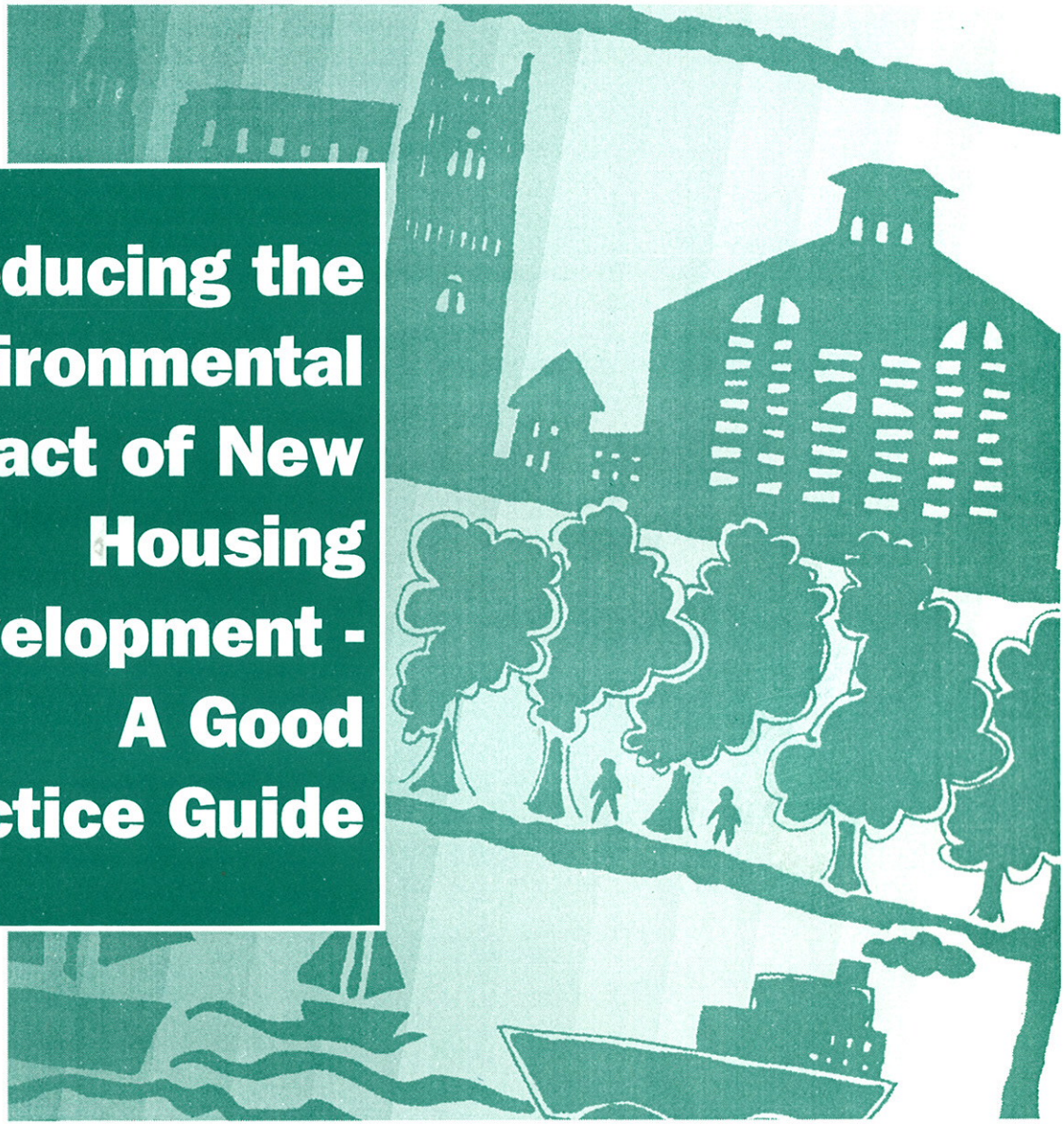
Ipswich Local Plan

Supplementary Planning Advice



Reducing the Environmental Impact of New Housing Development - A Good Practice Guide

IPSWICH BOROUGH COUNCIL

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August 1999

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Design and layout by Ipswich Borough Council's Corporate Design Unit.

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1. WHAT THIS GUIDE IS ALL ABOUT

1.1 Ipswich Borough Council wishes to encourage developers to adopt good environmental practice in the layout and construction of new housing sites. The good practice described in this guide outlines ways in which developers may:

- Achieve water and energy efficiency gains in new homes that translate into real cost savings for householders
- Manage the disposal of surface water to reduce the quantity and improve the quality of runoff, leading to cleaner rivers and streams and opportunities for cost savings for developers
- Design sites that encourage wildlife, are more enduringly attractive, easier to market and higher in value.

Adopting environmental good practice features can also benefit developers by leading to an enhanced public image and potentially speedier development processes.

