Local Development Framework

District Design Guide:

High Quality and Sustainable Development in South Cambridgeshire

Supplementary Planning Document
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CHAPTER 1

INTRODUCTION TO THE SUPPLEMENTARY PLANNING DOCUMENT

1.1 This South Cambridgeshire District Council (SCDC) District Design Guide Supplementary Planning Document (SPD) forms part of the South Cambridgeshire Local Development Framework (LDF).

1.2 The SPD expands on district-wide policies in the Development Control Policies Development Plan Document (DPD), adopted in July 2007, and policies in individual Area Action Plans for major developments that may vary from the district-wide policies. It provides additional details on how they will be implemented. Policies seek to ensure that design is an integral part of the development process.

1.3 The SPD builds on national policy in Planning Policy Statement (PPS) 1: Delivering Sustainable Development, and Planning and Climate Change – Supplement to PPS1. These promote sustainable, well-designed development to achieve a high quality built and natural environment. Achieving good design and sustainable development are the core principles underlying planning. At the heart of sustainable development is the simple idea of ensuring a better quality of life for everyone, now and for future generations.

1.4 "We cannot afford not to invest in good design. Good design is not just about aesthetic improvement of our environment, it is as much about improved quality of life, equality of opportunity and economic growth. If we want to be a successful and sustainable society we have to overcome our ignorance of design and depart from our culturally ingrained notion that a poor quality environment is the norm… Good design does not cost more when measured across the lifetime of the building or place." (CABE, The Value of Good Design, 2002)

PURPOSE

1.5 The purpose of this District Design Guide is to ensure delivery of sensitively and appropriately designed, sustainable developments. This document sets out important design principles based on recognised good practice and explains key requirements of the District Council that will be taken into account when considering planning proposals. It is not a 'recipe book' of design solutions.

1.6 The Supplementary Planning Document provides additional advice and guidance on design and achieving sustainable development and expands on the policies set out in the Local Development Framework, in particular Development Control Policies DPD Policies DP/1 and DP/2.

1.7 Specific objectives of this document are to:

- Assist applicants in the achievement of an attractive, sustainable, well-designed, high quality environment that integrates housing, employment and community uses, together with infrastructure and green areas in conjunction with the surrounding landscape.

- Assist applicants' understanding of the local context, help identify features of importance, and ensure that proposals are appropriately designed to be compatible with their surroundings.

- Assist applicants gain planning permission quickly by informing them what information is required to accompany planning applications to justify their proposals and demonstrate what impact they would have.

SOUTH CAMBRIDGESHIRE LDF POLICY

1.8 Achieving sustainable development is at the heart of planning, and will be controlled by the following policy in the Development Control Policies DPD:

SUSTAINABLE DEVELOPMENT

POLICY DP/1 Sustainable Development

1. **Development will only be permitted where it is demonstrated that it is consistent with the principles of sustainable development, as appropriate to its location, scale and form. It should:**

   a. **Be consistent with the sequential approach to development, as set out in the Strategy chapter of the Core Strategy DPD;**

   b. **Minimise the need to travel and reduce car dependency;**

   c. **Make efficient and effective use of land by giving priority to the use of brownfield sites and achieve adaptable, compact forms of development through the use of higher densities;**

   d. **Include mixed-use development of compatible uses as appropriate to the scale and location of the development;**

   e. **Where practicable, use sustainable building methods and verifiably sustainable, locally sourced materials, including recycled materials, and include a Travel Plan to address the travel needs of labour during construction;**

   f. **Where practicable, minimise use of energy and resources;**

g. **Where practicable, maximise the use of renewable energy sources;**

h. **Incorporate water conservation measures;**

i. **Minimise flood risk;**

j. **Where practicable, use sustainable drainage systems (SuDS);**

k. **Mitigate against the impacts of climate change on development through the location, form and design of buildings;**

l. **Ensure no unacceptable adverse impact on land, air and water;**

m. **Contribute to the creation of mixed and socially inclusive communities and provide for the health, education, recreation, community services and facilities, and social needs of all sections of the community;**

n. **Where practicable, include infrastructure for modern telecommunications and information technology to facilitate home working;**

o. **Conserve and wherever possible enhance biodiversity of both wildlife and the natural environment;**

p. **Conserve and wherever possible enhance local landscape character;**

q. **Involve community and providers of community services in the design process;**

r. **Conserve and wherever possible enhance cultural heritage.**

2. **In criteria e, f, g, j and n it will be for any applicant or developer proposing to compromise sustainability to demonstrate the impracticability of use of sustainable methods, systems, materials and energy sources and provision of sustainable infrastructure. Additional cost will not, on its own, amount to impracticability.**

3. **For major developments, applicants must submit a Sustainability Statement and a Health Impact Assessment, to demonstrate that principles of sustainable development have been applied.**

1.9 The design of new development will be controlled by the following policy in the Development Control Policies DPD:

DESIGN OF NEW DEVELOPMENT

POLICY DP/2 Design of New Development

New Development Design

1. **All new development must be of high quality design and, as appropriate to the scale and nature of the development, should:**

   a. **Preserve or enhance the character of the local area;**

   b. **Conserve or enhance important environmental assets of the site;**

   c. **Include variety and interest within a coherent design, which is legible and provides a sense of place whilst also responding to the local context and respecting local distinctiveness;**

   d. **Achieve a legible development, which includes streets, squares and other public spaces with a defined sense of enclosure and interesting vistas, skylines, focal points and landmarks, with good interrelationship between buildings, routes and spaces both within the development and with the surrounding area;**

   e. **Achieve a permeable development for all sectors of the community and all modes of transport, including links to existing footways, cycleways, bridleways, rights of way, green spaces and roads;**

   f. **Be compatible with its location and appropriate in terms of scale, mass, form, siting, design, proportion, materials, texture and colour in relation to the surrounding area;**

   g. **In the case of residential development, provide higher residential densities, and a mix of housing types including smaller homes;**

   h. **Provide high quality public spaces;**

   i. **Provide an inclusive environment that is created for people, that is and feels safe, and that has a strong community focus;**

j. Include high quality landscaping compatible with the scale and character of the development and its surroundings.

Design and Access Statements

2. Design and Access Statements submitted to accompany planning applications and applications for listed building consent should be compatible with the scale and complexity of the proposal and, as appropriate should include:

k. A full site analysis of existing features and designations;

l. An accurate site survey including landscape features and site levels;

m. The relationship of the site to its surroundings;

n. Existing accesses for pedestrians, cyclists, equestrians and vehicles;

o. Any known historic importance;

p. Opportunities for maximising energy efficiency and addressing water and drainage issues.

3. The Access element of the Statement should demonstrate that the development will achieve an inclusive environment that can be used by everyone, regardless of age, gender or disability. It should also address how the development has taken account of the transport policies of the development plan.

1.10 All new development will have an impact on its surroundings. The aim must be that any development, from a major urban extension to Cambridge to an extension to an existing home, takes all proper care to respond to its surroundings, including existing buildings, open spaces and village edges, and ensure an integrated scheme that does not harm local amenity and wherever possible, brings benefits to the area.

1.11 A fully integrated and responsive design-led approach to development is therefore needed. For all development, a design-led approach will ensure that every proposal, whatever its scale, responds positively to the particular characteristics of a site and its surroundings and reinforces local distinctiveness.

1.12 The location and design of development should contribute to global sustainability by addressing the causes and potential impacts of climate change, through reducing energy use, reducing emissions, promote

renewable energy resources, and take climate change impacts into account, according to Key Principle ii in PPS1.

1.13 There are a number of documents, covering sustainability and design issues, produced by the Council or its partners that form a material planning consideration when determining planning applications. These include other SPDs, for example on Conservation Areas and Listed Buildings, Village Design Statements, Conservation Area Appraisals. Many of these set out particular local characteristics that should be protected or enhanced. Appendix 2 references useful sources of further information.

PART I

GEOLOGY, TOPOGRAPHY AND HISTORICAL CONTEXT

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CHAPTER 2

THE DESIGN CONTEXT

THE GEOLOGY OF SOUTH CAMBRIDGESHIRE

2.1 The geological deposits that underlay South Cambridgeshire predominantly date from the Cretaceous Period of geological history (65 to 140 million years ago), which, by geological standards, are therefore relatively young. In the north-west of the district are a series of slightly older clay deposits from the Upper Jurassic Period. The geology is divided into a series of strata that outcrop in bands running roughly north-east to south-west across the district (see map in Fig 2.1). These formations were laid down as successive marine deposits that have since been raised and tilted to slope south-eastwards by earth movements in Tertiary times.

2.2 The south-eastern half of the district is underlain by Chalk, a soft white limestone of great purity and composed almost entirely of calcium carbonate derived from the shells of marine animals deposited in a warm, clear sea. Chalk is a relatively soft rock that makes a poor building stone, but in this region a more resistant formation from the Lower Chalk beds was sometimes used in traditional buildings, where it is referred to as clunch. The Lower Chalk beds also include a Chalk Marl that is particularly suitable for the manufacture of cement. In the south-east parishes of the district the chalk is overlain by glacial bolder clay, deposited by the retreating glaciers at the end of the last ice age.

2.3 Nodules of flint, a few centimetres or more in diameter, are a feature of Chalk deposits. Flint is very hard and composed of silica, chemically unrelated to chalk, but with its origins also in marine organisms, albeit ones with delicate skeletons of silica. The silica forming these skeletons was not particularly stable and, after the creatures' death, it was dissolved into the chalk where it re-deposited in a more stable form as nodules of flint. The hard nature of the flint nodules makes them difficult to shape for use in walling. Because of this, the traditional form of flint walling was to lay rough nodules of flint in beds with one side crudely faced, or knapped, and to use brickwork to frame rectangular openings for windows and doors, or to turn corners. This careful, selective use of brickwork reflected the relatively high cost of importing bricks from the adjacent clay areas, and has created a distinctive appearance in the region.

2.4 North-west of the chalk is a band of dark blue/grey clay, known as the Gault Clay. In the 18th Century this band of clay began to be worked on a large scale for brick making, producing at first a 'white' brick that weathers grey, then later in the 19th Century, the characteristic yellow 'Cambridge stock' brick. The same beds were worked for plain clay peg-tiles for the 15th

Century onwards with clay pan-tiles becoming widespread from the 18th Century.

2.5 Immediately north-west of the Gault Clay is a narrow band of sandstone, referred to as the Lower Greensand. This band is relatively insignificant in the northern parts of the district, but it produces a slightly raised rib of land above the adjacent clay fens that is the site for a number of settlements, most notably Cottenham and Oakington. Further north the city of Ely is sited on an 'island' of Greensand that outcrops within the fenland. To the west of the district the band of Greensand increases in width and around Gamlingay it becomes much more prominent in the landscape.

Fig 2.1 Map showing the principal geological deposits of South Cambridgeshire

THE TOPOGRAPHY OF SOUTH CAMBRIDGESHIRE

2.6 While much of South Cambridgeshire is low lying, there are some significant variations to the topography across the district, with a strong correlation to the underlying geology outlined in the previous section.

2.7 The fenland lies at, or around, sea level with the 10-metre contour defining the fen-edge, and along which line a number of villages are sited. These fens broadly correspond to the clay deposits that lie to the north of Cambridge. As one moves onto the chalklands the land quickly rises into rolling downland that is generally between 20 and 40 metres above sea level, though slightly higher in the east. Further south and east the chalklands continue to rise into a range of low lying hills, which are around 100 metres above sea level. The highest ground in the district is in the south at Great Chishill, where the hills reach a height of just under 150 metres. In the west of the district is a second range of chalk hills, which correlate to a finger of chalk that projects into the Gault Clay, though these hills are not as high and only attain a height of 70 to 80 metres above sea level.

2.8 All of the chalklands, along with the eastern fens, drain to the River Cam and its associated tributaries, which in turn feeds into the River Great Ouse. The fens that lie to the north drain direct to the Great Ouse, where it also forms the northern boundary of the district, and eventually reaches the sea at the Wash.

Fig 2.2 Map outlining the basic topography of South Cambridgeshire

THE HISTORICAL DEVELOPMENT OF SOUTH CAMBRIDGESHIRE

2.9 The siting and historical development of settlements within South Cambridgeshire is closely associated with the communication network (particularly at river crossings or road junctions), the avoidance of land liable to flooding and developments in agriculture. The spring-lines between the chalk and clay were favoured areas for settlement, and so, to an even greater extent, were the river valleys, with their light gravel and alluvial soils and good communications. The chalk areas to the south could only be settled where water supplies were available, but the open aspect of this countryside made it particularly suitable for trade routes from east to west across the region, using numerous parallel tracks that are collectively known as the Icknield Way.

Prehistoric

2.10 In Palaeolithic and Mesolithic times the area was occupied by hunter-gatherers, when much of the area that was later to become fen was then above sea level, so could also support the hunter-gatherer societies in a forest landscape. It was the rise in sea level that accompanied the melting ice-cap at the end of the last ice age that led to periodic flooding and the development of the fenland areas. In Neolithic times communities became more settled and an agrarian based society started to develop. These early communities established themselves on the chalk grasslands around the Icknield Way, along the river valleys and fenland edge, and on the lighter soils associated with the Greensand. The development of these communities continued through the Bronze Age and into the Iron Age, by when farming had become so well developed that huge tracts of land were covered by ditched fields and enclosed homesteads, especially in areas of gravel subsoil.

Roman

2.11 The Roman towns of this region, Cambridge, Godmanchester, Sandy and Great Chesterford, are all located just outside the District, but their markets brought prosperity to the adjacent rural areas and the network of Roman roads have left a lasting legacy. The best preserved Roman settlement is at Bullock's Haste in Cottenham; a site so large that it appears more like a town than a village, while Romanisation of the countryside was established through a series of villas that were at the centre of agricultural estates. Those excavated at Litlington and Ickleton were particularly large and magnificent examples, while others are known at Babraham, Bartlow, Comberton, Guilden Morden, Horningsea, Horseheath, Linton, Shepreth, Teversham and Great Wilbraham. Another important feature of the Roman occupation were canals. Car Dyke, visible today at Cottenham, Landbeach and Waterbeach, was used to transport food-stuffs, leather goods and other products from the agricultural regions of southern Cambridgeshire to the army stationed in Northern Britain. It may also have served to drain neighbouring land.

Anglo-Saxon

2.12 Occupation of a number of Roman sites is believed to have continued on into Saxon times, along with use of the Roman roads, since many Saxon settlements and burial sites follow these routes. The best-known sites from the early Anglo-Saxon period are a series of cemeteries and defensive Dykes, though more recent excavations have now revealed evidence of huts, halls and other signs of human occupation at Hinxton, Linton, Cottenham, Waterbeach, Pampisford and Great Wilbraham. The four great Anglo-Saxon dykes in South Cambridgeshire (Miles Ditches, Bran Ditch, Brent Ditch and Fleam Dyke), together with the larger Devil's Dyke in East Cambridgeshire, all appear to have had the same function, namely to protect land in the east by preventing easy access along the Icknield Way, and all are built to a similar pattern, with wide, flat bases and straight-sided ditches on the western side.

Middle Ages

2.13 By 1086, when the Domesday Book was written, all the current villages of South Cambridgeshire existed, with the exception of the modern communities of Bar Hill and Cambourne, though most have undergone a number of changes since their Saxon foundation. Medieval society reached its peak in the latter years of the thirteenth century, before economic decline and a series of disastrously wet cold summers in the early years of the fourteenth century led to famines, followed in 1348 by the Black Death. Most villages in the area were not to regain the levels of their thirteenth century populations until the nineteenth century and the resulting labour shortage lead to much of the land being converted to sheep pasture.

Post Medieval

2.14 In the late seventeenth century work started to drain the fens by cutting a series of canals that would take excess water straight to the sea. The process was to be fraught with problems as the peat shrank, leaving much of the land below sea level and windmills (later replaced by steam, diesel and electric pumps) were then required to lift the water back up to sea level. However, the rich farmland that was created by this process was capable of supporting a large population and the villages along the fen-edge expanded as a result.

2.15 Until the middle of the eighteenth century the majority of parishes continued to farm in common, as they had since Saxon times, with the huge medieval open fields worked in narrow strips. Then, over a period of 100 years, these fields were enclosed by successive acts of Parliament as the Enclosure movement brought about major change to the countryside. At the same time many common rights to grazing and gathering fuel were also lost, and most of the countryside became private property. This radical change in land-ownership meant the end of the traditional peasant class in England and much of the population moved to urban areas, or emigrated to America or Australia. Populations fell in all but the commuter settlements

immediately adjacent to Cambridge, and this pattern continued through the first half of the twentieth century, exacerbated by the impact of the First World War and the depression of the inter-war period. It wasn't until after the Second World War that the pattern was to change, and the villages once again started to expand to cope with the housing needs of a growing population.

