist\\_-\\_final\\_version\\_-\\_whole\\_-\\_1-0a.pdf](http://www.northdevon.gov.uk/07-02-26_-_validation_checklist_-_final_version_-_whole_-_1-0a.pdf).

### **1. Promoting energy efficiency in accordance with Policy DVS1A.**

The Developer should set out to achieve a particular BREEAM or Code for Sustainable Homes standard and how it is to be achieved. Development exceeding 1000 m<sup>2</sup> or 50 dwellings should achieve a rating of at least 'Good' and this rating to be exceeded wherever possible. Specific measures used to exceed minimum energy efficiency requirements, as set out in building regulations should be demonstrated.

- ◆ Address orientation and layout to maximise solar gain and natural lighting. This includes the appropriate use of glazing, dormer windows, sunpipes and conservatories.
- ◆ Airtightness should be maximised and natural methods of ventilation and cooling adopted. <http://www.bre.co.uk/housing/section.jsp?sid=377>
- ◆ Insulation levels of roofs, floors and walls should be maximised, and opportunities for increased thermal mass integrated wherever possible <http://www.energysavingtrust.org.uk/uploads/documents/housingbuildings/CE71%20-%20Insulation%20materials%20chart.pdf>.
- ◆ Windows should have a good solar heat-gain coefficient, low-emissivity coatings, argon or krypton gas fill, with insulating glass spacers. Solar shading should be used to reduce over-heating while allowing natural light to enter.
- ◆ Fixtures, fittings and lighting fitted as standard should be low energy A-rated appliances with automatic on/off switching systems and intensity controls used wherever appropriate, i.e. communal areas and walkways.
- ◆ A-rated energy efficient condensing boilers and white goods should be used wherever possible.

- ◆ Energy use through external lighting should be minimised through the use of high-pressure sodium units, movement detection control and daylight cut-off sensors.
- ◆ Minimisation of energy use in machinery and IT equipment through energy-saving technology.
- ◆ Direct sub-metering of substantive energy uses within buildings should be specified, with separate sub-metering of self contained apartments and units where necessary.
- ◆ Areas for drying space should be provided internally and externally as appropriate.
- ◆ Take account of micro-climatic factors and wind shelterbelts through appropriate built form. Landscaping and planting can be used to prevent overheating in summer while allowing maximum light exposure in winter.
- ◆ Consider whether the overshadowing impact of trees, other buildings, walls and fences would be adverse or beneficial.

## **2. Promoting sustainable transport choices in the form of walking, cycling and public transport in accordance with Policy TRA1A.**

- ◆ A 'Transport Statement' or assessment should be provided outlining how the effects of increased transport have been mitigated by the site design and layout.
- ◆ Parking provision should be appropriate (1.5 spaces per dwelling) to reduce the level of car parking in new development and promote alternative sustainable transport choices.
- ◆ Safe and secure walking and cycling routes both through the site and to the nearest town should be provided. These should be integrated with existing routes to allow access to all local amenities.
- ◆ Ensure public transport is an attractive and viable option for residents and workers to access employment and service facilities.
- ◆ Cycle storage should be adequately sized, safe, secure, convenient and weatherproof.

## **3. Increasing safety and reducing the risk of crime through appropriate design and layout in accordance with Policy DVS1.**

- ◆ The design should consider the principles set out in the Devon & Cornwall Police initiative <http://www.securedbydesign.com/>.
- ◆ External lighting should be sufficient to facilitate safe access, reducing opportunities for crime but appropriately designed to avoid excess light and wasted energy.

## **4. Minimising the consumption and discharge of water and sewage by promoting the management and recycling of water and use of Sustainable Urban Drainage Systems in accordance with Policy DVS7.**

- ◆ Demonstrate how water demand and consumption is being reduced to a level below the average 120 litres per person per day, e.g. water meters.
- ◆ Provision of water butts throughout the site should be incorporated to promote rainwater storage and recycling.

- ◆ Water efficient services in bathrooms and kitchens would be expected in all properties, such as dual-flush toilets, spray taps, low-flow showers and instant hot water systems.
- ◆ Consideration should be given to discouraging the use of paved areas and replacing with a porous material (SUDS) such as grass-crete or gravel to facilitate draining surface water.
- ◆ Run-off from roofs should be collected in water butts or directed to a local soakaway or other holding facility such as tanks, ponds or swales.
- ◆ Consideration should be given to introducing grey water / rain water-harvesting system. This would enable grey water and water captured through SUDS to be stored, pumped into the development and used for flushing toilets, washing clothes and watering gardens. This could be provided for individual properties or on a community basis.
- ◆ Further guidance is available from the EA [http://www.environment-agency.gov.uk/commondata/acrobat/a5\\_suds\\_v3.pdf](http://www.environment-agency.gov.uk/commondata/acrobat/a5_suds_v3.pdf) and Defra [http://www.ciria.org/suds/pdf/nswg\\_icop\\_for\\_suds\\_0704.pdf](http://www.ciria.org/suds/pdf/nswg_icop_for_suds_0704.pdf).