2. THE ENVIRONMENTAL ISSUES

2.1 Current projections show that Ipswich will have to accommodate substantial number of new homes in the future. New housing development has an impact on the appearance of the Town, and the Council will promote high quality design in all new developments. This is the subject of a range of Local Plan policies and other planning guidance.

2.2 In addition to its appearance, new housing development has a significant impact on the environment, both at a local and global level. Housing development can touch to a greater or lesser extent on every aspect of environmental change including global warming, ozone depletion, acid rain, depletion of fossil fuel reserves, release of toxic chemicals into the environment and loss of wildlife.

2.3 Through its commitment to sustainable development, the Government has pledged to halt and reverse these processes of environmental change. Recently it has been the signatory to a number of international agreements covering amongst others, climate change and Biodiversity.

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2.4 Homes are responsible for around a quarter of the CO_2 emissions in the UK. CO_2 is a 'Greenhouse Gas' and improving the energy efficiency of housing could have a significant impact on reducing some of the processes of climate change.

2.5 At a more local level, housing development has traditionally been perceived as detrimental to wildlife. Whilst this may be true for poorly designed developments, there is evidence that wildlife can be encouraged by well designed schemes. Carefully designed sites can offer richer flora and fauna for towns and more attractive and easier to market schemes for developers.

2.6 Water conservation is becoming increasingly important throughout Suffolk. East Anglia is the driest region in the UK and much of its indigenous water resources are fully utilised. New housing will lead to additional demands for water. It is becoming increasingly important to include measures for recycling, increased water efficiency and reuse of water in all new developments.

3. POLICY CONTEXT

3.1 The Council is committed to promoting the highest standards of environmentally responsible design in new housing. This document aims to provide advice and guidance to housing developers to support this aim, and to help bring about practical action in the field of sustainable development. It provides supplementary planning guidance to Local Plan objectives and to policy NE27 in particular (see Appendix 1).

3.2 At a national level, PPG1 makes it clear that sustainability is a material consideration in determining planning applications. However, there is growing recognition that one of the biggest barriers to achieving more sustainable development through the planning system is the fragmented nature of knowledge and practice. This document aims to bring together a broad range of ideas related to sustainable housing development, and direct designers to other sources of information in an attempt to overcome this barrier.

3.3 Many ideas in this document are concerned with issues that are considered within the planning process such as site layout, landscaping and building design. However, it also contains information on other aspects of design, traditionally outside the scope of the planning system, such as insulation levels.

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3.4 It is important to note that the Council will not secure objectives through the planning system that would normally be achieved under other legislation (e.g. Building Regulations). However, many of the features of sustainability need to be incorporated early in the design process. It may be too late to introduce improvements to a design at the stage of applying for Building Regulation approval. By raising these issues at the planning stage it is hoped they can be adopted more widely.

3.5 The Council has a duty to take into account a range of concerns when determining planning applications. Such concerns include the appearance of proposals and the impact new buildings may have on neighbouring properties in terms of overshadowing or privacy. Whilst it will support high quality and innovative designs, the Council will not grant planning permission for developments which do not respect the character of the Town, or are likely to cause an unacceptable loss of privacy or overshadowing, even if they demonstrate high standards of environmentally sensitive design.

3.6 These guidelines interpret and provide more detail for the implementation of Local Plan policies and have been produced in line with Government guidance. However, new ideas are emerging rapidly and good practice is still evolving. This guide does not aim to provide an exhaustive list of all current ideas, but rather to set out the direction of change required for more sustainable development.

3.7 This guide is set out in three sections. It first considers issues relating to the site itself, then the design of individual buildings and finally offers some information on the selection of building materials.

4. THE SITE

4.1 A thorough understanding of the site will help to generate appropriate design solutions. The design and layout should take full advantage of the site's characteristics and use them to their full potential. First and foremost, the design should seek to create a pleasant, accessible and safe environment for residents and visitors. Whilst bearing this in mind, designers should also think about the site in relation to opportunities to save energy (both within the buildings, and in moving to and from them), making the most efficient use of the land itself, and making the most of the site's topography and soil type when designing drainage solutions and landscaping schemes. The site assessment should identify areas of wildlife interest on and around the site. Site appraisals should be carried out as early in the development process as possible. It

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becomes progressively more difficult to incorporate good practice for drainage or biodiversity later in the design. In the following section each element is considered in more detail.

4.2 Energy

4.2.1 During cold periods it is important to protect buildings from cold winds, and to collect and store any available heat. During hot periods buildings shouldn't overheat. Making full use of natural daylight will reduce energy use for lighting during the day.

4.2.2 The sun's energy can be used to help run the building in terms of heating and lighting requirements. Generally the principle is to make as much use of this "free" energy as possible. Sites should be laid out so that buildings can harvest these resources, whilst being protected from exposure to cold winds.