2.16 The result of this continuous occupation of South Cambridgeshire is an extensive legacy of built and natural heritage. Collectively this creates a many layered, historic landscape of great beauty and diversity that helps establish local identity at the parish level. However, the pace of change since 1945 has been intense and is, arguably, accelerating. The resultant pressures on our inherited landscape have profound implications for the social and economic well being of the district, far beyond aesthetic and academic interests.

CHAPTER 3

VILLAGE LANDSCAPE AND SETTLEMENT ANALYSIS

INTRODUCTION

3.1 This section outlines the importance of character and the crucial contribution good design can make to its conservation and enhancement. It aims to ensure that very careful consideration is given to the way new development relates to its surroundings. An overview of the landscape settlement character of South Cambridgeshire is provided. This is followed by the identification of five distinctive landscape character areas:

A – South East Clay Hills,
B – Chalklands,
C – Western Claylands,
D – Western Greensand, and
E – Fen Edge (see Figure 3.1).

3.2 The parishes that occur within each area are listed (note some parishes straddle the boundaries these are therefore listed under both areas). For each defined area, a brief descriptive analysis explains in simple terms the essential design relationship between:

i. **Landscape Character** - the patterns of the landscape, its geology and overall form, slope and climate, vegetation and the setting of buildings and villages within it.

ii. **Settlement Character** – the shape of settlements, their built forms and their relationship with the wider countryside.

iii. **Building Materials** – the nature of the buildings, their massing, materials, scale, colour, texture and characteristic detailing.

iv. **Trees and Hedgerows** – plant species common to the area.

3.3 Based upon an analysis of the relationship between these elements, the design implications for new buildings are highlighted in the form of a 'bullet point' list of design principles that can be used to guide the form and appearances of new development in the countryside and in the villages.

THE IMPORTANCE OF CHARACTER AND GOOD DESIGN

3.4 Character can be described as a distinct, recognisable and consistent pattern of elements that make each place different and distinctive. It is influenced by visual, ecological, historical, settlement and building elements, together with less intangible aspects such as tranquillity and

sense of place. The distinctive character of our surroundings has a fundamental impact on our quality of life and therefore identifying, protecting and enhancing those elements that contribute to character is a key aspect of our sustainability.

3.5 The Council is concerned that poorly designed new development will erode the established character of the landscape and settlements through lack of respect for local diversity and distinctiveness. Common use of standardised building designs and layouts, and the suburbanisation of rural settlements though poorly designed village extensions will have particularly significant effects on character.

LANDSCAPE CHARACTER OVERVIEW

3.6 The South Cambridgeshire landscape as a whole has several distinctive and readily identified characters. Medium to large-scale arable farmland landscapes dominate. Woodland and small copses tend to be widely dispersed or absent, and the density of hedgerows is relatively low. As a result it is predominantly open, allowing long views. Contrasting patterns of hedgerowed pastures and parkland create variety, and a greater degree of enclosure in some parts, for instance associated with settlements. The landform reflects the broad variations in the underlying geology and continuity of settlement in the area. The geology ranges from the 'upland' undulating chalklands and clay hills in the south, to the low lying flat Fen Edge with its scattered fen 'islands' north of Cambridge. Rivers and streams cut through the higher land creating gentle shallow valleys, whilst straight dykes and ditches are a feature of the drained fen edge. Both winding and straight narrow roads link the settlements. Surviving features from different eras are part of the rich historic character of the landscape, including visible archaeological features such as the Fleam Dyke and the Bartlow Hills, ancient field boundaries and medieval narrow strip fields, as well as many moated sites, windmills, historic parklands, farmsteads, and groups of cottages.

SETTLEMENT CHARACTER OVERVIEW

3.7 Villages are particularly distinctive in the landscape. Small, medium and large villages occupy a variety of positions, hilltops, valley-sides and along spring lines. They often exhibit a complex mix of patterns, including linear, dispersed, nucleated, agglomerated and planned. A surprising number have been formed from amalgamation of initially separate and ancient hamlets. Villages that grow up along important communication links are often linear, with an area of green in front of buildings, as at Comberton, or at each end, as at Harston. While there are no complete planned medieval villages in South Cambridgeshire, there are planned elements that survive in villages such as Swavesey. Development was also affected by phases in population growth or decline, visible at Bassingbourn where there are whole

areas of house plots under grass. Finally, village pattern is often affected by the location and extent of open space, particularly greens and common land with settlements. Typically the villages have developed from historic cores that exhibit a varied mix of vernacular building materials, including brick, rendered plaster, weatherboarding, plain tiles, pantiles, and thatch. Some villages, particularly those closer to Cambridge, have experienced significant growth with modern estates visible at their edges. Nonetheless, most villages make a very positive contribution to local landscape character. Features such as attractive groupings of historic buildings, village greens, common land, mature trees and church towers are all important to this.

Figure 3.1 Map of South Cambridgeshire indicating broad landscape character assessment as set out in the Countryside Agency's Countryside Character for East of England

The South-East Claylands

Parishes – Balsham (eastern sector), Carlton (western sector), Castle Camps, Horseheath, Linton (north-east sector), Shudy Camps, West Wickham, West Wratting (eastern sector), Weston Colville (eastern sector).

Landscape Character

3.8 This is an undulating area reaching 100 – 120 meters in height on the hilltops. A scattering of farmsteads and small settlements interspersed with farm woodlands, contribute to landscape character. The field sizes are mostly large, but are united by the gently rolling landform and woodland. An historic irregular field pattern remains, Earthbanks are a distinctive feature along with some roadsides, reflecting ancient hedge and bank field boundaries; a few still retain their hedges. Long open views extend to wooded skylines, and sometimes village rooftops and church towers. The area has a surprisingly remote, rural character.

3.9 The key characteristics are:

- An undulating boulder clay landform, dissected by small stream valleys.
- Predominantly arable farmland with a wooded appearance.
- Trees and woodlands appear to join together to create a wooded skyline, with some bare ridgelines.

Settlement Character

3.10 Villages and small hamlets in this area typically have strong linear forms, often with a wooded setting and mature hedgerows and trees that

contribute to rural character. Small paddocks and long back gardens also help to soften village edges. Generally they include a mix of more substantial farmhouses arranged in a loose knit pattern, interspersed with open frontages. The slightly larger village of West Wratting includes some continuous frontages that historically provided enclosure to the streets. Any areas of modern infill are generally limited. Small village greens of irregular shape, including narrow 'strip' greens, are a feature in a few villages such as West Wratting and West Wickham.

3.11 The key characteristics are:

- Mostly small villages and hamlets (locally known as 'Ends') are sited on valleysides or on ridgetops, often having a linear form.
- Buildings are arranged in a low density, loose knit pattern along narrow winding or gently curving lanes.
- Mature trees and hedgerow are important features, mainly in private curtilages, giving a strongly rural character to settlements.
- Village edges are often softened by; woodlands, copses, small fields paddocks and long back gardens.
- A few isolated farmsteads are located along lanes or at track ends.

3.12 Building and Materials:

- Buildings are generally one and a half or two storeys, and predominantly detached or semi-detached, with spans of between four and six metres.
- The vernacular detailing of walls is mainly of plastered timber frame construction, often with distinctive decorative pargetting in a variety of patterns. A few flint and weatherboarded buildings occur. Gault brick occurs in some later buildings.
- Roofs are typically of longstraw thatch and plain clay tiles.
- Details of timber-framed buildings include steep roof pitches, four or five planked doors, casement and sash windows, and chimneys located laterally on the roof ridge, or at gable ends.

3.13 Trees and Hedgerows

- Mixed Woodland
  Dominant trees: oak, ash. Less common: wild cherry. Glades and near edges: field maple.
- Hedgerows, Woodland Edges and Scrub
  Hawthorn, hazel, blackthorn, dog rose, crab apple, field maple and, occasional, dogwood.
- Trees in Hedgerows
  Dominant: Oak. Sub-dominant: ash, field maple.
- Avenues
  Oak, lime, horse chestnut.

- Stream Sides
  Dominant: alder. Sub-dominant white willow, crack willow, goat willow. Occasional: Guelder rose, dogwood. Occasional where not waterlogged: hazel, ash, oak.

Design Principles

3.14 Based on the above analysis of landscape settlement and built character, the following key design principles are set out:

- Maintain the distinctive, dispersed settlement pattern of small villages and hamlets and isolated farmsteads, within the context of their wooded landscape setting.
- Ensure any small extensions to villages on hilltops are located along ridgelines, and extensions to villages on valleysides are located parallel to the contours of the hillside.
- Maintain the strong linear form of villages and hamlets by limiting backland and cul-de-sac developments.
- Ensure density and pattern of new developments reflect that of existing villages and hamlets. Houses should normally be set back from the street with front gardens, except where enclosure of the street frontage is important to the historic character.
- Use a framework boundary of native woodland, tree and thick hedge planting that reflect the local mixes, to integrate new developments.
- Ensure new developments reflect the form, scale and proportions of the existing vernacular buildings of the area and pick up on the traditional building styles, materials, colours and textures of the locality.
- Enclose boundaries facing roads by hedgerow or low flint and brick walls.
- Avoid unnecessary widening or straightening of narrow hedgebanked lanes.
- Ensure large barns are sited and designed to minimise their bulk and impact on the wider landscape, normally relating them to existing groupings of farm buildings. Prominent ridgeline sites should be avoided.
- Avoid the use of standardised and intrusive urban materials, street furniture, lighting and signage as part of traffic claming measures

The Chalklands

Parishes – Abington Piggotts, Balsham (western sector), Babraham, Barrington, Bartlow, Bassingbourn cum Kneesworth, Carlton (eastern sector), Duxford, Fen Ditton, Fowlmere, Foxton, Fulbourn, Great Abington, Great and Little Chishill, Great Shelford, Great Wilbraham, Guilden Morden, Harston, Hauxton, Heydon, Hildersham, Hinxton, Ickleton, Linton (west and south-east sectors), Litlington, Little Abington, Little Shelford, Little

Wilbraham, Melbourn, Meldreth, Newton, Pampisford, Sawston, Shepreth, Stapleford, Steeple Morden, Stow cum Quy, Teversham, Thriplow, West Wratting (western sector), Weston Colville (western sector), Whaddon, Whittlesford.

Landscape Character

3.15 This character area is a broad scale landscape of large fields, low trimmed hedgerows and few trees. Certain high points have small beech copses which form strong focal points, and there are occasional shelterbelts around settlements. By way of contrast, the eastern part of the area is cut through by the valleys of the rivers Granta and Rhee, which have an intimate character of small grazing meadow and wet woodlands, with lines of willows along the rivers. Some historic parkland within these valleys also adds to their distinctive character.

3.16 The key characteristics are:

- A distinctive landform of smooth rolling chalk hills and gently undulating chalk plateau.
- A mostly large-scale arable landscape of arable fields, low hedges and few trees, giving it an open, spacious quality.
- Remnant of chalk grassland occurs on road verges and along tracks.
- Small beech copses on the brows of hills, and occasional shelterbelts, are important features.
- A wealth of historic and archaeological features, including; ancient trackways, earthworks and small chalk pits.
- Shallow valleys of the River Ganta and River Rhee have a rich mosaic of grazing meadows and parkland.
- Lanes are often straight, occasionally ‘dog-legging’.
- Mostly strong rural character, though this is disrupted immediately adjacent to major roads such as the A505 and the M11.

Settlement Character

3.17 Both small and large villages generally have a strong historic, linear form, though extensive modern estate developments have occurred in some villages close to Cambridge. Others, such as Bassingbourn, are the result of amalgamation of older hamlets. These linear villages widen out in places to include village greens, such as the large, oval green at Barrington and the smaller, triangular one at Heydon. A few villages, such as Little Shelford, have a rectangular form of looser structure with a number of important open spaces included. The village edges are varied, typically abutted by a mix of open fields, woodland, or smaller fields. Long back gardens also help to form a transition to the surrounding countryside.

3.18 The key characteristics are:

- Small villages, such as Thriplow and Litlington, are located on gentle slopes along spring lines, or on hilltops, such as Great Chishill.
- Other villages, such as Hildersham and Little Shelford, are located within the river valleys on lower valleyside slopes, sometimes related to crossing points and fords.
- Mostly a well treed character to villages, which are often not visible in the wider landscape, despite adjoining open arable fields. Avenue trees on wide road verges are characteristic of some approaches, such as Fowlmere.
- Enclosed meadows and parkland are important features of village setting in the river valleys.
- Village greens are common, both small and large.
- Mostly linear form to the settlements.
- Buildings are either arranged as continuous frontages facing streets, or have a much looser pattern with open land interspersed.
- Deep, narrow rear gardens.
- Many mature trees, both in front gardens and on the grass verges, together with streams and ponds, add to the rural character.
- A few isolated farm buildings are sited at track ends, often hidden by groups of mature trees or shelterbelts.

3.19 Building and Materials

- Buildings are traditionally two storey, simple and small in scale. A few, large, two and a half, or three storey C 18th and C 19th houses occur in some villages.
- A wide variety of materials are used in walls, including; plastered timber-frame constructions (weatherboarded or rough-cast render on laths) clunch, clay batt, knapped flint, plain gault brick, red and yellow gault brick. Farm buildings are typically black-tarred weatherboarding. Colours of buildings are generally light and warm, often pale cream, but some are painted pale pink or yellow and, occasionally, earthy red.
- Roofs of vernacular buildings are typically of longstraw, thatch and plain clay tiles and pan-tiles, with some more recent use of Welsh slate and reed thatch.
- Plastered timber-framed building details include; high-pitched roofs, drip-boards set in the gable ends and over windows, four or six panelled or planked doors, and with chimneys set laterally on the ridge to roofs.
- Eighteenth and nineteenth century house details include; low-pitched roofs, vertical sliding sash windows set in deep reveals over shallow stone sills, with gauged or segmental brick arched lintels and chimneystacks incorporated within the building at the gables.

- Both low and high flint boundary walls are common, some with red brick detailing. Clipped hedges and simple picket fences also provide boundary features. Occasionally simple iron railings are associated with larger houses.
- Many of the C 20th estates do not respond to the local vernacular.

3.20 Trees and Hedgerows

- Beech Hangers
  Beech, with occasional additional species from 'Mixed Woodland' below.
- Mixed Woodland
  Dominant trees: beech, ash. Less common: small-leaved lime, hornbeam, wild cherry, yew. Glades and near edges: field maple.
- Hedgerows, Woodland Edges and Scrub
  Hawthorn, hazel, blackthorn, field maple, dog rose, and, occasional, wild privet and wayfaring tree.
- Trees in Hedgerows
  Dominant: ash. Sub-dominant: beech, field maple.
- Avenues
  Predominately Beech or ash.

Design Principles

3.21 Based on the above analysis of landscape settlement and built character, the following key design principles are set out:

- Maintain the distinctive, settlement pattern of the area and its local context.
- Ensure any extensions to springline villages are located along the bottom of steeper slopes and along lanes.
- Ensure any extensions to river valley villages are located along the line of the river, or at right angles to it, depending on the direction of the main transport route.
- Maintain the linear, or rectilinear form of the settlements.
- Ensure density and pattern of new developments reflect that of existing villages and hamlets. Avoid backland and cul-de-sac developments.
- Ensure buildings are arranged in continuous frontages within village cores and are arranged in loose knit patterns facing the street on more peripheral sites.
- Ensure new developments are integrated with sufficient space for garden and street tree planting where applicable.
- Enhance village gateways and, where appropriate, consider provision of avenue planting on village approaches.
- Take opportunities to create new village greens and/or wildlife areas within new developments.

- Ensure new developments reflect the form, scale and proportions of the existing vernacular buildings of the area and pick up on the traditional building styles, materials, colours and textures of the locality.
- Enclose boundaries facing the street in village cores by low, or high, flint walls with brick detailing, simple decorative railings, or picket fencing.
- Enclose boundaries facing the street on village peripheries with hedge and tree planting.
- Avoid the use of standardised and intrusive urban materials, street furniture, lighting and signage as part of traffic claming measures.
- Ensure new agricultural buildings, such as large storage sheds, are sited and designed to reduce their apparent mass, minimising their impact on the wider landscape by the appropriate use of texture, colour and planting.

The Western Claylands

Parishes – Arrington, Bar Hill, Barton, Bourn, Boxworth, Caldecote, Caxton, Childerley, Comberton, Conington, Coton, Croxton, Croydon, Dry Drayton, Elsworth, Eltisley, Grantchester, Graveley, Great Eversden, Hardwick, Harlton, Haslingfield, Hatley, Kingston, Knapwell, Little Eversden, Little Gransden, Lolworth, Longstowe, Madingley, Orwell, Papworth Everard, Papworth St Agnes, Shingay cum Wendy, Tadlow, Toft, Wimpole.