#### **5. Maximising the efficient use of land and buildings in accordance with Policy HSG5.**

- ◆ Explain clearly how the development will maximise the opportunities and overcome the constraints of the site and its surroundings.
- ◆ Higher densities could not be accommodated satisfactorily by a more effective layout of the site?
- ◆ Appropriate archaeological and historic appraisals of the site should be carried out to enhance the future design.

#### **6. Reducing the use of fossil fuels by incorporating renewable energy, heating or power systems in new major developments in accordance with Policy ECN15.**

- ◆ At least 15% of predicted energy requirements should be provided by independent onsite renewable energy generation for major commercial proposals above 1,000 m<sup>2</sup> gross and/or residential developments of at least 20 dwellings.
- ◆ Seeking to minimise energy consumption, maximising solar gain and complying with current building regulations is not sufficient.
- ◆ Active solar heating is currently one of the most efficient and cost effective technologies available. Implementation at the design stage allows it to be partnered with under floor heating, which runs at lower temperatures than radiators hence providing subsequent energy savings.
- ◆ Wind power, solar photovoltaic, ground source heat pumps and biomass boilers provide a range of opportunities for generation in many situations.
- ◆ It should be evident that a range of micro-renewable technologies has been considered including community heating and Biomass Combined Heat and Power. Information on the Biomass supply chain in the Southwest can be found at <http://www.swwf.info/>.
- ◆ Sustainable design consultants <http://www.swenvision.org.uk/> provide help and support to small to medium size businesses in the Southwest through environmental support.

- ◆ Free independent advice and support identifying renewable energy options, assessing technologies and installers, and accessing grants and loans is available through <http://www.re4d.org/>.
- ◆ To be eligible to receive a low carbon buildings grant you must use a DTI accredited installer and an accredited product <http://www.lowcarbonbuildings.org.uk/micro/>.

**7. Minimising waste by providing appropriate facilities for the reuse and recycling of materials including composting in accordance with the Devon Waste Local Plan.**

- ◆ Provision of any refuse bin store within the development's standard design should allow for the wheelie bin and green box system incorporated within NDDC.
- ◆ Measures should be included within each property such as split bin storage for rubbish and composting together with a dry recycling area.
- ◆ The developer should also consider individual and/or communal composting facilities.
- ◆ Further guidance is provided in NDDC's Design Guide on Refuse Storage for New Residential

**8. Promoting health and wellbeing through the design and operation of buildings and ensure they are capable of being adapted to meet changing lifestyles.**

- ◆ The design of the building should take into account the potential impact of climate change, e.g. flooding, subsidence, driven rain, wind exposure, solar gain and UV exposure.
- ◆ Accessibility should be encouraged throughout all developments according to the principles of <http://www.lifetimehomes.org.uk/>.
- ◆ Alleviation of health problems such as asthma and allergies through the consideration of non-toxic and healthy products beyond that required by Construction Design and Management.
- ◆ Products such as breathable paints and natural insulation materials also provide for greater levels of recycling at end of life cycle.
- ◆ Provision of suitable ventilation is essential particularly in areas of extensive double-glazing. The windows in all buildings should be designed to be openable.
- ◆ Flexible buildings providing work space within dwellings and ICT links.
- ◆ Outdoor space that provides at least partially private areas should be provided in all dwellings where appropriate.
- ◆ A strategy to minimise noise during construction and ongoing use should be adopted.
- ◆ Control over the temperature and humidity of all developments should be adjustable, simply, without overcomplicated controls and with guidance provided.
- ◆ Sufficient passive heating and insulation to minimise fuel poverty.

**9. Ensuring important natural features and the biodiversity of an area are protected during construction in accordance with Policies ENV8 and ENV12.**

- ◆ Look for opportunities to provide, protect and enhance habitats and Biodiversity Network features, particularly for native species of flora and fauna.  
[http://www.northdevon.gov.uk/index/lqcl\\_leisure\\_and\\_culture/lqcl\\_parks\\_and\\_recreation/lqcl\\_countryside/nonlqcl\\_natures\\_space\\_biodiversity\\_action\\_plans.htm](http://www.northdevon.gov.uk/index/lqcl_leisure_and_culture/lqcl_parks_and_recreation/lqcl_countryside/nonlqcl_natures_space_biodiversity_action_plans.htm)
- ◆ Whenever trees or hedges are on or adjacent to a proposed development site details must be submitted in accordance with "*BS5837:2005 Trees in relation to construction*". Details should include a tree survey and tree constraints plan (TCP), arboricultural method statements (AMS) and a tree protection plan (TPP)
- ◆ Development of a full Biodiversity Management Plan should be considered.
- ◆ Retain and enhance existing hedgerows with boundary planting.