4.2.3 Sunlight can contribute over 30% of the useful heat input into a house. The aim of passive solar design is to plan the layout of roads and individual plots to take advantage of available light. Benefits will be greatest when the site and individual buildings are designed with sunlight in mind. (A description of the desirable characteristics of houses is given in the following section, however, it is worth pointing out that designs do not have to be extreme in any sense and are saleable in current markets).

4.2.4 Buildings must receive direct sunlight in order to benefit from effective solar gain. Windows lose more heat than they gain in conditions of indirect sunlight, so in order to achieve a net gain layouts must provide for:

- the elevation with most glazing to face within 30 degrees of south (it is not necessary to slavishly orientate all plots due south), and;

- ensure that the southern aspect of the house is free from obstructions that may overshadow it.

(Note that during the heating season (October - March) the sun is low in the sky and easily obstructed. This should be borne in mind when designing landscaping schemes and determining the spacing between buildings.)

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4.2.5 Some sites are more suited to benefit from solar gain than others. Sites on south facing slopes will tend to reap the most benefits. Flat sites can benefit providing they are carefully designed to avoid overshadowing. Land on north facing slopes receives least solar energy per square metre. Slopes in excess of 10% gradient facing within 45 degrees of north are unlikely to be satisfactory for solar designs. In these cases, insulating the buildings to high standards may reap more rewards.

4.2.6 In order to avoid overshadowing, it is necessary to calculate the length of shadows likely to be cast by existing and proposed buildings and space new buildings accordingly. The shadow length is determined by the height of the obstruction, the gradient of any slopes and the latitude of the site. The following figures taken from the UWE/LGMB Design Guide may be used as a guide for shadow lengths in Ipswich (latitude 52 degrees):

- flat site: shadow is 3.38 x obstruction height
- site tilting 10% towards south: shadow is 2.4 x obstruction height
- site tilting 10% towards north: shadow is 5.35 x obstruction height typically, for a development of two storey homes on a flat site this will mean allowing around a 21m north - south gap between houses to ensure at least 3 hours of sunlight per day all year round.

4.2.7 Complete freedom from overshading is rarely possible, but it can be minimised by:

- locating low rise buildings such as bungalows to the south side of the site, and taller buildings to the north;
- locating well spaced detached housing to the south of the site, to allow some penetration of sunlight between the houses, and;
- designing planting with height limits in mind.

4.2.8 It is important that living rooms feel private without obscuring south facing windows. If people feel overlooked, they may resort to net curtains. Their use can cut out around 20% of available sunlight, defeating the object of passive solar design.

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4.2.9 Note that the impact of a new development on the daylight levels of adjacent existing buildings should also be considered.

4.2.10 Shelter belts incorporated within the layout can reduce heat loss from buildings due to wind-chill. They can also improve the amenity of cycle/footpaths. Using native species in the shelter belt can create a more useful wildlife habitat and, as the plants will be well adapted to local conditions, they can require less maintenance.

4.2.11 The efficiency of the shelter belt will be influenced by its height, shape, orientation and density. It should be placed to shelter the site from the prevailing winds with the greatest wind chill during the heating season (In Ipswich the prevailing wind is from the south west, but the coldest winter winds normally come from the east/north east). Shelter belts should be curved to shed cold prevailing winds.

4.2.12 Buildings are typically sheltered within a distance of 6 times the height of the shelter belt. It is important to achieve a consistent density, especially at low level.

4.2.13 During the summer, shelter belts can provide shade and reduce the risk of overheating. At other times, however, such shade may conflict with the need for solar access. If this is the case, the tallest trees should be deciduous to allow for some penetration of the winter sun.

4.3 Movement

4.3.1 The layout and design of streets and paths has a significant influence over whether energy efficient modes of transport are used. Detailed advice on the design of roads and footpaths within residential areas is set out in the Suffolk Design Guide. For the purposes of this guidance, it is worth emphasising some of the characteristics the Council will wish to see incorporated into the design of roads and paths within new developments.

4.3.2 Much post war housing development has been characterised by mediocre layouts resulting from the dominance of the road, which is always set out before the design of the buildings and the spaces in between them. Often, the needs of the car have dominated housing developments to the detriment of pedestrians and cyclists, preventing access for public transport and at the expense of a sense of place and identity.

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4.3.3 This situation has encouraged car use, with all of the environmental problems that that entails, and it has been a barrier to the development of communities as people travelling to and from their homes by car have fewer opportunities to interact with one another.

Designers can encourage more energy efficient and sociable modes of transport by making them as attractive and convenient as possible. The design of the infrastructure should reflect the following sequence of priorities:

- Pedestrians
- Cyclists
- Public Transport
- Private cars

Within this sequence, road layouts should make provision for service and emergency vehicles.