Landscape Character

3.22 This character area comprises gently undulating arable farmland with, mostly, large fields and low trimmed hedgerows. Occasional medium to large sized ancient woodlands provide a distinctive feature and church towers and spires are key landmarks. Despite the presence of some major roads, much of the area has a relatively tranquil, rural character.

3.23 The key characteristics are:

- The gently undulating topography is divided by broad, shallow valleys.
- It is a predominantly open and intensive arable landscape. Fields are either bounded by open ditches, or closely trimmed hedgerows, both with a variable number of hedgerow trees.
- Woodlands are scattered. Large, ancient woodlands are particularly concentrated in the north and west of the area.
- Occasional parklands and orchards add interest and variety in the landscape.
- Each village is identified by a church spire, or tower, which enliven the skyline.

Settlement Character

3.24 The mostly small, scattered villages of this area often have well defined edges provided by mature trees, thick hedgerows, copses or parkland. Small fields and paddocks also contribute to their landscape setting, providing a transition to the surrounding countryside. Generally the villages have a strong, linear form with rows of cottages and a few, larger farmsteads facing roads and paths. Highfields, Caldecote (which has a planned rectilinear street pattern) and Bar Hill (which is a C 20th new community) are not typical of the area.

3.25 The key characteristics are:

- Villages are either located on the sides of small valleys (such as Bourn and Little Gransden), along spring lines (such as Haslingfield) or on slightly elevated ground within broad valleys (such as Comberton and Grantchester).
- Woodlands, copses, paddocks and, occasionally, parklands contribute to the distinctive landscape setting of villages, creating a wooded character and providing a link to the surrounding countryside.
- The historic villages are mostly linear in form, despite modern infilling in some villages.
- Buildings are typically arranged in loose knit patterns, sited close to roads or paths. Frontages include open spaces which allow visual unity with surrounding fields and woodlands.
- Mature trees, hedges, picket fences and walls contribute to the informal rural character.
- Small irregularly shaped village greens are sometimes a feature, such as at Madingley.
- Outside the village core areas there are often scattered isolated farms, with some intrusive modern farm buildings.

3.26 Building and Materials

- Buildings are generally one and a half or two storeys in height and domestic in scale.
- A variety of wall materials are used, including; plastered timber-frame construction (mostly cream in colour), warm red brickwork and occasional yellow brick. Farm buildings are typically of brick, weatherboarding and flint.
- Roof materials include plain clay tiles, pantiles longstraw thatch and Welsh slate.
- Details which characterise timber-frame buildings include; high pitched roofs, casement windows or horizontal sliding sashes (Yorkshire sashes) set flush with the outside face of the wall, drip boards set in the gable ends and over windows, four or six panelled or planked doors and chimneys set laterally on the roof ridge.

- Eighteenth century houses, which occur in a few villages such as Grantchester, have details that include four and six panelled front doors, gauged brick arches over windows and distinctive cornices.
- Nineteenth century houses, which occur in a few villages such as Grantchester and Comberton, have details which may include; sawtooth dentil courses under the eaves, four or twelve pane vertical sliding sash windows, four panelled doors, contrasting brick dressing or decorative polychromatic brick banding and chimneys sited at the gables flush with the gable walls.
- Many modern estates in the larger villages, such as Comberton, do not respond to the local vernacular.

3.27 Trees and Hedgerows

- Mixed Woodland
  Dominant trees: oak, ash. Less common: wild cherry. Glades and near edges: field maple.
- Hedgerows, Woodland Edges and Scrub
  Hawthorn, hazel, blackthorn, dog rose, crab apple, field maple and, occasional, dogwood.
- Trees in Hedgerows
  Dominant: Oak. Sub-dominant: ash, field maple.
- Avenues (all one species, not mixed)
  Oak, lime, horse chestnut.
- Stream Sides
  Dominant: alder. Sub-dominant (not in mixes) white willow, crack willow, goat willow. Occasional: Guelder rose, dogwood. Occasional where not waterlogged: hazel, ash, oak.

Design Principles

3.28 Based on the above analysis of landscape settlement and built character, the following key design principles are set out:

- Maintain the distinctive settlement pattern of mostly small, scattered villages and isolated farmsteads.
- Ensure any extensions to valleyside villages are located parallel to contours or at right angles to them along lanes reflecting the historic settlement form.
- Ensure the linear or rectilinear form of settlements is maintained, avoiding backland and cul-de-sac development.
- Ensure buildings are arranged in a loose knit form, facing and close to the streets. Ensure they are well integrated with tree planting and hedgerows of local mixes.
- Ensure new developments reflect the form, scale and proportions of the existing vernacular buildings in the area, picking up on the traditional building styles, materials colours and textures of the locality.

- Mark street boundaries by the use of simple picket or trellis fencing, hedges, or low brick walls.
- Avoid unnecessary straightening and widening of narrow country lanes and the use of standardised and intrusive urban materials, street furniture, lighting and signage as part of traffic claming measures.
- Ensure new, large agricultural buildings, such as barns, are sited and designed to reduce their apparent mass, and minimise their impact on the wider landscape by the appropriate use of texture, colour and planting.

The Western Greensand

Parishes – Gamlingay

Landscape Character

3.29 This is a very small character area associated with the undulating dip slope of the Lower Greensand ridge. It is drained by small streams and there are some locally steep slopes. The fairly wooded landscape is interspersed with medium sized arable fields, small areas of pasture and market gardening. There are also small areas or remnant parkland and heath. Despite the presence of some worked out gravel pits, the area retains a predominantly rural character.

3.30 The key characteristics are:

- Undulating dip slope of the Lower Greensand ridge, drained by small streams creating a relatively small scale, varied landform.
- The area has a mixed land use pattern of arable farmland, pasture and market gardening, and deciduous and coniferous woodland.
- Remnant patches of heathland and parkland treebelts add interest and variety.

Settlement Character

3.31 Within the area there is a dispersed pattern of farmsteads and cottages along lanes and one large village of Gamlingay, This has radiated out from a crossroads along five routes. The eastern half of the village is dominated by the historic core, which is of a linear development along Church Street, and the openness created by the village college playing fields, In the western half modern residential and industrial infill has occurred. The historic core comprises a wide range of buildings, many fronting directly onto the street, creating a sense of narrowness and enclosure.

3.32 The key characteristics are:

- Farmsteads, cottages and small, detached houses associated with smallholdings are dispersed along lanes.
- Historic core of Gamlingay retains a strong linear form with mostly continuous frontages radiating out along roads.
- Narrow, gently curving streets, with houses generally sited on the back edge of the pavement.
- Open fields, hedgerowed paddocks, woodland and stream valleys contribute to the distinctive landscape setting, despite a harsh urban edge in parts.

3.33 Building and Materials

- Buildings are generally one and a half or two storeys, with spans of between four and six metres.
- The range of building styles within the village includes small vernacular cottages, medieval farmhouses and buildings, C 18th, C 19th and early C 20th villas together with many C 19th terraces.
- Walls are constructed of timber-frame with plastered finish (coloured cream, yellow and pale pink) carstone (sandstone) and red and yellow brick. Farm buildings are of weatherboarding and brick.
- Vernacular roofs are of plain clay tiles, pantiles longstraw thatch and Welsh slate.
- Timber-framed building details include; high pitched roofs, casement sash windows set flush with the outside face of the walls, drip boards set in the gable ends and over windows and chimneys sited laterally on the roof ridges.

3.34 Trees and Hedgerows

- Mixed Woodland
  Dominant trees: oak, ash. Less common: wild cherry. Glades and near edges: field maple.
- Hedgerows, Woodland Edges and Scrub
  Hawthorn, hazel, blackthorn, dog rose, crab apple, field maple and, occasional, dogwood.
- Trees in Hedgerows
  Dominant: Oak. Sub-dominant: ash, field maple.
- Avenues
  Oak, lime, horse chestnut.
- Stream Sides
  Dominant: alder. Sub-dominant (not in mixes) white willow, crack willow, goat willow. Occasional: Guelder rose, dogwood. Occasional where not waterlogged: hazel, ash, oak.

Design Principles

3.35 Based on the above analysis of landscape settlement and built character, the following key design principles are set out:

- Maintain the distinctive, dispersed settlement pattern of farmsteads, cottages and small, detached houses along lanes, seeking to avoid infill.
- Maintain the distinctive settlement setting of Gamlingay, including; small stream valleys, woodlands, mature hedgerows and trees. Ensure new developments improve any existing harsh edges with a framework of new hedges, trees and woodland planting relating to local mixes.
- Maintain the traditional linear form of Gamlingay by limiting backland and cul-de-sac developments.
- Ensure buildings normally face the back edge of the pavements and are arranged to form mostly continuous frontages, with only occasional gaps.
- Ensure new developments reflect the form, scale and proportions of the existing vernacular buildings of the area and pick up on the traditional building styles, materials, colours and textures of the locality.
- Enclose boundaries facing onto roads by brick walls.
- Avoid the use of standardised and intrusive urban materials, street furniture, lighting and signage as part of traffic calming measures.
- Ensure large barns are sited and designed to minimise their bulk and impact on the wider landscape, normally relating them to existing groupings of farm buildings.

The Fen Edge

Parishes – Cottenham, Fen Drayton, Girton, Histon, Horningsea, Impington, Landbeach, Longstanton, Milton, Oakington, Over, Willingham, Rampton, Swavesey, Waterbeach, Westwick.

Landscape Character

3.36 This character area has a mostly flat, low-lying landscape with open views. However, scatterings of clumps of trees, poplar shelterbelts and occasional hedgerows sometimes merge together to give the sense of a more densely treed horizon. Straight running ‘lodes’, drains and north-south droves are distinctive features. The Great Ouse river and the ‘lodes’ are enclosed by raised banks, which sometimes provide valuable grassland habitats, or are marked by lines of willows. Low sand and gravel fen ‘islands’ rise above the flat landscape and have provided an historic focus for settlements. Smallholdings for market gardens, flower growing nurseries and orchards introduce additional local variety and interest in the landscape.

3.37 The key characteristics are:

- A low-lying, flat open landscape with extensive vistas.
- Large skies create drama.
- A hierarchy of streams, 'lodes', drains and ditches dissect the landscape.
- The rich and varied intensive agricultural land use includes a wide range of arable and horticultural crops and livestock.
- Orchards are a distinctive feature.
- Slightly elevated fen 'islands' have a higher proportion of grassland cover, trees and hedgerows.
- Small scale, irregular medieval field patterns are still visible around the edge of settlements.
- Church towers and spires create landmarks.

Settlement Character

3.38 The villages on the low fen islands are characterised by their strong linear form, often having developed outwards from crossroads along approach roads. The historic linear form is retained despite the modern estate developments that have occurred in many of the villages. Some village edges, such as at Cottenham, have a well wooded character, with hedgerows and mature trees concealing buildings, while others, such as Fen Drayton, have more open edges. Within the historic cores narrow lanes with continuous street frontages are typical, but on village edges buildings are more often setback with low walls and hedges fronting the streets. Long back gardens are also a common feature.

3.39 The key characteristics are:

- Historic cores of villages are located on the fen islands, although some modern development has spread onto low-lying land.
- Settlements sit low in the landscape, often screened by thick hedgerows to paddocks, copses, groups of mature trees and orchards.
- Strong linear form and street pattern.
- Narrow lanes with continuous street frontages create an intimate character.
- More loose knit arrangement of building facing the roads on some village approaches, with open areas and mature hedges interspersed.
- Occasional central medieval village greens formed from infilled historic docks and wharves.
- Clusters of glasshouses, farms, cottages and some modern detached houses are located along lanes.

3.40 Building and Materials

- Vernacular buildings are typically small scale, one and a half or two storeys in height. A few larger villas occur in some village core areas.
- Wall materials vary; yellow Gault clay brickwork predominates, but plastered timber-frame, dark stained weatherboarding and red brick are also present.
- Roofs are historically of thatch and plain clay tiles, with pantiles and Welsh slate being later introductions.
- Timber-frame building details include; steeply pitched roofs, side hung timber casements set flush to the outside face of the wall, drip boards set on gable ends and over the windows, with four or six panelled or planked doors.
- C 18th and C 19th house details include; vertically sliding sash windows set in reveals over shallow stone cills and with gauged or segmental arched brick lintels over, four or six panelled doors in simple classical door cases incorporating fan lights and chimneys incorporated within the buildings or at gable ends.
- Some brick buildings in the village cores have Dutch gables, reflecting the C 18th and C 19th links with the Low Countries.

3.41 Trees and Hedgerows

- Peat and Silt Fenland
  Ash, white willow, oak, field maple, birch, white poplar, hybrid black poplar, goat willow, grey willow, hawthorn, guelder rose, dogwood, horse chestnut, sycamore.
- Fen Islands
  Ash, oak, field maple, crab apple, wild cherry, white willow, goat willow, hawthorn, hazel, dogwood, blackthorn, wild privet.

<u>Design Principles</u>

3.42 Based on the above analysis of landscape settlement and built character, the following key design principles are set out:

- Ensure any village extensions are located on the high ground of the Fen Islands, avoiding incremental development on the flat, low-lying fen.
- Ensure new developments on the edges of villages are integrated by thick hedgerows, copses and shelterbelt planting reflecting the local mixes. Ensure a transition between Fen and Fen Island by retention and creation of small hedgerowed paddocks.
- Conserve and enhance existing orchard and hedgerowed paddocks.
- Maintain linear or rectilinear form of the settlements and avoid closes and cul-de-sacs.

- Ensure buildings are mostly set on the back edge of pavements, or face the street with small front gardens.
- Ensure new developments reflect the form, scale and proportions of the existing vernacular buildings of the area and pick up on the traditional building styles, materials, colours and textures of the locality.
- Enclose boundaries facing onto roads by low brick walls and/or simple iron railings or timber picket fences.
- Integrate water features, such as ditches dykes and ponds, into new developments as part of open spaces.
- Avoid the use of standardised and intrusive urban materials, street furniture, lighting and signage as part of traffic calming measures.

OUTLINE OF TRADITIONAL BUILDING FORMS AND ELEMENTS OF THE AREA

3.43 The vernacular architecture of a region is heavily influenced by the building materials available in that area, which in turn are related to the geology. The geology of South Cambridgeshire is outlined in Chapter 2, and basically comprises chalk in the southern parts of the District with clay further north.

3.44 This limited palette of materials gives traditional buildings a consistency of appearance despite their many periods and designs. This helps to identify and characterise the locality and our towns and villages.

Walling materials

Timber Frame

3.45 In South Cambridgeshire there is a distinct lack of good building stone and, therefore, the majority of early traditional buildings were constructed of timber-frame; the area once boasted a plentiful supply of good timber. The timber-frame construction in Eastern England was generally box framed in oak, with the timber studs set at close centres to produce vertical panels, as opposed to the square panels found in the Midlands. There is no tradition of cruck frames within this area.

3.46 Where the oak frame was exposed externally, the intervening panels were infilled using wattle and daub. This involved wattles of hazel being woven, basket fashion, around light oak staves fitted between the frames. The whole was then daubed on both sides with a mixture of clay, dung and chopped straw, and protected from the weather by a coat of limewash.

3.47 An unbroken weather protective cladding had several potential advantages over wattle and daub infill, and this led to the widespread use of lime plaster on riven wooden laths nailed to the outside face of the studs. The render

finish could be plain, decorated with a white or colour wash, or moulded into one of a number of patterns, known as pargetting. Decorative pargetting first appeared at the end of the 16th Century, though the technique reached its height of popularity in the latter half of the 17th Century and eventually fell out of favour in by the middle of the 18th Century. The patterns are often distinct from modern pargetting patterns. Historically pargetting was confined to the east of Cambridgeshire, along the Suffolk/Essex borders. Colours on rendered buildings are generally light and warm, often pale cream, but some buildings are painted pale pink or yellow and, occasionally, earthy red.

3.48 Weatherboard is typical of outbuildings and minor domestic buildings and extensions. Historically it was limewashed on houses and black tarred or left as natural oak or elm on outbuildings. The hierarchy of use on new buildings would be in accordance with this local tradition.

3.49 On lesser structures, such as cottages and agricultural buildings, timber weatherboarding provided an alternative cladding material to lime plaster. Weatherboarding is known to have been in use from around 1600, when oak or elm boards were pegged to the timber-frame. The use of deal (softwood) boards nailed to the studs dates from the latter part of the 18th Century. Deal needed protection from the elements but oak and elm could be left un-painted. The boards were limewashed on cottages and mills, but black tarred on outbuildings and agricultural buildings.

