SUSTAINABILITY MANUAL

Summary Document: Finalised Draft

Technology Guide – Review of Technologies and Approaches for New Development

March 2010

1.0 Introduction

1.1 The Technology Guide is intended to provide those submitting and assessing planning applications to/for West Northamptonshire Development Corporation with a reference tool that allows the suitability of sustainable development technology options, and more general design principles, to be identified by the type and scale of development proposed. As well as representing a useful reference tool, the Guide should be read alongside the WNDC Sustainable Development Policy Guidance (SDPG) document that in combination form the background documents to the WNDC Sustainability Manual Framework Document that will be used by WNDC to inform development control decisions.

1.2 The Technology Guide is split in to a series of sections that enable the reader, be it those submitting or determining planning applications, to quickly identify the likely appropriateness of different sustainable development technology options by type and size of proposed development, and to understand the sustainability benchmarking methods that will be used to assess applications in accordance the Sustainability Manual Framework Document. The Guide also reviews low and zero carbon technology options at the strategic scale, identifying in broad terms those likely to be most feasible within West Northamptonshire and through a review of exemplar schemes, demonstrates the practical application of these technologies.

1.3 The following sections of this summary document outline these benchmarking methods and general findings in respect of the technology options.

2.0 Benchmarking Methods

2.1 Four types of benchmarking and assessment schemes are identified in the Document –

- Code for Sustainable Homes;
- Building Research Establishment Environmental Assessment Method (BREEAM);
- PassivHaus; and
- Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL).

Code for Sustainable Homes (CSH)

2.2 The CSH was introduced in England in 2007 and is an environmental assessment system for new housing. The Code awards a rating to each dwelling on a scale of Level 1-6 (1 being lowest and 6 the highest) referenced against the Target Energy Ratings contained in the 2006 Building Regulations. In general, credits are awarded against nine criteria (Energy/CO_2, Water, Materials, Surface Water Run-off, Waste, Pollution, Health and Wellbeing, Management and Ecology) to determine the Code Level achieved.

Building Research Establishment Environmental Assessment Method (BREEAM)

2.3 BREEAM is an environmental assessment method for non-domestic buildings. As with the CSH, BREEAM measures buildings against a range of factors, awarding credits against performance which then determine the given rating of the building. Buildings can be rated as:

- Unclassified
- Pass
- Good
- Very Good
- Excellent
- Outstanding

2.4 BREEAM encompasses a range of assessment methods that vary with the type of building concerned. It is, therefore, a highly focused assessment method.

PassivHaus

2.5 PassivHaus is a voluntary, low energy building standard that focuses on reducing the energy demand of residential buildings through passive measures, such as layout, insulation, and air tightness. The standard is achieved where targets for energy demand and the primary energy use of appliances are met.

Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL)

2.6 CEEQUAL provides a methodology to assess the sustainability of infrastructure projects in a similar manner to BREEAM does for other forms of building. The approach assesses a range of environmental and social consequences arising from development and awards schemes a Pass, Good, Very Good or Excellent rating depending on compliance with the sustainability criteria.

3.0 Technology Options

3.1 The main part of the document reviews technologies and approaches that are appropriate to address key principles of Sustainable Design and Construction and is structured to be closely aligned to the factors identified in the benchmarking methods, particularly the CSH and BREEAM. Accordingly, a range of Sustainable Design and Construction issues are highlighted under the following sub-headings:

- Passive Design
- Energy Efficiency
- Low & Zero Carbon Energy

- Water and Drainage
- Materials
- Waste and Recycling
- Pollution
- Health and Wellbeing
- Transport
- Landuse and Ecology
- Construction Management

3.2 These are summarised in the following paragraphs.

Passive Design

3.3 Passive Design involves consideration of the built form and its relationship with natural forces and seeks to reduce energy demands as far as possible before using more active technologies. Thus factors such as orientation, building shape, landscaping and thermal mass should all be considered at the conceptual design stage to influence, and minimise, future energy demands arising from the development. Passive design approaches should be incorporated in all types and scale of development. In addition to the Technology Guide, reference should also be made to the WNDC Manual for Design Codes which includes further information on Passive Design.

Energy Efficiency

3.4 Once passive design measures have been fully investigated, energy demands should be reduced as much as possible and the efficiency of plant and controls optimised. Key issues to consider include insulation and thermal bridging, air permeability and building services (such as lighting, lighting controls, ventilation systems, boilers, comfort cooling and inverters. These technologies and approaches are capable of being incorporated in to most types and scale of development.

Low and Zero Carbon Energy

3.5 Given national targets in respect of reducing CO_2 emissions, low and zero carbon technologies offer the potential to make a significant contribution. Such technologies include Combined Heat and Power (CHP) Systems, Biomass, Solar Systems, Wind Energy, Ground Source Systems, Air Source Heat Pumps, and Energy from Waste. The Guide reviews each of these options by providing details of the principle of the technology, the potential for Co_s savings and the implications for the building and services. Guidance is also offered on the type and scale of development for which each low and zero carbon energy technology option is most feasible.