4.3.4 Cars can be integrated into the development, but they should not dominate it. Speed should be reduced through design (20mph), and should emphasise steady speed. Traffic calming features that cause cars to move around in a stop-start style are likely to increase noise and local air pollution.

4.3.5 The layout of the routes should have regard to the local context of existing routes and the topography of the site. Consider how the development will relate to existing routes around or within the site. It is important to include not only formal roads and footpaths but also informal pedestrian "desire lines" which may cross the site. Designers should seek to retain such routes and promote the continuity of legible routes around the site.

4.3.6 Making the site as permeable as possible, retaining existing routes with minimum deflection and establishing new routes where appropriate will facilitate walking and cycling. This may require a shift away from the cul-de-sac design which can frustrate pedestrians by necessitating lengthy detours.

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4.3.7 One of the aims of the cul-de-sac layout is to reduce danger and escape routes. Improving accessibility by retaining and establishing through routes across the site may conflict with the interests of safety and crime prevention. The answer lies partly in good layout, ensuring the streets and public spaces are easily policed by residents and avoiding threatening features such as blind corners, and also in creating neighbourhoods where walking is a natural and popular way of moving around the site. Increasing the number of people on the streets itself improves security.

4.3.8 Increasing the number of access points to the development can distribute traffic more evenly throughout the site. This can have a number of advantages:

- dwellings situated on the access roads will suffer less air and noise compared with sites of a similar size served by only one access point;
- shared surfaces can be used more generally;
- routes tend to be more direct, with higher amenity and safety, due to lower volumes of traffic.

4.3.9 Creating through routes across the site could lead to "rat running". "Weak links" within the network of streets which allow pedestrians, cyclists and emergency and service vehicles access throughout the site but restrict access to private cars can overcome this.

4.3.10 The quality of pedestrian and cycle routes is an important factor in encouraging people to use them. Routes should be designed to be accessible to all members of society, technical information on the needs of disabled people is given in the Suffolk Design Guide (3.9.1-3.9.11)

4.3.11 Try to ensure footpaths and cycle routes have good access to sunlight and are protected from the wind. Steep gradients should be avoided; routes should ideally follow the contours of the site. Junction design should facilitate pedestrians and cyclists to take the shortest route, minimising deflection of their desire line. Surface dressing should be selected with care - pedestrians require surface texture to prevent sliding, cyclists prefer smooth well drained surfaces free from inspection chamber covers or drainage grates. Pedestrian links should be 'connected, continuous, convenient, convivial and conspicuous'.

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4.3.12 A number of Green Corridors are identified in the Local Plan. The Green Corridors initiative aims to promote pleasant traffic free routes for pedestrians and cyclists throughout the Town. Where development sites lie within the vicinity of these corridors, developers will be expected to contribute to the initiative by establishing routes through their sites.

4.3.13 Provision should be made for public transport and necessary infrastructure where appropriate. Ideally, all homes should be within 400 metres walking distance of a bus stop.

4.4 Water

New housing development impacts on water resources in a number of ways:

- the combination of increasing population, reducing household size and growth in discretionary water use can result in increases in household water consumption
- positive outfall drainage systems on development sites pipe away rainfall that would have infiltrated the soil and replenished ground water reserves
- rainfall that has been in contact with road surfaces, typically contains a wide range of contaminants including oil, organic matter and toxic metals. This runoff contributes to poor river quality.

4.4.1 The objectives of developers seeking sustainable solutions to dealing with water on site are therefore to reduce the water input into each house and reuse water within the site. Disposal should be the final option. To do this:

- incorporate water efficiency measures into house designs to deliver a product that incorporates customers' desires for water efficiency which translate into real cost savings.
- maximise opportunities for surface water to infiltrate the ground around the site, and ensure that water courses or sewers are protected from contaminated run off whilst maintaining efficient drainage of surfaces.

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- opportunities to reduce water consumption are discussed in the following section. The following information aims to provide guidance on drainage issues:

Drainage

4.4.2 Poor quality surface water runoff can seriously affect the watercourse or sewer it is discharged to. The main causes of contamination are either:

- that the surfaces drained are not clean - they may be contaminated with oil from motor vehicles, refuse, organic matter or other spillages or,

- that surface water drains are misused for the disposal of foul sewage, chemicals or oil either by accident or ignorance.

4.4.3 There are a variety of techniques available to designers which will protect watercourses while increasing infiltration. In selecting a scheme for an individual site, priority should be given first to minimising the amount of runoff collected, then removing runoff from the site in a way which reduces pollutant levels and allows further infiltration.

Reducing Quantity of Runoff.

4.4.4 Dealing with surface water as close to the source as possible and minimising the amount of runoff collected will minimise the amount of pollutants discharged into the watercourse. On some sites it may avoid the need to lay surface water sewers altogether.