Brickwork

3.50 The Romans first introduced the art of brick making into Britain, but this knowledge was lost in the Dark Ages. Following the introduction of brick making from the continent, bricks began to be used again in Britain during the 17th Century. Initially there were isolated examples of narrow red bricks imported to Cambridgeshire to be used on high status buildings. This was followed by the use of local Gault clay for the manufacture of bricks, originally using narrow dimensions similar to the imported bricks. From the 18th Century onwards there is an increasing use of brickwork in the region.

3.51 The early local bricks were a ‘white’ brick that weathered grey then later, in the 19th Century, manufacture of the characteristic yellow ‘Cambridge stock’ brick commenced.

3.52 Traditional brick walls were constructed using Flemish bond, English bond or, sometimes, English Garden Wall bond (all of which incorporate headers into the visible pattern). The use of stretcher bond only developed in the 20th Century, in parallel with the development of the cavity wall. Other traditional details include the use of cut arches or oak lintols over openings and a traditional flexible lime mortar avoiding the need for movement joints.

Unfired Brickwork

3.53 The glacial boulder clay that overlies the chalk in the south-east area of the District was used predominately during the eighteenth and early nineteenth centuries to produce a form of unfired brickwork used in walling, known as clay-batt or clay lump. The process involved digging out the clay, removing the flints and other large stones, mixing it with chopped straw, then compressing the mixture into wooden moulds before leaving it for several weeks to dry out. Clay batts were time-consuming but cheap to produce, and a good insulant. The 'bricks' were much larger than a fired brick, at around 450mm long, by between 125 and 225mm high and 150mm thick. The external face of a clay-batt wall needed protection from the elements; on agricultural buildings this was often by a coat of tar. Tar could also used on cottages, in which case it was generally sanded and colour-washed, but it was equally as common for cottages to be rendered in a lime plaster.

Stone

3.54 The chalk that underlies much of the district does not make a particularly good, or durable walling material. Chalk is a form of particularly pure limestone, it is very soft, which means it is easy to work, but is vulnerable to rapid weathering, especially in a polluted atmosphere. Within the lower Chalk beds of Cambridgeshire the chalk is more compacted than that found elsewhere in south-east England and this has enabled it to be used as a building stone, known as clunch. The qualities of the stone made it possible for the chalk to be cut into squared, ashlar blocks, and it was widely used for internal walls, arcades and capitals in churches, but equally, if carefully detailed and protected by render or limewash, or under good roof overhangs, it could be used externally.

3.55 The flints which occur naturally within the local chalk are much more durable than clunch, but are extremely difficult to work. The rounded nodules of flint are also difficult to bond and to terminate at window and door openings. Therefore, when flint is used for walling, the nodules of flint are often set in relatively thick mortar beds and combined with brickwork or ashlar stonework to frame rectangular openings for windows and doorways, and to turn corners. Where a truer face is required to the wall, one side of the flint nodule may be crudely faced or knapped. Flint is usually laid in courses, sometimes only noticeable when viewed close to along the wall. In South Cambridgeshire flint is frequently used in the construction of churches, but is not so widely used for secular buildings as in other chalk areas. It is more generally confined to boundary walls and the occasional cottage, and then often dates from the nineteenth century.

3.56 The outcrop of Greensand hardly makes an impression on South Cambridgeshire and it is only significant in the west of the District around the village of Gamlingay. Here the parish church is built of Greensand, but otherwise it is not used as a building stone.

3.57 Stones such as Bath and Ketton stone were imported to the area primarily during the eighteenth and nineteenth centuries for weathering and architectural detailing on brick-built higher status buildings, such as schools, chapels and larger houses. Combinations of stone detailing and render walls are not traditional as the render generally signifies a timber frame.

Roofing materials

Thatch

3.58 Thatch has been widely used throughout South Cambridgeshire. Long straw is the traditional material used throughout most of the District, although some water reed has always been used on the fen-edge. In more recent times there has been an increase in the use of reed over long straw, due to the greater longevity and availability of imported reed. It is important that the long straw tradition is maintained within the District since it has a distinctive character and produces a roof that is visually different to one covered in reed. One very obvious difference between the two materials is in the detailing of the ridge. Reed is stiff and brittle, and cannot be bent over a ridge. Therefore, on a reed thatch roof the ridge is formed with an additional layer of thatch along the ridge, using sedge, tough grass or straw (that may incorporate decorative embellishments to its lower edge). A true long straw thatch roof on the other hand has a simple, unadorned ridge. All thatch roofs are steeply pitched, at 50 degrees and over.

Tile

3.59 Roofing tiles used within the region are produced in two forms; Plain tile (peg tile), which are relatively small and are laid with double lap on moderately steep pitches (40 to 50 degrees), and pan-tiles, which are larger and are laid with a single lap at shallower pitches (35 to 45 degrees). Production of roofing tiles from the Gault Clay of the District dates back to the 15th Century for peg-tiles, with clay pan-tiles becoming widespread from the 18th Century. Plain tile was the most expensive local roofing material and therefore used for higher status buildings. Pantile was used traditionally for outbuildings and smaller houses. Machine-made plain tiles were introduced during the mid nineteenth century and have a flatter appearance and noticeably more mechanical character than hand made tiles.

Slate

3.60 The continued use of thatch perpetuated the risk from fire, especially within the densely built up village centres, and there remained a need for a readily available source of cheap, durable and non-flammable roofing material, as well as a desire to roof over shallow pitches. After the introduction of the railways in the middle of the 19th Century, Welsh slate was able to fulfil this need and became widely used throughout the District (where it is laid at pitches as low as 25 degrees). The resulting low-pitched roofs are characteristic of Georgian and Victorian buildings. Slate used in South Cambridgeshire is therefore a distinctive Welsh mid grey or grey-pink colour rather than the dark grey and black seen on foreign imported slates.

Timber

3.61 Timber shingles are used for outbuildings and garden buildings and can be used at very low pitches. Imported materials like cedar weather differently to traditional local materials such as oak and can be more vulnerable to attack by woodpeckers. Hand-cut shingles have more texture and stability and can be used at lower pitches than machine-cut.

Metal

3.62 Corrugated iron is often found as a temporary material on roofs that have failed. It is characteristically cheap but sometimes appropriate at very shallow pitches or to provide an industrial or agricultural character.

3.63 Lead was rarely used prior to the eighteenth century other than on churches. It is characteristic of high status buildings, usually laid to an almost-flat slope. Early lead was cast, but during the nineteenth century milled lead was developed which was thinner and cheaper. Terne-coated stainless steel has a similar colour, though it is thinner, and is sometimes a modern alternative where there is a problem with theft of lead.

3.64 Copper was rarely used prior to the nineteenth century and is not characteristic of traditional buildings of the area. It was popular during the Arts and Crafts period and weathers to a distinctive bright green.

Felt and asphalt

3.65 Typical of lower status twentieth and twenty-first century flat roofs, they require much higher maintenance than traditional materials.

Glass

3.66 Glass roofs are typical of greenhouses of the late nineteenth century and later when glass could be manufactured more reliably and in larger sizes.

Less traditional glass roofs are characteristic of the late twentieth century onwards. Glass pantiles were used in the late nineteenth and early twentieth century to light outbuildings and agricultural buildings.

Diagram illustrating different roof pitches for different materials.

Details

Windows

3.67 Windows were generally of timber and their design was closely associated with developments in the techniques of glass making. Up until the end of 16th Century glass was too expensive for use in all but the grandest of houses, so windows in smaller houses were frequently left un-glazed with wooden shutters introduced during the latter half of the 17th Century. Early glass could only be produced in very small panes and early windows comprised pieces of glass in lead cames set in wrought iron frames and fitted into an outer timber frame. This timber frame was in oak, elm or chestnut and was often left untreated. As the use of glass became more common, leaded lights were frequently retrofitted into older buildings.

3.68 From the mid 17th and early 18th centuries onwards, the design of windows began to reflect classical styles. Good quality softwood became the predominant material, decorated with paint or (occasionally) graining.

3.69 Square openings in vernacular buildings were generally fitted with side-hung or horizontal sliding ('Yorkshire') timber casements which had wooden glazing bars used to subdivide each casement. The casements were set level with or behind their frame, unlike the modern 'storm casement'.

3.70 Vertical sliding sash windows were first introduced at the end of the 17th Century. The earliest sash windows were in painted oak rather than softwood with wide ovolo glazing bars and generally had their top casement fixed shut. The section of the glazing bars became more refined over time and varieties such as lamb tongue mouldings were introduced.

3.71 Throughout the 18th Century the pattern of sash windows generally remained that of 6 panes to each sash (6 over 6). Around the middle of the 19th Century advances in glass production enabled the pane size to be increased and the subdivision of sash windows simplified; initially to 3 over 3, then later to 2 over 2 and, finally, to a single, large pane in each sash. These larger panes were of thicker glass, and therefore heavier. In order to carry this additional weight the frames needed to be strengthened, and this led to the use of horns on the sashes from the middle of the 19th Century onwards.

3.72 Often a mix of window types is found. This often shows the hierarchy of the building; with newer styles of windows in the main reception and higher status rooms and earlier styles of windows in ancillary and subservient lower status spaces.

3.73 During the Tudor Revival of the late 19th and early 20th centuries, there was a short-lived re-introduction of iron frames in untreated oak frames, to reflect the period style of the building.

3.74 Cast iron windows in distinctive decorative patterns were also introduced in the late nineteenth century. Where found, it is important they are retained, but they are difficult to reproduce.

3.75 Steel windows and doors date from the early 20th Century onwards and are characteristic of modernist and minimalist designs.

Doors

3.76 The entrance door evolved with two functions in mind; defence - whether it be against human invaders or the wind and rain, and display - emphasising the house owner's position in the world. Because doors have been, to some extent, a symbol of prestige, they have also been influenced by the prevailing fashion of the time.

3.77 Early doors were often defensive in character, constructed of heavy oak planks, smoothed with an adze, and fastened onto horizontal boards. The two faces were secured with wooden pegs or iron studs and the doors were hung on strap hinges, with iron pins seated directly in the timber surround to the door and no intervening doorframe. Security was achieved through the use of an internal draw-bar, with no handle or knob on the outside.

3.78 In the 17th Century the basic construction did not change, but the number of vertical planks to each door increased and the edges were sometimes moulded as the planks themselves became narrower and defence gave way to decoration. External fastenings were introduced, normally a heavy iron ring-pull. Whilst in some buildings there was still no separate doorframe, in others the door closed flush against a heavy timber frame.

3.79 Towards the end of the 17th Century, these boarded doors evolved into ledged doors where, instead of a double layer of timber, the vertical boards were supported by three horizontal ledges on the internal face. The earliest ledges were relatively thin. Later doors had thicker ledges and became the ledged and braced door that remained in widespread use right up to the middle of the 20th Century, especially for subservient rooms and rural and less fashionable buildings. The diagonal braces provided additional strength and rigidity. Simple strap hinges connected the flush face to a rebated timber doorframe with metal ‘Suffolk’ type latches as the most

common type of fastening. Strap hinge details varied over the centuries and their position moved from outside to the inside of the door. Likewise the planks were originally butt-jointed, often with a small bead moulding on the joint. This gradually evolved during the 20th Century to tongue and groove.

3.80 In the eighteenth Century the revival of interest in the architecture of Greece and Rome resulted in a sophisticated and elegant architectural style within which the panelled doors became the norm. Details of the panels varied widely, but the six-panelled version became the most common. Some panels were flush with the stiles and rails others were raised and fielded. Hinges had to be unobtrusive, so as not to spoil the effect, and often H or L type hinges were used. Internally, the door no longer opened into a main room but into a smaller hallway and fanlights over the door allowed light to reach this internal space. The classical doorcase, with pilaster and pediment (triangular or segmental), emphasised the social significance of the door. Door 'furniture' became more elaborate with knockers, door knobs and eventually letter-boxes, all normally made of brass. Boot scrapers outside the door protected the polished floors and rugs inside. In the 19th Century the number of panels gradually diminished until four-panelled doors became the most usual type. One large raised and fielded panel at the bottom was not, however, uncommon, particularly in the latter part of the century. Overall the effect was chunkier and more 'solid' than the elegance of the 18th Century. Fanlights too became simpler, with plain rectangles or arches replacing the delicate tracery of the earlier doors. A greater variety of door furniture was used, with iron and, on occasion, glass or porcelain, added to the familiar brass. The door was hung from butt hinges, familiar to those still used today.

Lintels and Cills

3.81 The detailing of the lintels and cills was an integral part of window and door design. On the more humble vernacular buildings lintels were generally formed from timber, though on brick structures a simple, segmental ('curved') brick arch was also frequently used externally, in combination with a timber internal lintel. On grander brick buildings rubbed bricks (specially shaped soft bricks with very fined joints) were sometimes used to form flat arches over the window heads. Alternatively in the late 19th and early 20th Centuries, imported dressed stone could be used for both the lintels and cills of masonry buildings. In brick or stone walls, windows and doors are set back from the outer face of the wall for protection against weather, with the exception of the late 17th Century and earlier when doors and windows were set level with the outer face of brickwork. In rendered and weatherboarded walls, windows and doors were set level with the outside face, using a timber pentice board over the head to shed water and occasionally also with an architrave. The main door sometimes had a hoodmould or canopy instead of a simpler pentice board.

Dormers and Rooflights

3.82 Dormers are traditionally modest, forming only minor incidents in the roof slope. The exceptions are classically designed grand houses of the early 18th Century where they were used to emphasise the verticality and height of the building, and late 19th century 'Arts and Crafts' buildings where they emphasise the designed articulation of a roof.

3.83 A number of traditional buildings in the district are either 1½ or 2½ storeys, with gable end windows and a limited number of dormer windows used to light the rooms that extend into the roof space. Most dormers are relatively narrow (i.e two casements wide) and have simple gabled roofs, though on steeply pitched roofs (and particularly on the fen margins) catslide dormers are also not uncommon. Dormers introduced into thatched roofs are generally 'eyebrow' type, though sometimes they may be gabled and roofed in plain tile or slate.

3.84 On grander houses the dormers may have flat, or gently arched, roofs covered in lead, which on later 'Arts and Crafts' houses could also have a significant horizontal emphasis.

3.85 Rooflights were generally not used to light habitable rooms, but could be used to light roof spaces used for storage. These rooflights are traditionally relatively small, made of wrought iron or cast iron, with a central vertical iron glazing bar, and are unobtrusively located on the rear slopes, or behind parapets.

Eaves and Verges

3.86 Traditionally, eaves and verges in South Cambridgeshire are kept very simple and are cut back tight to the building without fascias, soffits or bargeboards. Where the eaves extend beyond the line of the wall (more commonly found on timber-framed structures), this is normally detailed as an 'open eaves' with exposed sprockets to the rafter feet. Brick buildings often incorporate decorative dentil courses under the eaves and, sometimes, 'tumbled' brickwork to the verges or chimneystacks. Later Victorian structures may also incorporate verges that project beyond the line of the wall below and these often include decoratively shaped bargeboards.

Chimneys

3.87 The introduction of chimneys dates form the medieval period, when flues and chimneystacks were first used to funnel smoke from fires. They only became widely used during the late 16th and 17th Century when the stack was often surmounted by freestanding shafts, usually circular in plan or set

diagonally. During the 18th and 19th Centuries, the number of rooms with fireplaces increased resulting in more and larger stacks; classical details such as cornices, stringcourses and plinths were also widely used. Chimney pots were introduced on top of the stack in the 18th Century. These early pots were plain and of modest proportions. In the 19th Century pots became taller, with more elaborate profiles and decorative features.

3.88 Chimneystacks were generally located on gable ends or centrally on the ridge, especially on more modest dwellings. Where stacks were located on gables, it was normal for them to again be placed centrally, such that the flue terminated inline with the ridge, and with the stack flush to the outside face of the gable.

Rainwater Goods

3.89 Rainwater goods include; gutters, downpipes, rainwater heads, spouts, and gulleys. They not only protect walls from water penetration, but also contribute to a building's design, giving vertical emphasis, horizontal definition and decoration. The earliest surviving examples of rainwater goods are stone gargoyles and spouts found on medieval buildings, especially churches. Gutters and downpipes were not generally applied to secular buildings until the mid 18th Century. Before then, wide overhanging eaves of thatched and clay tile roofs provided protection by shedding water away from walls. During the 18th Century it became fashionable to incorporate gutters either in classical cornices, or concealed behind a parapet wall. These gutters were then connected to lead downpipes via lead rainwater heads, which were often elaborately decorated with mouldings, heraldic devices, initials and dates.