Water and Drainage

3.6 Water efficiency, through measures such as low volume dual flush WCs, reduced bath sizes, reduced flow/spray taps and efficient appliances, is recognised as the best method for saving water in any building. The Guide describes these various technology options and their benefits in terms of efficiency savings. In addition, the benefits of water recycling, through grey-water and rain-water harvesting systems for both internal and external use are highlighted. In terms of drainage, the Guide focuses on the principle of Sustainable Urban Drainage Systems, such as pervious surfaces, filter drains/strips, and differing forms of swale/pond, as a means of reducing surface-water run-off rates and reducing flood risk.

Materials

3.7 The Guide outlines the importance of all forms of material in securing sustainable forms of development and the sustainability factors to be considered in making materials choices in all types of building, particularly issues such as embodied energy, resource degradation, and toxicity. The intention is to ensure that in making choices, the principles of sustainability form the principal basis for decision-making.

Waste and Recycling

3.8 Two critical areas of waste reduction and recycling are identified in the Guide, (i) waste produced during construction and (ii) waste produced during the lifetime of the development. The Guide highlights the importance of Sustainable Waste Management and the need for waste reduction during all stages of the development process, utilising waste minimisation and site waste management plans. Emphasis is also placed on the increasing need to reduce waste arising from demolition, and to secure the appropriate re-use of materials.

Pollution

3.9 The construction industry is identified as a major source of pollution, with key issues relating to air and water quality and noise pollution. The Guide identifies the importance of appropriately managing these consequences at the construction stage.

Health and Wellbeing

3.10 In designing and constructing buildings, regard should be had to the health and wellbeing of future occupiers. Whilst recognising that other, non-planning factors are the main contributors to health and wellbeing, consideration in design should be given to daylighting and ventilation needs, outlook, temperature and noise levels.

Transport

3.11 The Guide identifies both transport and access during and after construction as being particularly important. Construction Management plans and logistics planning are identified as a means of controlling the construction phase, whilst directing development to locations with access to modes of transport other than the private car is noted as key to reducing private vehicle trips in the operational phase of development. Travel Plans are highlighted as a mechanism for controlling private vehicle trips and enhancing the attractiveness of alternative modes of transport.

Landuse and Ecology

3.12 To minimise the loss of Greenfield sites, the Guide recognises and highlights the policy focus of directing development towards brownfield sites. Whilst the need for remediation of contaminated soils is highlighted as a constraint to such development, the sustainability benefits far outweigh any potential costs. Furthermore, re-developing such sites is likely to cause less ecological harm. However, some brownfield sites possess ecological interest and, as such, site selection is identified as important.

Construction Management

3.13 The Guide highlights the importance of the construction phase of a development and indicates that in order to minimise the effect on the environment and local community, developers should sign up to the Construction Industry Board's Considerate Constructors Scheme.

Other Matters

Strategic Scale Low and Zero Carbon Technologies

3.14 In view of the significant scale of growth anticipated in West Northamptonshire over the next 15 years, the Guide considers the potential for strategic scale renewable energy provision. In particular, the Guide reviews the contribution that large scale wind, district heating, biomass, combined heat and power and waste to energy technologies could make as part of strategic scale development and some of the key planning and environmental factors to take in to consideration when promoting, developing and assessing such schemes.

Exemplar Scheme Review

3.15 To assist in understanding the practical application of the range of Sustainable Design and Construction options outlined in the document, the Guide goes on to review some exemplar schemes which vary by type and scale of development, but which demonstrate sustainable approaches to building design.

Technology Approach Matrix

3.16 Appendices A and B offer a simple user guide to the value, and likely benefit of, each of the Sustainable Design and Construction options outlined in the Guide by type and size of development. This user guide should be used by those preparing planning applications to WNDC in the development stage of schemes to ensure that the most beneficial sustainable design and construction options are incorporated where possible. The user guide also acts as a useful reference tool for those determining planning applications in accordance with the Framework Manual.

4.0 Conclusions

4.1 The Technology Guide seeks to highlight a range of Sustainable Design and Construction options that will assist developers and applicants in identifying the most suitable forms of sustainable technology by type and scale of development, and will be used as a background document by those assessing such applications to ensure the principles of sustainable development have been embraced in development proposals to an appropriate level. In this respect, any such assessment will have regard to the range of benchmarking methods outlined, and to the detail set out in the WNDC Sustainability Manual Framework Document, which takes forward the underlying principles in the Technology Guide.

4.2 Together with the Sustainable Development Policy Guidance (SDPG), this will place sustainability at the heart of planning in West Northamptonshire and demonstrate to all those involved in the development process of the need to fully embrace sustainable development principles to not only address the causes and effects of climate change, but to ensure the needs of future generations are not compromised.