4.4.5 Many areas of a development can be allowed to drain naturally or, if appropriate, water can be led off into areas such as private gardens where it can soak away whilst reducing the need for irrigation. Of those areas that remain, the use of porous surfaces can reduce the amount of runoff requiring positive drainage. Materials such as gravel, porous asphalt or manufactured porous blocks can be used to construct driveways and parking areas, allowing water to pass through into the subgrade.

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4.4.6 Water from roofs can be directed into rainwater butts for re-use or onto private gardens to soak away naturally. Alternatively, where ground conditions permit, infiltration trenches or soakaways may be used. These systems work best when dealing with small quantities of water, they should be distributed throughout the development site.

Removing Runoff

4.4.7 Where positive drainage of an area is necessary, using a system that moves water towards the receiving water course or sewer whilst allowing further infiltration, filtering and attenuating the flow of water after periods of heavy rain will accrue further benefits. There are two main methods of achieving this:

Filter (or French) Drains

Comprise a gravel filled trench into which surface water is led. They may incorporate an overflow pipe to a conventional surface water sewer if necessary.

Surface water swales

Comprise a grassed depression which leads water overland from the drained area to the discharge point. They can often be easily accommodated within landscaping schemes. (Children's safety may be a consideration when designing these schemes - side slopes shouldn't be steeper than 1 in 4 and the maximum depth of water shouldn't exceed 500mm.) Swales also provide a good opportunity to create valuable wildlife habitats.

Both of these systems have the advantage that they can filter pollutants to some extent, further improving water quality.

Choosing the Best Option

4.4.8 Which option to choose of those described, if any, will depend on the nature of the soil around the site, the site's topography and the efficiency of drainage required. Fortunately much of Ipswich is based on sand and gravel which has good infiltration properties. There are however a few areas dominated by clay soils and, particularly by the river, silt which may be unsuitable for infiltration based drainage schemes. Some low lying sites at risk of flooding from rivers may have high ground water levels, precluding the use of soakaways. Similarly, the stability of steeply sloping sites may be threatened

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by concentrated discharges of water into the ground. It is essential to conduct a thorough survey of the site and consult with the drainage authorities before deciding on a scheme.

4.4.9 Regular maintenance of soakaways and swales is essential to ensure their continued effective operation. Planning conditions may be used to secure such an appropriate maintenance regime. In some cases the Council may assist developers in meeting their maintenance responsibilities by adopting the area in question. If developers wish the Council to adopt such areas, a maintenance payment will be required from the developer, secured through a planning obligation agreement.

4.5 Wildlife

4.5.1 All new developments can make a positive contribution to the stock of wildlife habitats in the Town. The process should start with an appraisal of the site, identifying particular features such as trees and other planting that may provide a refuge for wildlife. Ideally, this should be done in consultation with a local wildlife group such as the Suffolk Wildlife Trust who can provide specialist knowledge and advice. The aim should be to preserve valuable sites and identify any 'dead' areas of land that could be used for habitat creation.

4.5.2 Early structural planting with native species along the main roads and boundaries of the site can provide an attractive partially mature setting for the completed development and provide a refuge for wildlife disturbed during the construction process.

4.5.3 Design the planting to form a continuous network throughout the site, linking larger planted areas with narrow landscaping strips so that they combine to create 'wildlife corridors'. Aim to link these corridors with habitats outside the site.

4.5.4 Wildlife friendly design of materials and structures that the wildlife will encounter are encouraged. Wildlife friendly kerbstones to allow the movement of amphibians without directing them into the storm water systems could be included. Roadside gully pots have been shown to pose a major hazard to amphibians and should be avoided where possible.

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4.6 Other Considerations

4.6.1 This section sets out a range of other features that the Council will encourage in the design and layout of sites:

Recycling Facilities
Such facilities should be well lit with convenient cycle and car parking and suitably landscaped. Ideally they should be located close to bus stops.

Recycled Children's Play Equipment
If a play area is to be provided - specify equipment and surfacing manufactured from recycled material.

Low Energy Street Lights
Can save electricity - light pollution is an area of increasing concern and should be minimised through the appropriate use, direction and effective screening of light fittings.

Landscaping
Should avoid the use of environmentally damaging materials such as peat or water-worn limestone. The Council can provide an effective alternative to peat based soil improver made from recycled material from its award winning composting plant in Ipswich.

5. THE BUILDING

5.1 The techniques described in the previous section for increasing solar gain, sheltering buildings and dealing with water will realise greatest benefits when the principles are carried through from the layout of the site to the design of individual houses. In addition, the design of individual houses should consider the need for the house to be flexible and durable over its life span. This section explores some of these issues.