3.90 Early guttering was generally made from wood, of simple, square, or ogee box section with minimal decoration and attached to walls beneath the eaves, supported by either wrought iron or steel brackets, or set on brick or stone corbels, or occasionally partly recessed into the wall. Cast iron became available from about 1750, from when cast iron rainwater heads similar to decorative lead goods bearing dates and initials, can be found. The mass production of cast iron gutters and downpipes dates from the early years of 19th Century and it became the most common material for rainwater goods from the mid 19th Century until the 1950s. More recently cast aluminium has been available as a lighter alternative with a similar appearance to cast iron.

Plan Form

3.91 The traditional plan form of the area was for wide frontage cottages of shallow depth (i.e. single room deep and a maximum of 6 metres). These spans are limited historically by the sizes of timber. A span of 5 to 6 metres is common and larger buildings are made from multiples of this. These

multiples of the traditional span are clearly identifiable in the external appearance of the building, such as by using a double pile roof or aisled form.

3.92 The earliest buildings have simple rectangular forms with single room depth plans. A few highest status buildings have aisles to increase the internal volume and later more commonly cross-wings are incorporated. The simple rectangular single storey to one-and-a-half storey form continues as the most common form of building in later centuries.

3.93 Many traditional cottages follow a 'baffle entry' form, in which there is central stack (usually with two fireplaces back to back) and the main entry door sited on the side of the stack, creating a lobby between the two rooms. Access to first floor was generally via a staircase sited on the opposite side of the stack, but the stairs could also be contained within an outshut to the rear.

3.94 Larger houses from the 18th Century onwards frequently made use of the 'double pile' plan form, in which there are two parallel ranges, resulting in four rooms being provided on each floor, together with a centrally placed front door and a staircase located between the two rooms on the rear elevation. These double pile arrangements are characteristic of higher and mid-status buildings such as manor houses, vicarages, farmhouses and villas.

3.95 This house type was later to be used as the model for the narrow fronted, Victorian terraced cottages that are also two rooms deep but only one room wide, with further accommodation contained in outshuts to the rear. Examples of these are generally to be found within the larger villages, especially those that experienced rapid growth during the 19th Century.

3.96 Extensions to buildings follow simple traditional additive forms; as attached cross-wings, lower parallel ranges, gables and lean-tos. Double pile roofs to reduce the apparent depth of a deep-span building are too complex for simple vernacular buildings and domestic outbuildings. The additions are clearly identifiable on the elevations and have subservient forms, being lower and narrower than the original building.

The Language of Buildings

3.97 Chapter 3 describes the particular characteristics of settlements, buildings and materials found in different areas of South Cambridgeshire; and describes materials and details that are traditional and distinctive to the district.

3.98 The Listed Buildings SPD (Chapter 15, pages 119 - 126) highlights specific building types within South Cambridgeshire. These include farm buildings

including barns, granaries, stables, dovecotes, and cart and stock sheds. The importance of food processing, as well as agriculture, to the district is reflected by mills and maltings. Traditional crafts and industries are represented by smithies and tanneries. Bake houses and wash houses, schools and war memorials are also included.

3.99 Alongside the details and building types that are typical of an area, buildings speak a language which comes from:

- The relationship between their type, form, function, status and other aspects
- Their general architectural qualities

The Relationship Between a Building's Form, Function, Date, Status and Other Aspects

3.100 In this section relationships between different aspects are considered separately. In reality, all the aspects work together in the design of buildings and contribute to the meanings they convey.

3.101 Schools are examples of how buildings' functions are reflected in their forms. Parts of Victorian and Edwardian schools are often divided equally between girls and boys. Tall windows and high ceilings give good light for reading and writing.

3.102 Industrial buildings are often characterised by limited openings or individual large openings in isolated positions such as patent glazing in a roof of nineteenth or twentieth century buildings or as high level groups of wall glazing.

3.103 Functions of buildings are reflected in their details. For example, the louvred panels of drying sheds encourage the passage of air. Granaries are lifted up on staddle stones to keep the rats at bay, and the brick walls of sties are robust enough to limit damage from the snouts and trotters of pigs. Farm buildings such as barns are characterised by having no windows. When work was being carried out, the doors could be opened and the amount of ventilation and light controlled. The presence of vents and slats in a farm building gives an indication animals were kept in it.

3.104 Details also reflect the properties of the materials used to keep a building weathertight and relatively warm and light. For example, thatch roofs have wide eaves to throw rain water away from the building. Clay bat walls need a 'good hat and boots'.

3.105 The different use and status of buildings is reflected in their construction and materials. For example, a house built with tiles and bricks may have

outbuildings with humbler and cheaper pantile roofs and timber-framed walls.

3.106 Differences in wealth and status are reflected in the houses of the district. (What we have inherited tells only part of story as many poorer cottages and workshops were cleared in the past.)

(Cottenham as illustration of those differences with houses built at a similar time)

3.107 Parish churches were centres of the village with the building and churchyard used for a range of community and other activities. They could be well supported by the local landowner and receive other donations and funds. The status of churches is reflected in their positions in the village and the settings they enjoy, their ambition and impact, and the quality of materials and craftsmanship. In many cases, the church is the focus of the settlement – other buildings are grouped around it; its tower is the tallest structure in the group; and it is prominent in views.

3.108 Chapels, by contrast, are normally less prominent and tended to be built amongst the houses of the working class. Their often modest designs and materials reflected nonconformist beliefs as well the limited resources of chapel communities.

3.109 Ownership and influence is reflected in the design of buildings. Landowner controlled villages could be smaller and neater than the more haphazard 'open villages' and can feature characteristic estate cottages. Landowners demolished villages to make way for new landscaped parks and planned villages could be built to replace them.

(Wimpole and C)

3.110 Different types of shared purpose and community action are reflected in almshouses, buildings associated with land settlement movements, and the village halls built as part of the self-help movement in the 1930s. Public and private ownership and influence are reflected in the designs of council and social housing, and those built by builders and private developers.

3.111 Finally, buildings reflect the period they were built, through architectural fashion, developments in design, the materials available locally and from further afield, prosperity or depression, or changing needs and solutions.

Architectural Qualities

3.112 There are a number of general architectural qualities that come together in the design of a building and help convey a range of messages and meanings.

3.113 The sheer size of a building is important but this is most often read and measured in relation to other buildings or features. The relative size of buildings and their parts is called scale.

3.114 The shapes of buildings are described as their forms. Massing of buildings often refers to the way different forms are combined together.

3.115 Proportion describes the relationship of one dimension or area to another. The proportions of a rectangle come from the relationship between the length of the long and short sides. Different proportions give different messages and some have a special balance or beauty.

3.116 Different proportions also give a building (or building element) a stronger or weaker vertical or horizontal emphasis. Buildings with horizontal proportions can be seen as hugging the ground while those with vertical proportions take the eye up to the sky. The elements and details of a building can reinforce or play against these overall emphases. These elevational rhythms should clearly reflect context. For instance, many traditional buildings have horizontal proportions for walls but vertical proportions for windows.

3.117 The proportions of the plans of buildings (the relationship of length to depth) and the proportions of cross sections (height to depth) are important, as is their shape and division. The plans of traditional houses in the district often had long walls running parallel to the street but were shallow in depth. Sections of vernacular house were often tall and narrow, and roof pitches were often steep, particularly those designed for thatch.

(Illustration of lobby entry and double banked house)

3.118 The impact of one part of a building relative to another is an important part of a building's expression. For example, a large roof which runs down to a low eaves can dominate a smaller area of wall below. Or walls can be dominant, with the impact of roofs reduced by screening parapets. Details emphasis these relationships: eaves and verges with deep overhangs make roofs more dominant.

3.119 Similarly, certain elements of a building – usually those most important and which the owner, builder or architect wants to highlight – are more prominent than others.

3.120 The way that the elements of a building, particularly doors and windows, are positioned is also a form of expression. (The windows and door at the front of a house have been compared to the eyes and mouth of a face.) A symmetrical balance of openings conveys a different message to other formal or informal arrangements.

3.121 The degree of uniformity or variety in a building is an important part of its expression and is closely related to its function and meaning. Uniformity, for example, can suggest organization and discipline and has traditionally been used for military and institutional buildings.

3.122 Buildings with too much uniformity can appear dull and over-regimented and those with excessive variety, can seem haphazard and unsettling. Good architecture often combines and plays off the regular and irregular, the expected and the unexpected.

3.123 Buildings also have and combine different degrees of decoration and complexity. Traditionally, complex buildings are often of higher status than those that are simpler. Again the contrast between simplicity and complexity can be used to good effect.

3.124 Different materials inspire very different feelings. For example, stone walls can give a sense of strength and weight. Combinations of materials can make use of these differences so that a 'heavy' masonry plinth supports a 'light' timber frame wall above. Selected well, they can add to the sculptural qualities and interest of a building.

3.125 The way individual materials are used also increases or changes our associations and perceptions. Stone transformed into the delicate tracery of gothic windows creates a different feel to when it is used in massive castle ramparts. Deep window and door reveals can reflect or suggest a thicker wall and weight.

3.126 The ratio of wall to windows and doors is also important in terms of suggesting weight and how open, and even welcoming, a building is.

3.127 These architectural qualities combine with the relationship between a building's form, function, date, status and the other aspects described in the last section to give expression and meaning to a building. This is further enhanced by the 'patterns of buildings' considered next.

Patterns of Buildings

3.128 This section looks at how buildings relate to each other and to the layouts of our villages.

3.129 Much of the character of villages is given by the patterns of streets, plots and buildings. The streets and open spaces create the 'skeleton' of a village and can remain little changed for centuries. The division of the land next to historic streets into plots is often long lived but is likely to change more frequently than the streets. At a smaller level of scale are the buildings that occupy the plots. These are more likely to be replaced or changed than the

plots though some buildings outlive them. Extensive redevelopment can sweep away this historic pattern.

3.130 The structures of villages can be compact, for example organized around a green, or linear, with buildings set alongside a single road. Most settlements are more complex than these standard models and can combine elements of both and have a number of centres. Villages reflect centuries of dynamic change in response to wide range of factors. As each settlement has its own set of circumstances, so each village is unique and special.

3.131 Different sizes and shapes of plots give places a very different feel. Medieval plots were typically long and relatively thin, and could lead on to a back lane and common fields beyond. There is an architectural hierarchy reflecting the social hierarchy within settlements, whereby the plots and major buildings such as manor houses and vicarages are traditionally larger.

3.132 Plot divisions in at least the same street were often reasonably regular. In many places more variety is given by the buildings which fill them. Unlike modern estates, it was unusual in rural villages for whole streets or areas to be built by the same people and at the same time. Individual houses or short terraces were constructed by different people at different times. The variety of buildings found in most traditional villages is a key part of their character and appeal. The mix of historic building types and uses adds to that variety.

3.133 The way buildings sit on plots makes a big difference to their settings and the way they are perceived and to sense of space and character of streets and villages. Many historic buildings were on or close to the street. Detached houses often had generous space either side. Where plots were less wide, then houses would be more likely to be joined together. This contrasts with modern suburban developments where houses are set back and individual or semi-detached houses can have relatively little space between them. Whether traditional houses form terraces or are individual buildings obviously affects their design and ability to change and extend over time.

3.134 In general, within the centre or centres of villages, buildings characteristically define the edge of the public realm, usually the road edge or the edge of a Green. Typically the front elevation and line of the main roof follow the direction of the street. Within some villages, such as Cottenham, occasional buildings are located perpendicular to the road with a prominent gable in the streetscape. Frontage buildings within settlements are usually the major buildings, unless they are part of a farm group where the farmhouse is often set back beyond a courtyard of farm buildings.

3.135 Beyond the main frontage buildings, the outbuildings are subservient and often orientated to follow the site boundaries at 90 degrees to the main building, becoming smaller as they become further from the main building. Farmsteads within villages often extend further to the rear of the street frontage than other development and this distinction should be retained rather than used as a general building line.

3.136 Towards the edges of villages, development is generally more open and the building line of development is often set back further from the road edge. It usually still follows the direction of the street but provides less enclosure. The front garden and the front boundary are more prominent and important in the streetscape. The front boundary changes character, often from walls and picket fences typically closer to the village centre to hedges leading towards the open countryside.

3.137 The size, shape, position and orientation of buildings in the streetscape will define the 'weave' of the built fabric. For example, detached buildings which are placed in the centre of larger width plots define a looser-knit settlement pattern than lines of terraced houses. Also, buildings which directly front on to the pavement generally define a narrower street and more enclosure than buildings set back with front gardens and garden walls.

3.138 Along with the variety of buildings already mentioned, their grouping, for example along a street or around a green, creates distinctive and attractive places. Farmsteads are an example of buildings and structures of different but related functions found on the same large plot. A variety of different forms come together with buildings arranged to reflect the hierarchy of uses and the way the buildings and the whole farmstead works.

3.139 The relationship of the farmstead and its buildings to the countryside can be that of enclosure with a courtyard, or of openness to the fields, or its relationship can be within a larger settlement. Rural groups and some buildings close-by on the edge of a village have a specific character and landscape quality in which fields and trees predominate. Views can be more open and far-reaching with softer and less solid boundaries such as traditional hedges and simple open fencing such as post and rail.

3.140 While this section has concentrated on streets, plots and buildings, villages should always be seen within their wider landscape setting. Dividing villages from the countryside that surrounds them ignores history and is unhelpful at best. Rural communities were supported by agriculture with most people working on the land or in related trades. The countryside needed to be easily accessible from the village and the fields, common land, meadows and woods all supplied different needs. Villages should always been seen as part of and indivisible from the countryside.

CHAPTER 4

ENVIRONMENTAL SUSTAINABILITY

4.1 Sustainability should be at the heart of good design within the creative process of developing or reshaping our built environment (structures and infrastructure). In the fullest sense this embodies the three principles of i.) concurrency – meeting current needs; ii.) Resilience – lasting in the face of change, and; iii.) adaptability – being able to adjust to future needs.

4.2 Underlying each of these is the need to effectively and fairly manage our use of the Earth's resources so that present and future generations can live within the planet's to support us all. This approach lies at the heart of what is termed 'environmental sustainability' and is perhaps most easily communicated through the concept of 'one-planet living'. We are currently exceeding this threshold. If everyone in the world lived as we do in the United Kingdom we would require the natural resources of at least three planet Earths. This relationship between the productive land area required to support our lifestyles and the amount of productive land that could be evenly allocated to each man, woman and child on the earth is referred to as our ecological or environmental footprint. In South Cambridgeshire the average ecological footprint per resident is 5.3 global hectares (this is 'actual' hectares adjusted for land type and quality), a figure which very seriously exceeds the average 'earthshare' of 1.8 global hectares per person. This is clearly unsustainable in the broadest sense of the word.

4.3 Apart from eroding the Earth's natural capital we have also, through the extensive and almost exclusive use of fossil fuels to power our lives, released (and continue to release) excessive quantities of carbon dioxide (CO_2) and other greenhouse gases into our atmosphere. This is enhancing the global greenhouse effect to the point where our climate is destabilising and changing in increasingly threatening ways. This parameter is often referred to as our 'carbon footprint' and can be expressed in tons of CO_2 per capita of population. In terms of local emissions in South Cambridgeshire, Central Government has calculated the average figure as 10.2 tons CO_2/person/year (2006). To meet Local Area Agreement targets this must be 9 tons by 2011 and to meet Central Government targets we would be looking at 6-7 tons by 2020 and no more than 2 tons by 2050.

4.4 The gravity of the over-exploitation of environmental resources and climate change – and its implications – is now accepted by most scientists and politicians. Together they dominate, and will continue to dominate, the 21st Century concept of environmental sustainability. Many of the technological solutions to mitigate the situation already exist. The challenge for sustainable design and construction professionals (and the institutions that support them) is to ensure that this crucial sector does not fail in its responsibilities of ensuring that the transition to low carbon sustainable

living is made within the pressing timeframes required (CO_2 emissions must peak by around 2016 and then decrease year on year by at least 3-4%).

4.5 The understanding and sphere of influence of both of these components has swollen dramatically over the past five years, as the planning system has found it necessary to re-evaluate what it means to protect and enhance the environment and to use natural resources prudently.

4.6 The rapidity with which the imperatives of environmental sustainability have collided with the world of design and construction presents a challenge to architects, urban designers, quantity surveyors, policy makers, developers and builders scrabbling to keep up in terms of skills, knowledge, budget and management.

4.7 Sustainable design and construction are now a key concern of the planning system. The environmental sustainability design criteria raised and discussed within the following text are fundamental to twenty-first Century design and must be included from the outset of any development and planning application process.