#### **10. Maximising the reuse of previously developed land and existing buildings in accordance with Policy HSG1**

- ◆ Make the best use of space and efficient use of land, including adequate density and prioritising brownfield land, land with low ecological value and underused buildings.
- ◆ Re-use existing building assets – use the surroundings and re-use materials already on site.
- ◆ Consider the effect that removing or changing existing buildings on site may have on the local character.

#### **11. Minimising the generation of waste through its reuse and recycling during demolition and construction in accordance with the Devon Waste Local Plan.**

- ◆ Developers should be encouraged to formulate a 'Site Waste Management Plan' (SWMP) as the emphasis is not just on land assembly waste but also minimising and recycling construction waste. This is due to become a legal requirement towards the end of 2007.
- ◆ To aid in the implementation of SWMPs Devon County Council has produced 'Waste Audit Statements - Guidance Notes', which can be found at <http://www.devon.gov.uk/wasteaudit.pdf>. Development design should incorporate waste volume estimations, procedures to reduce, re-use and recycle waste, steps to increase construction efficiency and the proposed methods of transporting unavoidable waste.
- ◆ Design for 'lean' construction – avoid ordering and using more materials than you need.
- ◆ Use of waste trading sites such as <http://www.nisp.org.uk> should be encouraged in line with any SWMP.
- ◆ <http://www.wrap.org.uk/construction/index.html> and <http://www.smartwaste.co.uk/about.jsp> offer guidance and tools for minimising waste, reducing costs and maximising resources.
- ◆ Plan for soil protection during development, so that topsoil is conserved and subsoil is not compacted, disturbed or drained causing problems later on.

#### **12. Using locally sourced and sustainable materials and low embodied energy products wherever possible.**

- ◆ An Environmental Profile summary outlining the percentage of locally sourced, sustainable and recycled materials to be used in the proposed development should be provided <http://www.bre.co.uk/page.jsp?id=53>.
- ◆ This should also include a list of likely sources of materials, particularly those that may not be deemed local or sustainable.
- ◆ Use of sustainable <http://www.fsc-uk.org/> and locally sourced timber <http://www.southwestforest.org.uk/> which has been responsibly managed and harvested.
- ◆ Use of Modern Methods of Construction (MMC) to be used onsite should be detailed <http://www.bre.co.uk/page.jsp?id=317>. This includes off-site manufactured and prefabricated materials which reduce on-site construction times, waste and energy use and result in improved BREEAM ratings.
- Innovative and natural materials such as green and natural roofs, green oak cladding, timber floor boards, clay quarry tiles, locally sourced facing stone, recycled newspaper insulation (cellulose fibre), organic paints, waxes and stains (specified so as to be low in Volatile Organic Compounds), sustainably sourced timber and careful product selection to avoid the use of PVC (for example, LSF electrical cabling, clay underground pipe-work, ABS water pipes, timber fascias, soffits and barge boards, timber windows and doors).
- ◆ Local operatives should be used and encouraged to register with the Construction Skills Certification Scheme. The income, skill levels and employability of local people is improved while the community benefits from a sense of local ownership and stimulated economy.
- ◆ BE AWARE is a industry focused project to help construction product manufacturers and the supply chain make more efficient use of materials and processes by investigating their product's design, manufacture, installation, use and disposal. <http://www.bre.co.uk/page.jsp?id=707>
- Ecologically sound materials include those with low environmental Impact (for example, those A+ rated by BRE's Green Guide to Specification), are low in embodied energy, are from sustainable sources and are locally sourced wherever possible <http://www.bre.co.uk/greenguide/page.jsp?sid=435>.
- In contrast to environmentally friendly materials with high-embodied energy include aluminium, lead and other heavy metals, petrochemical bases paints and stains, concrete/cement and plastics.

*The above guidance will be subject to ammendments based on changing legislation and technological advances.*

### **Current References**

[http://www.planningportal.gov.uk/uploads/code\\_for\\_sustainable\\_homes\\_techguide.pdf](http://www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf)

<http://www.futurefoundations.co.uk/charter.php>

<http://www.checklistswest.co.uk/>

**Draft Sustainable Design Guide, NDDC, 2006**