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5.2 Designing for Solar Gain

5.2.1 The previous section described how solar gain can contribute over 30% of the energy requirement for a dwelling; and that in order to maximise benefits the site should be laid out so plots have a southerly aspect and are largely free from overshadowing. In order to realise the potential of good site design there are some straightforward, cost effective measures that should be adopted within the building, together they can lead to a 10% reduction in space heating demand compared with an average new house.

5.2.2 *Bias glazing to the southern side of the house*
The houses do not need to have especially large south facing windows, it is more important to restrict the size of windows facing north. Typically, houses designed to benefit from solar energy have around three-quarters of the total glazing area on the south side. This can pose challenges for designers in terms of creating an attractive northern facade and in maintaining privacy on the southern side of the building. The height of windows may be more important than their width in relation to access to sunlight. It is worth remembering that the generous overhanging eaves that are characteristic of houses around Ipswich can reduce the risk of overheating in the summer when the sun is high in the sky.

5.2.3 *Plan the internal layout to take advantage of the sunny side of the house*
Rooms which are most frequently used and require higher temperatures such as living rooms and bedrooms, should be located on the south side. Kitchens should ideally be placed on the north side to reduce the risk of overheating.

5.2.4 Use a well insulated compact plan to minimise exposed surface area. Insulation levels should be in excess of Building Regulation standards. (As a guide, the Council recommends around 200mm of insulation in the roof space, approx. 70mm in cavity walls). Double-glazing should be used throughout. Semi-detached or terraced houses have fewer exposed walls and therefore tend to be more efficient. Contrary to popular belief, conservatories can be ineffective as an energy saving measure, due in part to a tendency for people to heat them. Additions such as porches and conservatories outside the main envelope of the building should be thermally isolated from the rest of the house and unheated.

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5.2.5 *Control Ventilation*
Particular attention should be given to minimising draughts. However, it is important to remember that high insulation levels may lead to condensation problems - ventilation systems should be designed accordingly. Compact and affordable heat exchangers are becoming more widely available now; they can recover much of the heat ordinarily lost through ventilation systems.

5.2.6 *Use dense materials to absorb solar gains*
Using block rather than stud walls and specifying heavyweight flooring materials such as stone or brick can even out temperature variations and avoid excessive temperatures in the summer. Denser materials will act as a thermal store, causing the building to cool more slowly after the sun has set or the heating switched off.

5.2.7 *Use an appropriate heating system*
Fast response, high efficiency heating systems with thermostatic radiator valves are preferable. Generally condensing boilers are more efficient. If the house is thermally efficient, it may be economically viable to install solar panels.

5.3 Designing for Flexibility and Durability.

5.3.1 Houses should be fit for use over their life span during which the patterns of occupancy will vary. It should be assumed that the house would be home to elderly people, children, people working from home and people with restricted mobility (either temporary or permanent).

5.3.2 Householders may wish to modify and extend their homes as their needs change. For the sake of the long-term sustainability of the building it should be designed to be capable of adaptation and extension.

5.3.3 In practice, a few simple characteristics incorporated into the design of the main body of the building can help to meet these objectives.

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- *Circulation space*
  Whilst tight circulation space might be efficient in the short term, it may be too inflexible in the long term. Some slack in the plan in the right places can facilitate future extensions, avoiding the need to make substantial alterations to the original house. For example; allow space for stairs to a future room in the roof space, ensure downstairs cloakrooms are large enough to be converted into a WC suitable for use by disabled people.

  The Council has published guidance on the design of housing accessible to disabled people, much of which is concerned with circulation space. Following it will not only make homes more accessible to disabled occupiers and visitors but also can make life easier for able bodied people who from time to time have to move objects such as prams around their homes. (See Accessible General Housing - December 1997).

- *Roofs*
  Steep roof pitches of over 40° are characteristic of houses around Ipswich. Such pitches also facilitate the future conversion of the roof space by householders. Attic conversions are generally more cost effective and energy efficient than ground level extensions, they do not entail the loss of garden space or obstruction of daylight. However, recent building practices of using trussed rafters makes the roof space unusable. Using traditional rafter and purlin construction together with attic joists that can take future floor load allows more flexibility.

- *Services*
  Drainage, water and fuel supply lines should be aligned and ducted to avoid having to disturb them if householders choose to extend the house in the future. Some house builders have started grouping all of the service meters (Gas, electricity, water, etc.) together in one inspection chamber at ground level. This can avoid the need for unsightly inspection covers on the front of the house and is a practice the Council wishes to encourage.

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- *Utility Space.*
  Inconvenient storage at home is one of the greatest deterrents to the use of cycles for short journeys. Similarly, many households who wish to recycle more of their waste are constrained from doing so by the lack of space for the storage of bottles etc. Building designs should incorporate sufficient utility and storage space to enable occupants to conveniently store cycles and recycling bins.