THE DEVELOPING POLICY CONTEXT

4.8 As the extent and urgency of the environmental sustainability agenda has been recognised, so planning policy has developed by way of response. The relevant principles behind South Cambridgeshire's Local Development Framework (LDF) current Core and Development Control Policies have hardened nationally and regionally since they were adopted – especially in terms of target setting and how they should be delivered in practice.

4.9 The fundamental sustainable design and construction parameters of planning for a lasting built environment still hold, but the context and pressure has changed with a new and urgent focus on reducing carbon emissions, decentralised energy, water conservation and climate change adaptation. Since the adoption of the Development Control Policies DPD in July 2007, new important drivers have subsequently been formally brought forward. These stand to strengthen the role and relevance of environmental sustainability in land-use decision making. As additional or revised accountabilities they reflect the priority and urgency that is now attached to tackling the imperatives of the climate change agenda. Of these the following have been specifically taken account of in subsequent section of this guidance:

- Planning and Climate Change Supplement to Planning Policy Statement 1 (December 2007)
- Government policy commitment to modify the Building Regulations to achieve zero carbon homes by 2016 and zero carbon buildings by 2019 (Building a Greener Future, July 2007)
- Definition of zero carbon homes (consultation closed March 2009)

- UK Renewable Energy Strategy (July 2009)
- Heat and Energy Saving Strategy (consultation closed May 2009)
- UK Low Carbon Transition Plan (July 2009)
- Code for Sustainable Homes: Technical Guide (May 2009)
- EU Energy Performance of Buildings Directive (October 2008)
- Cambridgeshire Together Local Area Agreement Targets on climate change (2008-2011)

CHAPTER 5

BIODIVERSITY

5.1 Biodiversity is the word used to describe all flora and fauna and it is important that any development proposal considers the impact it will have upon wildlife or biodiversity. In recent years much effort has been placed upon the production of Biodiversity Action Plans to guide this conservation effort.

5.2 The Natural Environment and Rural Communities Act 2006 and UK Biodiversity Action Plans provide guidance on the range of habitats and species important for the protection, conservation and further enhancement across the District.

5.3 The UK Biodiversity Action Plan (BAP) is the means by which the Government sets out to fulfil its international biodiversity obligations. The UK BAP encompasses 1,150 species and 65 habitats that are considered to be rare, declining or in need of some protection to ensure their long-term survival (www.ukbap.org.uk). The Cambridgeshire local BAP consists of a total of 45 plans; with 27 Habitat Action Plans and 17 Species Action Plans. Five broad habitat themes encapsulate the specific species and habitat action plans. The habitat themes are:

- Rivers and Wetlands
- Trees and Woodlands
- Farmland
- Cities, Towns and Villages
- Dry Grasslands

A full set of plans can be viewed at http://www.ukbap.org.uk/lbap.aspx?ID=370.

5.4 Development should contribute to the protection and further enhancement of the national and local Biodiversity Action Plans whilst Protected Species should be fully conserved.

5.5 Biodiversity and sustainable development sit side-by-side. Sustainable developments should aim to have a minimal impact upon the environment. Where change is unavoidable new opportunities may present themselves for habitat enhancement or creation.

5.6 For more information refer to the Council's Biodiversity SPD.

PART II

BASIC DESIGN CRITERIA

South Cambridgeshire consists of villages and rural settlements within open countryside, rather than towns and large urban contexts. This modest scale and rural setting is the basis of the local distinctiveness which shows in the type, scale, density, details, materials and spaces characteristic of the existing settlements.

The district has a demand for new development either as part of existing settlements, in rural sites in open countryside, and as large scale new towns. Their design needs to create viable and vibrant spaces and buildings that also respect, preserve and enhance the special character of South Cambridgeshire.

The aim of this Chapter is therefore to identify important design criteria for this new development in urban and rural contexts.

CHAPTER 6

URBAN DESIGN

GENERAL INTRODUCTION

6.1 Good urban design addresses the interface between all the issues that influence the form and use of urban settlements, in order to create successful places where people want to live, work, visit and which supports their needs. The purpose of urban design is to create good quality places, rather than just the provision of developments.

6.2 Urban design principles apply to all form forms of development. For even one single house to be provided in an existing street, it will be best designed to integrate into its surroundings if urban design principles are followed. This chapter focuses on the full range of urban design principles that apply, in full or part, to all development proposals and addresses larger development proposals. Part III focuses specifically on the issues that are encountered with smaller scale developments of less than about 10 houses, or have a floor area of less than 500m², or a site area of less than 0.5 of a hectare.

6.3 Prior to any design work being undertaken, it is essential that the site is fully understood in its context. It must be fully understood how the proposed development will be integrated with the existing communities and their supporting facilities and services, from the sub-regional level down to the neighbourhood and block level; dependant upon the location of the site and the intended scale and nature of the proposed development. The residents and workers of, and visitors to, the new development must have ready and convenient access to existing facilities and services; with any new facilities and services, provided as part of the development supporting and integrating with those already existing. Provision for the community must go beyond a consideration of the provision of housing and facilities and must address how the whole and its component parts are designed to promote the integration of a healthy community, who will live, work and play there for at least one hundred years. This will require the integration of new developments into the existing social structure, movement patterns and public transport services and the wider landscape and/or townscape as appropriate.

6.4 Society and its requirements are constantly changing, therefore, development proposals should be designed in a manner that will allow future adaptation and alteration, to prevent developments becoming potentially unused or undesirable if they cannot accommodate future needs. The known changes that are likely to be encountered are, in household size and composition, lifestyle, work patterns and transportation patterns.

6.5 The purpose for developers of properly understanding context is to enable them to promote development, which will integrate with its surroundings. Development proposals that are an imposition on a location and do not address the social, economic, transport and ecological structure of the context will not be accepted.

QUALITY

6.6 Quality is not a matter of luxury, i.e. of expensive design details and construction materials. Quality is concerned with the whole approach to the planning and design of new developments, not just by the developer and the Local Planning Authority, but by all the partners involved, to ensure that new developments conveniently and efficiently provide the facilities, services and conditions the people living and working, or visiting, there require.

6.7 "Bad planning and design and careless maintenance encourages crime, contributes to poor health, undermines community cohesion, deters investment, spoils the environment and, over the long term, incurs significant costs." (p6)
"The places where people live have a profound effect on their quality of life and life chances. Places exercise this effect in a range of ways – through, for instance, crime levels, pollution levels, employment opportunities, social ties and opportunities for community engagement, and the range and quality of local services, transport links and green space. Quality of place can then be understood as that subset of factors that affect people's quality of life and life chances through the way the environment is planned, designed, developed and maintained." (p11) (World Class Places – the Government's strategy for improving quality of place, Department for Communities and Local Government, 2009)

6.8 It is important that new developments are designed and constructed in a manner that minimises the demand on natural resources; by minimising travelling, through the provision of mixed use developments and the provision of good and efficient public transport facilities, footpath and cycle networks; by designing developments that respect the existing landscape and existing biodiversity and enhancing them through the implementation of the proposals; by designing developments to avoid putting development at risk from flooding and ensuring the discharge of surface and rain water is by means of sustainable drainage systems to prevent creating flood risk for others; by constructing with robust materials, to ensure the long term durability of the development; by designing buildings in a manner that readily allows for their future conversion or adaptation; designing and constructing buildings in a manner that minimises their energy consumption for heating, cooling and lighting; by designing developments that minimise the demand for potable water; by designing development that do not result

in air, noise and light pollution; and designing developments that are not only valid today but remain so, in the face of changing climatic conditions, for at least 60 years for commercial buildings and 100 years for all other buildings.

6.9 Achieving high quality development requires the co-operation of all partners involved in the planning, design and ongoing maintenance of new development. This requires all parties to adopt a flexible approach in securing their interests to ensure that the development, as built, is fully integrated without the requirements of any one partner impeding or inhibiting the requirements of other partners, which can result in a reduction in the quality of the services and facilities provided for residents, workers and visitors. With such an approach high quality development should remain the goal and be achievable irrespective of the fluctuations of the economic cycle.

6.10 Quality is dependent upon design rigour, the quality and durability of the materials selected and the quality of the workmanship during construction.

6.11 The following is a list of considerations that impact on design quality and should be considered in the design process:

- Develop a clear design concept.
- Set a realistic budget for design, implementation and management of the works.
- Select design components and apply the principles of design theory composition in a manner appropriate to the concept.
- select materials that are long lasting, good looking and durable.
- Portray the scheme in clear and comprehensive plans.
- Choose contractors carefully, give them clear instructions and ensure thorough supervision of them on site.
- Devise conveyance and management regimes at an early stage.

DESIGN THEORY

6.12 Good design complements and enhances new development, but poor quality design detracts from the development. Architects, urban designers, landscape architects/designers and engineers should pay careful attention to the application of design theory in their designs, to ensure visually strong design compositions in which all the viewer/user observes/experiences is intentional and not undermined by ill-considered accident.

6.13 Design can be subjective with different people having different preferences of the things they like and dislike. However, a meaningful discussion can be had about designs, free from personal preference, through focusing on design theory, i.e. how the design elements and the principals of composition are used. The following is a guide to how design theory will be

assessed in designs submitted to the Council and how comments on design considerations will be referred back to designers.

DESIGN ELEMENTS

Point

6.14 These are the aspects of a design intended to act as points of emphasis to catch the observers eye and direct vision to a particular place or feature. They may be singular, such as a tower on the corner of a building or a statue in a square, or they may be repeated throughout the design, such as a particular feature window, or a particular species of plant. However, too many points of emphasis cause distraction and visual confusion.

Line

6.15 Line is the joining up of two or more points, to lead the eye. This is often intentional, such as with a stringcourse, or eaves line, or a path linking two spaces. A line may also be implied by the accidental repetition of points of emphasis, such as the use of a particular colour, or feature such as trees, resulting in the observer's eye following a line that was not intended by the designer and thus distracting the eye away from the features intended to act as the primary visual attractions.

Shape

6.16 Shape is a two dimensional area on a surface, such as on the floor or a wall, etc. Such intentionally created physical shapes are referred to as 'positive shapes' e.g. areas of panels or windows in a building wall, a building or boundary wall, fence, hedge, paving, grass, plants, water, etc. However, a shape can be implied by the things that surround it, acting as its boundaries, referred to as 'negative shape', e.g. the wall space between door and window openings. Shapes should be co-ordinated to form a harmonious composition to attain the design intention.

Form or mass

6.17 These are three-dimensional objects, buildings or features in the landscape used divide space or to provide points of visual emphasis e.g. pavilions, buildings, plant groups, well-defined spaces. Such physical objects are referred to as 'positive form or mass'. However a space can be defined by the boundaries that contain it, which is referred to as 'negative form or mass', e.g. a 'public square' is defined by the buildings that edge it.

6.18 Additive forms comprise the composition of a number of building structures joined together to give a balanced whole. They are derived from traditional buildings where the original structure is added to and extended over time. Subtractive forms involve the cutting away of shapes from the original to

leave it truncated or with hollows and, though sometimes they may be architecturally interesting, are not typical of local buildings.

Fig Additive forms

Texture

6.19 Texture is determined by the size and arrangement of the constituent parts of an object and is seen by the pattern they create and intensity of shadows cast. Texture is not an absolute aspect of an object but is relative to the size and shape of the object and the texture of the things around it. The observer's perception of an object is influenced by the texture perceived e.g. coarse, medium or fine.

Tone

6.20 Tone is the observer's perception of how dark or light an object is. Tone is not an absolute aspect of an object but is relative to the tone of the things around it. The observer's perception of an object is influenced by the tone perceived e.g. light, medium or dark.

Colour

6.21 Colour is identified in relation to the positioning of the colour in relation to the colour spectrum and modified by the tone, from white to black, to produce shades. The perception of an object's colour varies according to the colours of other objects it is seen in association with. Some colours make objects appear larger or nearer, whilst other colours make objects appear smaller or further away. Great care therefore needs to be taken in the selection of colours.

PRINCIPLES OF COMPOSITION

Pattern

6.22 This is the use of the design elements, point, line, shape, texture, tone and colour, to create the visual design, to create an integrated whole. Too much use of the same element can become boring, but the use of too much variety can confuse the unity of the design.

Rhythm

6.23 This is the frequency of the repetition of a feature at regular intervals to create an intentional series, at regular intervals, which breaks a design down into sub-sections, e.g. a row of windows, pillars, or trees. Too many of the same repetition can become boring, whilst an inconsistent rhythm can destroy any form of unity.

Repetition

6.24 This is the repetition of a feature to create unity throughout the design, other than a structured rhythmical repetition. Too much use of the same repetition can become boring, whilst an inconsistent rhythm can destroy any form of unity.

Variety

6.25 This is the intentional variation of the design composition to create interest and prevent the design composition becoming monotonous. Too much variety can become distracting to the observer and disrupt the visual composition, whilst too little can result in monotony.

Contrast, emphasis, dominance

6.26 Contrast is used to create variety and emphasis. Too little contrast will result in the design becoming boring. Too much contrast can disrupt the unity of the design, giving to much emphasis to one particular point, or giving too many points of emphasis.

Simplicity

6.27 Simplicity is the counterbalance to the multiple use of the other elements and principles, which ensures their repetition does not become cluttered and disunited.

Unity

6.28 Unity is the combination of the design elements and principles into a united composition.

Harmony

6.29 Harmony is the perceived comfort of the design composition to the observer.

Balance

6.30 Balance is readily identified in a symmetrical design where whatever occours on one side of a centre line is repeated on the other side as a mirror image. Balance can also be provided by offsetting a large feature against a small feature, with the large feature set further away from the centre of a composition.

Scale and proportion

6.31 This is the size of features within the design in relation to each other and in relation to human beings, in terms of people's perception and comfort.

Sequence

6.32 This is how the observer sees and perceives the overall design as they proceed through a series of spaces. This addresses how the design of spaces and places aids people to know where they are in a sequence, i.e. are they making an approach to a place, crossing an actual or perceived threshold to enter a place, or have arrived at a destination place.

CHAPTER 7

LOCATION AND CONTEXT

LANDSCAPE SETTING

7.1 The landform in the Cambridge Sub-Region is not highly pronounced; therefore all variations in landform within development areas should be harnessed and accentuated. Great care must be taken not to obscure landform characteristics with development. Road alignments should follow the pattern found in south Cambridgeshire of being aligned generally parallel to contour lines or at right angles to them. Drainage corridors should adopt the pattern of the landscape character area in which it is located the, Bedfordshire Greensand Ridge, Bedfordshire and Cambridgeshire Claylands, Fenland, East Anglian Chalklands, south Suffolk and North Essex Claylands, see Chapter 3 for details of these character areas. The overall morphology of development should be aligned parallel to the contours to reflect the local generally linear character; with buildings aligned parallel to the contours, not up and down slopes, in order to accentuate slope profiles and prevent their loss beneath staggered or irregular development.

7.2 Any new development must sit comfortably in its landscape, taking account of the topography and natural or man-made features. New development should not intrude upon the skyline, with the exception of specifically agreed features selected as landmarks, in the tradition of church spires or towers. If, for the general development, this is unavoidable, careful consideration must be given to the height and form of buildings, with trees and other planting used to soften the impact on long distance views. In some specific cases there may be an argument in favour of retaining a hard built edge to a development.

7.3 Developers are required to undertake a design-led approach that demonstrates and justifies its appropriateness for the development and its location.

VILLAGES

Character, Significance and Models

7.4 South Cambridgeshire is a particularly rural area. Agriculture was the main employer well into the last century and despite significant growth its population density is currently little more than a third that of the country as a whole.

7.5 The district almost entirely consists of villages (over 100) and countryside, and it is the rural settlements and landscapes, and their relationships, which gives it its special character.

7.6 Historically, each village was supported by an area containing agriculture and other natural resources. The boundaries of many of these areas were set by prehistoric times. Most of our rural settlements existed in some form by Domesday and the pattern of villages was more or less fixed by the fourteenth century. Our settlements and landscapes are a rich mix of survivals from the past, continuity, loss and change.

7.7 The relationship between villages and the surrounding countryside is crucial. For example, routes through and to the countryside often helped shape the forms of settlements. Some villages were laid out over earlier medieval field systems and their origins are reflected in grid plans and the shape and size of fields and tofts. Tofts were generally developed as individual plots with a detached house in each. These medieval boundaries and long fields can be still identified in parts of the Bourn Valley and the fenlands.

7.8 Medieval villages provided shelter and sustenance, but also reflected people's ideas of what a village should look like, including those of the community. Many villages were entirely planned and evidence of the earliest medieval planning still shows in the street patterns and narrow burgage plots of many of the district's villages.

7.9 The historic development of villages and landscape is often complex but it can, with sufficient attention and expertise, be interpreted. Such an understanding is an essential starting point for the design of new development.