5.4 Designing for Water

5.4.1 Water conservation is becoming an increasingly important issue. It is important that new homes are designed to make more efficient use of water. All new homes must now be fitted with water meters; this change is leading householders to increasingly see water as a commodity rather than an environmental resource. Homes which feature water saving measures are likely to be more attractive to prospective purchasers.

5.4.2 Water consumption can be influenced by reducing and reusing water around the house.

5.4.3 The biggest consumer of water within the home is the WC. Typically, they account for around a third of total consumption. Reducing the amount of water consumed by the WC can have a large impact on total water consumption.

5.4.4 In new dwellings in the UK standard 7.5 litre WC's are installed. Some European countries have adopted standards for 6 litre cisterns. Assuming a WC accounts for 33% of total water consumption, specifying a 6 rather than 7.5 litre cistern will lead to a 6.6% reduction in water use. Dual flush cisterns will lead to further savings.

5.4.5 Similarly, fitting showers which typically use around 30 litres will lead to significant savings over baths (which use around 80 litres). Fitting a shower as well as a bath may lead to a 6.8% reduction in total consumption. (Fitting a Power Shower can negate these saving as they use more water than a bath if used for longer than five minutes.) Fitting spray or mousser taps to wash hand basins can also cut water consumption, although they should not be fitted to taps where the primary purpose is to fill a receptacle (e.g. baths) as this would just make the task take longer.

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5.4.6 Fitting a diverter from a rainwater down pipe to a water butt is one of the cheapest and easiest methods of reducing water consumption outside the home. Collected water can be used for irrigating gardens or washing cars. Water butts should be placed on a stable platform to enable people to place a bucket under the tap. It is important that they are not at risk of toppling over. An overflow to a soakaway or back into the surface water drain should also be fitted.

5.4.7 Designing a landscaping scheme which is sensitive to the soil conditions and moisture levels of the site (e.g. selecting native species well adapted to the site conditions), and takes advantage of the site's topography to direct surface water to landscaped areas will help to reduce the need for supplementary irrigation. Use of mulches or wooden decking in gardens can also reduce the levels of maintenance and irrigation required.

5.4.8 Finally, research and pilot studies are currently underway into the recycling of "Grey" water. Grey water consists of water from baths and wash basins. This water can be recycled for flushing WC's, or used to artificially recharge aquifers or water courses via an appropriate cleansing/filtering system typically consisting of reed beds. The Council is hopeful that the pilot schemes will show the recycling of grey water is a practical proposition with significant environmental benefits. If this is the case, the Council will seek to widely promote such schemes. However, until the current schemes have been evaluated it is not appropriate to seek their widespread implementation.

6. BUILDING MATERIALS

6.1 Careful choice of building materials is one of the most important areas of design. When specifying building materials, in addition to selecting products that are fit for their purpose, designers should consider where the material was sourced from (was it a sustainable source?), how much energy was used in its extraction/manufacture and whether there are any recycled alternatives available. This information is not always easy to come by from suppliers; however, there are some guide books available which comment on the environmental impact of building materials. Organisations such as the Association of Environment Conscious Builders may also be able to help.

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6.2 Traditional buildings in the Ipswich area were made largely from local building materials (with the exception of some stone, and slate roofing material which was imported). Using local materials reduces transportation costs; traditional materials tend to be suitable for the local climate. Interestingly buildings made from traditional materials sit better within the townscape. Emphasising the special local character of the area can help to develop a sense of identity and community.

6.3 The choice of materials can have an impact on the environment and the health of occupiers. When specifying materials, designers should consider possible problem materials and alternatives. Some materials that may be considered problematic are listed below:

6.4 *Insulation*
Many insulation materials contain CFCs, which includes most plastics. CFCs are a major contributor to climate change. Some materials are now offered as "CFC free", but use other harmful foaming agents. More benign products include mineral fibres which have not proven to be harmful but must be used with care - fibres cannot be allowed to escape into habitable spaces. Insulation material made from recycled newsprint - treated with a fire retardant - is also becoming available.

6.5 *Chipboard, Particleboard and Medium Density Fibreboard (MDF)*
These contain formaldehyde which can outgas into the building. Alternatives include solid timber or blockboard which has a higher proportion of solid wood. Low formaldehyde versions should be specified where possible. (Ensure such products come from certified forests where clear cutting and other environmentally damaging practices are banned - the Forest Stewardship Council can help to locate suitable suppliers).

6.6 *PVC*
This material is banned in certain parts of Europe. Its use has raised concerns amongst environmentalists, particularly in relation to the creation and release of toxic chemicals such as dioxin during its manufacture and disposal. It is commonly used to fabricate rainwater goods, drainage pipes, doors and window frames and floor coverings. Environmentally benign (and aesthetically better) alternatives exist for all of these products and should be specified instead of PVC. The material is also associated with electrical cabling - traditionally there

Reducing the environmental impact of new housing development

has been no alternative, however, some PVC free products are now appearing under the description of halogen-free cable. Although many manufacturers sell a range of halogen free cables, they still have a small market share so you may have to ask cable dealers or wholesalers to get them in stock.

6.7 *Lead*
Toxic in manufacture, use and disposal, alternatives to lead, such as copper, are becoming available although they may not be as flexible.

6.8 *Timber Preservatives*
Must be toxic to some extent in order to work, however, not all timber needs to be treated (BS5268: Part 5 regards the use of preservatives as essential only on sole plates, load bearing joinery and timber in contact with the ground). The indiscriminate treating of timber should be avoided.

Appendix 1

Structure and Local Plan Policy

This document provides supplementary planning guidance to policy NE27 of the Ipswich Local Plan which states:

> **The Council will support and encourage the conservation of energy and the use of alternative and renewable sources of energy in the design and layout of development proposals for new buildings and converted existing buildings. In considering applications for planning permission the Council will, where appropriate, encourage the use of:-**
>
> **(a) Heat recycling and solar energy**
> **(b) Layouts which reduce wind-chill**
> **(c) Maximum natural daylight; and**
> **(d) Alternatives to non-renewable materials (e.g. tropical hardwood)**

Relevant Polices from the Deposit Draft Suffolk County Structure Plan include ENV11 which states:

> **Energy conservation will be promoted in new development which should maximise energy efficiency through siting, design, landscaping, orientation and choise of materials, consistent with the principles of good design.**

Appendix 2

Appraisal of projects Summary Checklist

Site Appraisal

Energy

- Have all slopes facing within 45° of south and 45° of north been identified with regard to solar access and exposure?
- Has the opportunity been taken to orientate plots south where possible?
- Have areas of shelter been identified - particularly existing copses and hedgerows that could act as windbreaks and provide a wildlife habitat?
- Have potential new shelter belts been considered?
- Have areas of shadowing/overshadowing been identified?

Movement

- Is every part of the development within 400 metres of a bus stop?
- Have existing cycle/footways been identified and links to surrounding areas maintained or improved?
- Are cycle/footways as direct as possible, serving main desire lines?
- Are crossing points designed to give pedestrians/cyclists priority?
- Have potential areas of conflict between cyclists, pedestrians and vehicles been identified and resolved?
- Are gradients/bends/junctions/surfaces and the use of kerbs and steps appropriate for cyclists, pedestrians and wheelchair users?
- Are routes legible? - i.e. well lit, signed and aligned along recognisable routes?

Appendix 2
Appraisal of projects Summary Checklist

- Could the development promote sustainable transport modes and Biodiversity by enhancing green corridors?
- Are the public sides of houses arranged to provide natural surveillance?

Water

- Have infiltration rates been assessed ? - will ground conditions permit the use of soakaways?
- Has water on-site been considered for a major source of support for Biodiversity?
- Has the potential to have on-site storage of water and dual (white & grey) water supplies in the future been considered ?

Wildilfe

- Have features that do/could provide a wildlife habitat been identified?
- Has the opportunity to create wildlife corridors within the development been investigated?

Other Considerations

- Could the site accommodate recycling facilities?
- Is street furniture and any children's play equipment manufactured from recycled materials?
- Have low energy bulbs been specified for street lighting?
- Has the planting scheme been specified with soil conditions in mind? - Does it avoid the use of peat based soil improver?

Appendix 2

Appraisal of projects Summary Checklist

Individual Houses

- Has the internal floor plan and glazing been designed to maximise solar gain?
- Have dwellings on north facing plots been insulated to higher standards?
- Has the choice of heavy or lightweight building materials been influenced by their thermal characteristics?
- Is there enough flexibility in the plan to allow for alterations and extensions, or for the adaptation of the house for a disabled person?
- Has the roof structure and roof space been designed to allow future conversion to living accommodation?
- Have opportunities been taken to collect and store rainwater?
- Have water saving fixtures and fittings been specified where appropriate?
- Have building materials been selected in order to avoid damage to human health or the environment in their manufacture, and the construction, occupation and dismantling of the building?

Appendix 3
References and contacts

The following documents provide further information on topics covered in this advice note:

Urban Redevelopment for Industrial and Commercial Uses

A Guide to Sustainable Urban Drainage

and

Making your Home and Garden more Water-Efficient

All are published by the Environment Agency

Planning for Passive Solar Design, published by the Building Research Establishment

Sustainable Settlements, published by the Local Government Management Board and the University of the West of England

The following organisations are able to offer further advice on aspects of this paper:

The Building Research Establishment (BRE)
Garston, Watford WD2 7JR
Tel. 01923 664258

The Association of Environment Conscious Builders (AECB)
Tel/Fax 01559 370908

The Forest Stewardship Council
Tel/Fax 01686 412176