7.10 The district's villages give historic models which should influence modern development. For example, these aspects of historic layouts could usefully be repeated:

- Grid plans and structures of roads and lanes and single and double rows.
- Development along interconnected routes (including those leading to the countryside).
- Small fields surrounding and within villages (usually early enclosures) which screen buildings and give good settings and other benefits.

7.11 Villages and landscapes are therefore important and interesting because of their long and complex histories and relationships. They are valuable culturally as well as physically and visually, and the survival of villages shows that they have been a successful and flexible type of settlement.

Villages need to be understood to inform the design process. Finally, their historic development provides useful models for future development.

7.12 Villages need to be given the attention and importance they deserve. This will help generate imaginative designs which come out of individual places and avoid standard village pastiches.

Challenges for Modern Development

7.13 Development of any site must be understood and planned in terms of the history and future of the entire village. Developing individual sites in a piecemeal way is likely to detract from the village as a whole and its sense of place. The widespread use of cul-de-sacs encouraged by such an approach conflicts with historic structures and character and urban design principles.

7.14 Many villages include areas of countryside and open spaces. The more built-up parts generally had low densities, for example, a row of detached historic houses could have a density of ten dwellings per hectare. Making successful responses to the historic patterns and densities of villages, which are important parts of their character, is a key challenge.

7.15 The context of any new design will be informed by the established character of the area. This will include views, roads and paths, trees and landscapes and the scale, proportions, orientation, positions, building lines, styles, proportions and materials of existing buildings.

7.16 The uniformity of much modern development – such as much criticized 'anywhere housing' – often contrasts with local character. Some accommodation for home and shared work use, and for local services, could increase the variety of building types.

7.17 Responding to existing variety in building design is a key challenge for new development as is the need to reflect the distinctive character and identity of each village.

7.18 Proposals should identify the focus of the context, whether countryside or settlement. Within the countryside it may be the long views and clumps of trees, and within the village it may be more intimate views or glimpses of countryside, and of the church, generally the focus of the settlement. The character of each part of the settlement or context is distinctive and careful consideration should be taken to preserve or enhance it.

7.19 The layout of each settlement also defines the positions, forms and footprints of new urban structure. The development within a nucleated settlement is contained within a roughly rounded perimeter, and in rolling landscapes such as the west, south and east of the district the settlement is

often located on higher or lower ground than the land around it. In nucleated settlements new development is often limited to small or infill sites as it would risk being in competition with the original settlement if it extended significantly from one edge of the original group or overflowed onto the next ridgeline. A linear settlement follows the line of a road and does not extend significantly beyond the roadside buildings. Small lanes may extend outwards but they are characteristically short, often leading to a church, manor house group, farmstead or small farm cottages. New development therefore is generally restricted to the road edge.

7.20 Village frameworks are outlined on the Proposals Map, and certain villages have their own Village Design Statements. The Local Development Framework also outlines Conservation Areas, and these are described in full detail in Conservation Area Appraisals. These Appraisals also contain summaries of Listed Buildings and Listed Buildings. The Council keeps a register of Listed Buildings and lists and descriptions are available at English Heritage's Images of England website (www.imagesofengland.org.uk). The grade of listing defines the special attributes of the building and setting, and a full analysis of the special characteristics of the Listed Building and its setting will inform the extent and type of new development possible.

7.21 Villages need to respond to the implications of climate change and scarce resources by reducing vulnerability and increasing the opportunities for sustainable action. Traditionally houses in the countryside had plots that allowed people to grow fruit and vegetables, and large gardens should be encouraged. (Many modern developments have small gardens.) Local food production, community orchards and community farms should also be supported. Existing and new small fields next to settlements provide opportunities for these along with accessible wildlife and other beneficial uses.

7.22 The movement of people living in villages can be severely restricted by the lack of safe, and suitably surfaced and connected, routes within and between settlements, and into and across the countryside. New development should allow and support these rather than act as barriers.

7.23 It is a challenge to combine some sustainable forms of construction and other approaches with local character, but this could provide a spur to imaginative design.

7.24 Each village has a defined village framework shown on the LDF Proposals Map, outside of which there is a presumption against development. Certain villages have also prepared their own Village Design Statements and, where available, these should always be consulted.

7.25 New development in villages should reflect the development's location in the spatial, historical and physical hierarchy of villages, i.e. Rural Centres, Minor Rural Centres, Group Villages and Infill Villages. Such an approach will ensure the development's design addresses its context in a strong and imaginative way and, in so doing prevent the presentation of a standard village pastiche that relates to no village in particular.

URBAN EXTENSIONS

7.26 Urban extensions are the addition to the outer edge of an existing settlement, of a new neighbourhood, district or township. All major urban extensions identified are for extensions to Cambridge.

7.27 Urban extensions will be of sufficient size to be able to establish their own identity and character and provide a focus for the group. They should, however, relate to the existing urban areas with which they share a common boundary. It is also essential that urban extensions present to the surrounding countryside an urban edge that is sympathetic to the character of Cambridge, or any other settlement extensions are proposed for.

7.28 Urban extensions will often be of sufficient scale to enable the incorporation, from the outset, of high levels of sustainable technology to minimise the environmental impact of the development.

7.29 Such considerations should include local heat and power generation, sustainable drainage systems, direct and convenient footpath and cycle routes to access the settlements primary facilities, direct and frequent public transport routes to access other facilities.

NEW SETTLEMENTS

7.30 The focus of new development is on brownfield sites within existing urban areas; however in the Cambridge Sub-Region it is recognised that there is a need for a new settlement to provide the number of new homes required, without damaging the character and integrity of Cambridge, its surrounding settlements and their rural and green belt setting. New settlements require careful integration into the community structure of the Cambridge Sub-Region and should not undermine or compete with the existing settlements and their facilities, but rather be complementary to them to support both the existing and proposed population. They should form settlements that are connected to Cambridge and other local settlements via efficient public transport links.

7.31 South Cambridgeshire is a rural area with Cambridge being the only large urban area and the other settlements being mainly villages or small towns. New settlements should harness the characteristics of the setting and form of the existing settlements in the sub-regional landscape, see Chapter 3 for

information on the varied local characteristics. Innovative design solutions are encouraged, whilst pastiche design solutions are discouraged.

7.32 New settlements should be designed from the outset to incorporate high levels of sustainable technology to minimise the environmental impact of the development.

7.33 Such considerations should include local heat and power generation, sustainable drainage systems, direct and convenient footpath and cycle routes to access the settlement's primary facilities, direct and frequent public transport routes to access other facilities, both within and outside the new settlement. Further detail is contained in the Sustainability section.

INFILL DEVELOPMENT

7.34 Infill plots are small-scale plots within existing developed areas and will always have a significant impact on the character of the established streetscape and on neighbouring properties, therefore good design is essential to ensure a positive impact is achieved. By definition infill sites are additions to the established development pattern; consequently they will be expected to complement the street pattern by continuity of form and design, or by an appropriate contemporary contrast. They will be expected to make best use of the site while enhancing the rhythm of the established street pattern.

7.35 A detailed analysis of the adjacent built environment should form the foundation of any design, in order to understand how the proposal will relate to its surroundings. Considerations include: the distance of building fronts from the pavement edge; heights, positions and types of boundary treatment; storey-heights of buildings compared to their widths; depths and character of surrounding gardens; and typical building types: whether detached, semi-detached, terraced or courtyard developments.

MIXED USE

7.36 Traditionally many villages and towns in the Cambridge Sub-Region developed at the intersection of roads, or close to bridging points. Service facilities usually became established at or close to the intersections, with incremental growth spreading out from the historic core along the roads, with infill development following between the roads in the larger villages and towns.

7.37 Mixed-use areas maintain more even levels of activity throughout the day, preventing residential areas becoming inactive during the working day and preventing employment areas becoming inactive outside the working day.

7.38 The benefits of mixed-use development include:

- More socially diverse communities.
- Greater safety arising from more people being around at most times of the day.
- Increased vitality and street life.
- Potential for increased viability of urban facilities, arising from increased support for small businesses such as corner shops.
- More convenient access to facilities.
- Greater opportunities for social interaction.
- Increased stimulation arising from an increase of different buildings within close proximity.
- Some travel to work journeys are reduced, reducing traffic movements and congestion.

7.39 A successful and sustainable local neighbourhood is a product of:

- The distances people have to walk to access daily facilities.
- The presence of a sufficient range of such facilities to support their needs.
- Places and spaces where a variety of activities can take place.

PROVIDING MIXED-USE CENTRES

7.40 Mixed-use centres are not self sufficient therefore they need to be part of an integrated larger urban structure that has the population to support the facilities and services provided. They are best located therefore at the intersection of the main movement routes through both the neighbourhood and the larger urban structure. The mixed-use centre is the core of a neighbourhood within which the local shops, commercial uses and amenities will be located. The bare minimum to create a community focus is a shop, bus stop and primary school. Other facilities that could be located there are nurseries, libraries, community centres, police stations, other business premises, other retail premises.

7.41 A diversity of uses can result in conflict if they are incompatible. This is not an argument for avoiding the provision of mixed use, it merely requires careful consideration as to what is an acceptable mix of uses in both the development and its neighbours; supported by strong site planning to separate any potentially conflicting uses.

7.42 Opportunities should be taken to incorporate in the main urban areas, uses such as office and retail premises and industrial units that have become located in out-of-town locations. As such uses often have large building footprints out of scale with residential properties, they should not be located

in the urban fabric as islands, but rather surrounded by other smaller development to help integrate the larger unit into the locality.

7.43 The location of such premises in urban areas should not result in unacceptable traffic levels from people accessing and leaving the facility, should not create other unacceptable nuisance for residents, nor should it undermine the primary town and village centres. Travel Plans and Transport Assessments will be required to justify the development proposals.

LARGE BUSINESS PREMISES

7.44 New buildings in business parks and on industrial sites are often large structures that can make use of 'state of the art' construction methods and materials. As a result they can have a significant visual impact on their locality and may be visible over a considerable distance, if sited in a prominent, isolated or exposed location.

7.45 Large buildings should be sited to avoid their mass breaking the skyline. Where this is unavoidable their design should mitigate the problem, possibly by breaking the building down into articulated blocks and through the use of landscaping as a screen and to break up the silhouette.

7.46 The blank 'boxes' of large industrial and storage buildings are particularly difficult to successfully integrate into the streetscape. 'Big-box' uses should be mixed horizontally or vertically with other uses to remove or minimise the blank inactive frontages they present to their neighbours. As many of the active uses as possible that will take place in the building e.g. cafes, offices, etc, should be located at the outer edges of the building to create active frontages. Smaller units can be constructed along the faces of the building.

7.47 Travel Plans will be required to minimise car parking provision. Other uses can be constructed above the main building. Car parking, subject to the context of the location of a building, could be provided in a basement or on the roof to remove the expanse of car parking, associated with such buildings, that creates a void in the urban fabric and divorces the units from their neighbours. Other methods to mitigate the impact of large structures include articulation (employing L or T shaped plan forms); multi-span roof forms to reduce overall height of deep plan structures; and the graded massing of buildings, whereby smaller buildings are sited in front of larger structures. Avoid roof-mounted plant that exacerbates the visual appearance of large structures. Design buildings to incorporate such plant requirements within the building structure.

7.48 A good example of a local business park is at Kings Road, Hardwick, where barns have been converted for business use.

MATERIALS FOR BUSINESS PREMISES

7.49 The choice of materials and their colours can have a significant affect on the overall impact of a large new structure. When making the selection consideration must be given to how the materials will perform over time; bright colours frequently fade, while 'fashionable' detailing may quickly appear dated and shiny or reflective materials can attract undue attention to a structure, whereas natural materials (such as brick and stained timber) have been proven to 'grow old gracefully' and are particularly suited for sensitive locations.

7.50 A more contemporary approach may be appropriate utilizing high quality, modern materials, whilst ensuring that the building complements the character of the surrounding development or its landscaped setting.

HOUSING TYPES AND MIX

7.51 All large residential areas should include a mix of sizes, types and tenures of property, within neighbourhoods, to cater for all stages in the life of households, 'Lifetime Homes', from single young people through to residential care facilities, so that whatever their needs, residential opportunities exist for people without having to leave the neighbourhood, if they so wish. Residential development will provide a range of types, sizes and affordability, including Affordable Housing, to meet the identified local needs.

DISTRICTS / NEIGHBOURHOODS / COMMUNITIES

7.52 Successful communities require a range of local services and facilities, including retail, educational, health, civic and spiritual. These need to be conveniently located and accessible by safe and comfortable routes.

7.53 From the mid twentieth Century different uses in development became segregated. This segregation of uses reduces the overall activity in areas restricting the periods of activity, making them less attractive locations for the establishment of supporting services.

7.54 Local facilities bring residents together, reinforce community and discourage car use, as well as helping to reduce the need to travel by car. Including mixed-use in larger housing developments can help to foster a more vibrant and cohesive community. It also introduces a variety of building scales and forms, creating diversity and interest in the streetscape. Therefore, the needs for non-residential uses should be identified at the outset and incorporated into the masterplan, with sites reserved for future provision where necessary.

7.55 Mixing tenures promotes social diversity; it is important therefore to spread different building types and tenures throughout a neighbourhood, rather than group them into single areas, which divisively subdivides the neighbourhood, rather than supporting the integration of the neighbourhoods differing components. Accordingly mixed-use areas are preferable locations for the establishment of supporting services and facilities.

7.56 Higher density developments are better located close to the local centres to maximise the numbers of people able to support those facilities within the 400 and 800 metre walking distances. The scale and density of a potential neighbourhood centre is dependant upon where the development is located within the urban hierarch.

Fig. ?. An example of vertical and horizontal mixed-use, Kings Parade, Cambridge.

7.57 Local facilities provide a natural focus to towns, districts and neighbourhoods, drawing people together at informal meeting places. Facilities should be provided at convenient locations and distances from homes. Convenient local facilities are within an average 5 minute walking time, which equates to a 400m walking distance. Developments should be designed so that all residential properties are within 400m of a bus stop to encourage people to use public transport in preference to private cars. Local shops, a primary school and a doctor's surgery should ideally be located within an average walking time of 10 minutes, which equates to a 800m walking distance. If such facilities are provided further away than 800m from residential properties residents will be discouraged from walking and be more inclined to use private cars to access those facilities. Once people have opted to use a car to access facilities, they may not automatically use the local facilities, therefore to support sustainable communities facilities should be provided within 800m to ensure they are easily accessible and supported by the local community.

Fig. ? The components of a sustainable 'walkable' neighbourhood. Source Adapted from Urban Task Force 1999

Fig. ?
Actual 5 and 10 minute walking catchments compared to theoretical ones at Trumpington, Cambridge.

Fig. ? Initially it may appear appropriate to locate a mixed use development in the centre of the neighbourhood, left; but it may be advisable to locate it a more visible 'nodal point' at the intersection of the larger 800m grid, to attract more users, centre and right.

CHAPTER 8

THE ELEMENTS OF URBAN FORM

CREATING A SENSE OF PLACE

8.1 Everywhere is somewhere, irrespective of it having a strong, a weak, a unique, or a pattern-book identity, irrespective of it having desirable or undesirable associations. The starting point for development proposals should be what is "the spirit of the place" (the genius loci), what is good, strong and desirable to harness and what is poor, weak and undesirable that presents the opportunity for change and improvement. In relation to new development the aim should be to create somewhere that is recognisably distinct, whilst simultaneously strengthening the larger local identity.

8.2 The development must create an effective network of streets and buildings that achieve a permeable network and encourage cycling and walking. A permeable network is one that is easy to navigate and easily accessible by means of interconnected routes. It will not contain cul-de-sacs or no through routes as these result in poor integration and tortuous routes between places. A key structuring principle should be the movement pattern on foot, bicycle or public transport.

8.3 Any new development designed as one and constructed in a short period of time, compared to the lifetime of the settlement, runs the risk of appearing uniform. The design of large new developments should be undertaken in a manner that reflects the incremental growth of the settlement the development, lies within, is attached to, or is nearby, in the case of a new settlement. House sizes and tenures create a more effective community character when they are intermixed throughout the development.

8.4 Any new large-scale development should be designed around a pattern of connected streets and public spaces that can be easily understood, so that people know where they are. The street network should focus on busy pedestrian places which have an identifiable and accessible heart, the location of which is marked by a concentration of facilities (e.g. shops, offices, small-scale workspaces, civic functions, schools, clinic, a public square or park) and by an increasing building height, providing greater enclosure. The heart of the development, and other important spaces, should also include features and landmarks that define them as special places.

8.5 Local facilities to efficiently support the new communities should be within easy walking distances and the routes to these should be of high quality for both pedestrians and cyclists. The walking distances to facilities are the keystone of any movement framework. The Urban Task Force

recommends that residents should have to walk no more than 2 to 3 minutes to a post box, or local open green space; 5 minutes to the newsagents and there should be local shops, a health centre and a primary school within 800 metres, or about 10 minutes walk. This is based on an environment that does not present obstacles to walking, such as busy roads.

URBAN STRUCTURE

8.6 The urban structure is formed by the interrelationship between the components of urban areas, the blocks of development and buildings, the streets and open spaces. The urban structure creates an integrated framework that forms the foundation for any new development within it. The urban structure of new developments should ensure that the components work together to form an efficient and integrated whole.

8.7 The urban structure should seek to maximize opportunities for vistas towards landmarks, open spaces and distinctive buildings. Building form, materials and details are informed by the immediate and wider surroundings (see Chapter 3) and in general, natural colours are used that relate to the landscape and traditional materials of the locality. However, cues should not be taken from poor quality examples.

8.8 Many South Cambridgeshire villages present important frontages to the surrounding landscape, contain Conservation Areas or an historic street framework and contain or frame numerous strategic views (both within the settlement and out to the landscape). This contextural development should be used as the basis for analysis to determine the character of new urban structure appropriate for the area.

Table 1: Getting the layout right

Achieve this:	By doing this:	Examples/Notes
A choice of interesting routes	•Create routes to link up broken routes on either side of the site. •Align routes along desire lines to provide direct links to schools, shops and other destinations. •Base movement on a loose grid, with new routes every 50-120m. •Avoid culs-de-sac.	

Well defined street-spaces	•Join buildings to create well defined frontages. •Use smooth building alignments for continuity. •Use building fronts to define the street-edge. •Turn corners with buildings to prevent blank elevations presented to streets. •Incorporate focal spaces for human interaction at key nodes.	Unless set-backs are characteristic
Clearly defined public and private space.	•Use perimeter blocks with public fronts and private backs. •Incorporate flexible communal or private garden space in the core of blocks. •Avoid spaces where ownership and the opportunity to use it is unclear.	Give all space a purpose
Lively and safe street space	•Place building entrances on the front of buildings to ensure ground level interaction between buildings and the street. Individual entrances provide more activity than communal stairs. •Incorporate non-residential uses in the ground floor at key nodes for activity. •Ensure public spaces are overlooked by buildings.	

8.9 The following table identifies a categorisation of urban sites, based on shared physical characteristics and/or common issues. This results in shared urban design issues and the potential for similar urban design solutions.

Table 2: Layout guidance for different types of site

Type of site	Specific layout considerations
Infill to road frontage	•Building alignments to define the road frontage are important. •Complete perimeter blocks. •Building scale, form and alignment should be determined primarily by the immediate townscape context.
Sites with more than one frontage	•Turn the corner with a double fronted building. •Where the junction is a node can justify an increase in scale over immediate surroundings to emphasise the node. •Trading amenity and parking standards against townscape benefits can achieve a perimeter block fronting more than one space.
Edge of open space	•The extent to which the size and type of space being addressed justifies an increase in building scale. •Using a good outlook and useable balconies to justify a reduction in garden sizes, subject to not losing privacy for properties.
Backland with no frontage	•Whether the proposal would fit with the grain and spatial character of the area. •Whether the site is big enough to enable a new inward looking enclosed courtyard space to be formed (typical minimum site dimensions 30m x 35m). •Ensuring the new space has a satisfactory relationship with an existing place e.g. a vista stop within 65m of a main street, or a maximum access length between side walls of 40m – measured from highway boundary to the first new frontage. •Whether the access can be designed to appear as an approach to a new area; ensure at least one of the units at the front incorporates an active frontage to the new access way wherever possible. •Whether satisfactory access can be formed from a functional point of view; 2.4m min for shared drive off a lower category road, this may need to be wider

	to attain the desired visual impression; 3.7m minimum where fire appliance access is required; 4.1m minimum access width where access taken of higher category road. •Securing quality of life for new and existing residents (see privacy/garden size criteria).
Limited road frontage and space in depth	•Carefully address the corner turnings at the access. •Is the site is big enough to enable frontage and in-depth development (typical minimum dimensions for frontage development plus courtyard is 30m width x 50m depth)? •Securing a good quality of life for new and existing residents.
Public road and space network required	•Get the interface between the new and existing development right. •Create routes that take people where they want to go. •Front buildings onto routes and spaces to provide natural surveillance. •Create workable blocks between active roads or routes that enable permeability; the spacing between roads can be as low as 60m in areas of high movement, near town and local centres; a spacing between roads of 80m and 100m is ideal for most circumstances; and a spacing between routes of up to 120m can be appropriate in areas of low movement; generally the spacing between roads should not exceed 120m as this is a barrier to permeability. •Create areas of strong character.

8.10 These typologies cover the majority of typical development sites but are not necessarily exhaustive. Sites that are unique or special will always warrant careful appreciation of context, assessment of potential and an appropriately responsive design solution.

EDGES

8.11 Places are often defined by linear objects e.g. rivers, railways, busy roads, etc. that often form physical barriers to movement and therefore define the edges of places. Less obvious are psychological barriers that can be

physically crossed but which people may prefer not to cross e.g. open spaces which no one overlooks, major roads, areas of different tenure of housing or use, etc. New developments adjacent to such features must be carefully considered so that they do not create a barrier to movement within the development. Sometimes it may help strengthen identity to retain such edges, whilst on other occasions it may create new opportunities to create new identities or break down actual or perceptual barriers to create routes that cross these barriers.

8.12 The edges of new development should blend into the landscape by means of lower density towards the perimeter, with increased planting predominately of native species. The use of close-boarded fencing along development edges is not appropriate within a rural context and is generally local hedging or post and rail.

ROUTES

8.13 A key to successful development is good access and connections between the site and its surroundings, whatever the size of the development and, the opportunities presented by the context should be harnessed. The structuring of routes in the new development should effectively address the following issues: How will the routes from the new development integrate with those existing in the surroundings? What are the existing movement routes around and possibly across the site? Who is moving from where to where and when? How will this influence the movement into, out of and around the site?

8.14 Movement affects uses, activities, density, security and the impact on neighbouring developments. A successful movement framework, takes full account of the movement requirements the development will generate, provides maximum choice for how people will make their journeys and makes clear connections between the new and existing routes and facilities. The movement framework should make it as easy and attractive to walk, cycle or take a bus, as it is to travel by car. Direct attractive routes should be established to connect residential areas with facilities, maximising the number of properties, especially residential properties, that can access bus stops within a 400m walk and a local centre within a 800m walk. The maximum number of direct connections to the main streets should be provided. The greater the number of links to the main access roads, round or through developments, the greater choice people have as to which route to take and the greater are the opportunities for successfully establishing mixed use developments and, the greater is the discouragement of crime and antisocial behaviour as the greater the uncertainty for perpetrators that they may be disturbed. These aspects of the design rationale should be clarified in the developer's Design and Access Statement.

8.15 Linear spaces facilitate movement, which may be formal or informal in character. The movement network includes all the routes and all types of travel, and should allow easy access. The cycle and pedestrian routes will require a finer grid than those for cars and public transport. Lower order roads should be used wherever possible, while tortuous routes and culs-de-sac should be avoided. The development should also take into account the type of movement it will generate and promote movement on foot, cycle or public transport.

8.16 The better connected a development is, the stronger is the case for a higher density of development and a lower car parking provision. However, the provision of good public transport connections may only result in the reduced usage of private cars rather than in reduced car ownership and provision is always required for visitor car parking spaces.

8.17 A hierarchy of routes should be established to aid legibility for those moving through an area, so it is clear if people are on a main route through an area, a secondary route providing access into development areas, or are within development areas on tertiary routes.

8.18 All routes should have buildings facing onto them to provide natural surveillance of the routes to deter crime and antisocial behaviour. At the same time buildings and how they address the routes should be designed to provide privacy for residential properties and any others requiring privacy such a health centres.

8.19 Public realm spaces should be well contained by the buildings that edge them. The fewer breaks there are in the built frontage and the narrower any breaks are the stronger will be the containment of those spaces.

8.20 Routes should not be the divide between development parcels. Routes should run through development parcels to ensure continuity of development for those travelling along the route.

8.21 The management of pedestrian, cycle and vehicle movement, together with vehicular parking should be integrated into the design of the routes, streets and public spaces, and not dealt with as an afterthought through the use of painted lines and bollards.

Fig. ? A ‘homezone’ that has been retrofitted to an existing development, Groningen, Holland.

GRIDS AND BLOCKS

8.22 Grids are a widely used way to achieve convenient connections through developments. Such grids can be of rigid geometry or may be less rigid and more fluid. Route spacing in a grid of 80 to 100 metres provides an optimum network for pedestrian, cycle and vehicular movement, although it may not be necessary for all routes to be open to vehicular traffic. In town centres route spacing in grids for pedestrians and cyclists can be reduced to 65 metres where high volumes of pedestrian activity will be experienced. Conversely in suburban locations where pedestrian and cycle movement levels will be lower route spacing on grids can increase to 120 metres; spacings greater than this can impede permeability and discourage pedestrians and cyclists. Neighbourhood centres will not all have all facilities present, therefore a network of mutually supportive neighbourhood centres that share certain facilities should be established. To allow neighbourhood centres to be mutually supportive and easily accessible for pedestrians, cyclists, buses and motorcars, a larger grid at 800 metre centres should be established to link the neighbourhood centres.

8.23 Many historic settlements comprise an informal, grid of interconnected roads, streets alleyways and space. This is in marked contrast to the visually and socially less successful twentieth Century 'tree hierarchy' type layouts that contain culs-de-sac, dead ends and unnecessarily tenuous through routes.

Fig. ? A well connected grid, right, strongly integrates a development with its surroundings, whereas a cul-de-sac structure, left, fails to do so. (source Llewelyn-Davies 2000)

8.24 It is desirable to create an informal, permeable grid for new developments that connects into the existing street pattern. The layout of grids and blocks should be determined by the grain and visual character of the surrounding area, and the atmosphere that is sought for the new development, coupled with the need to control the degree of permeability (to ensure adequate security), which will focus through routes on 'desire lines' and destinations. The specific location within the South Cambridgeshire District will also affect the type of layout appropriate to a new development (see Chapter 3 on Village Landscape and Settlement Character).

8.25 The orientation of blocks within the grid should, where possible, be arranged to enable the principal living rooms in the dwellings to face south and thereby maximise passive solar gain.

8.26 Perimeter blocks that are secure in their core should be provided.

8.27 The collection of buildings within a block should create a varied and interesting skyline; and a collection of blocks should create an interesting wider skyline. Developments should not be designed in isolation without due regard to their collective appearance, particularly as a skyline. Within the design of individual houses, chimneys are important elements of the skyline and help to provide an appropriate scale and articulation of the building and group.

DENSITY

8.28 High-density residential development is often misconstrued as being synonymous with poor quality and high-rise urban housing. In comparison medium rise high-density buildings of 3 – 4 storeys maximises density whilst minimising perceived intensity or overcrowding. Density is a product of the design and should not be used as a determining factor in the design approach adopted. Therefore, a design led approach to residential areas should be adopted, that is appropriate to the site, its location and its context.

8.29 Higher density residential developments can locate greater numbers of people within the 400 and 800 metre walking distances of local centres improving the viability of the services located there.

8.30 Higher density developments can provide economies of scale in relation to the provision of infrastructure, making such things as undercroft or basement car parking more viable.

8.31 Higher density developments can make public transport services more viable. The Local Government Management Board's rule of thumb that densities of 100 persons per hectare are often regarded as necessary to sustain a good bus service. Within a walking distance of 800 metres, generating a walkable neighbourhood covering an area of 97.5 hectares, equates to 45 dwellings per hectare, assuming an average household size of 2.2 persons.

8.32 Policy HG/1 in the Development Control Policies DPD seeks average net densities of at least 30 dwellings per hectare, except in exceptional justified circumstances; and net densities of at least 40 dwellings per hectare in more sustainable locations close to a good range of existing or potential services and facilities, or the potential for good public transport services.

8.33 To assist in placemaking the density of development should be varied and not uniform in order to create variety of built forms. The higher density development should be provided at or close to the heart of the development, with density decreasing with distance from the heart.

8.34 Special circumstances may exist within a Conservation Area, within widely spaced buildings, or on the rural edge of a settlement. However, this is considered on a case by case basis.

PLOTS

8.35 A settlement may contain numerous different sizes and shapes of plot, but usually an overall pattern can be identified and, when subdividing larger plots, this pattern and scale should be respected, as it adds to the unique character of a cumulative settlement. The pattern will need to be varied to suit the individual location, be it along a straight street, a curving street or at a corner junction. The proportion of width to depth of a plot often distinguishes the density and character of the built environment.

8.36 All plots should promote a human scale with a frontage to the street that reflects the local characteristics. Larger buildings may sometimes be disguised using a smaller building in front to suggest a more human scale where viewed from the public realm.

8.37 Corner plots present special challenges, as the building must relate to more than one frontage. Building position, garden layout and boundary walls can all define their success in the structure of the built environment. Attention should be paid to the layout and orientation of similar corner plots in the same settlement. Access into the plot and the locations of openings within the defining boundary should be carefully considered in relation to the adjacent plots and those on the opposite side of the street.

8.38 Neighbourliness will be an important consideration; therefore privacy and the avoidance of overlooking, particularly from window to window, but also from window to private garden space, should be given high priority in any residential context, as should any effect on daylighting and a sense of ‘overbearing’ of adjacent properties.

8.39 Developers should always generate innovative design solutions that exhibit architectural excellence. However, where a site is in a landmark location within a settlement, or may be difficult to develop, such innovation and excellence are essential.

ARCHITECTURE

8.40 The detailed design needs to acknowledge the materials and vernacular traditions of the region (outlined in Chapter 3), but without resorting to pastiche. There are examples of contemporary design that have successfully achieved this, while others have been equally successful in adopting a more traditional design approach. Both approaches require a rigorous and consistent design ethos, coupled with a careful attention to detail.

BUILDINGS AND STREETSCAPE

8.41 The relationship of surrounding buildings to the street and the placement of buildings within their plots create a precedent that should be considered when designing new developments.

8.42 Within a settlement it is usually the buildings that define the boundaries of the public realm (street or open space) and, typically, the front wall of a building and the ridge to the roof are placed parallel to the street. This relationship should be followed on new developments, although deviations may be appropriate in special circumstances.

Fig. ? Two infill buildings, High Street, Cottenham. Semi-detached houses follow the street pattern, and use similar opening proportions.

8.43 The size, shape and orientation of buildings in the streetscape will define the 'weave' of the built fabric. For example, detached buildings, which are placed in the centre of larger width plots, define a looser-knit settlement pattern than lines of terraced houses. Also, buildings that directly front on to the pavement generally define a narrower street than buildings set back with front gardens and garden walls.

Fig. ? Infill house, High Street, Cottenham. The new house is set back from the street front, with the gable facing the street, forming an informal hard surface off the street. The arrangement creates interest in the village setting, with materials and proportions reflecting adjacent buildings.

8.44 Buildings should be grouped together to create unity, whilst providing variety and interest in the streetscene.

8.45 The street frontage typically forms a public face, behind which lie the more private interiors and gardens. It is the public face that people directly relate to on a day-to-day basis, but it is the density and depth of accommodation away from the street that defines the life on the street itself. New sites affect both of these aspects and the impact on the public realm should be considered as part of the design process.

8.46 The height and massing of buildings is traditionally greater towards the centre of towns and neighbourhoods. Reinforcing this trend will mean that most efficient use is made of land that is particularly central or well connected relative to local facilities etc.

8.47 Building depths should respect the local character. Uncharacteristically large building footprints should not be located in sensitive areas. Domestically scaled traditional buildings have spans of no more than 5 – 6 metres.

8.48 In order to achieve a degree of visual cohesion developments should incorporate the following general principles:

- Building lines should normally run parallel to the back of the pavement, not at an oblique angle to it.
- In more urban situations buildings should front onto streets and other public spaces, creating perimeter blocks.
- Buildings should be grouped together to create positive public spaces; these may be streets, squares, crescents or courts.
- Buildings should be properly linked or properly detached; narrow gaps between them create a cramped appearance.
- Specially designed buildings should be used to turn corners so that a building face is presented to both street elevations.
- Blank facades facing public areas should be avoided.
- Buildings should reinforce the local character whilst creating distinctiveness.
- A richness of detailing, both design and materials should be provided.
- When access to parking at the side of properties or in rear parking courts is required, suitably proportioned archways or other openings should be used to maintain the building line (where appropriate), rather than leaving gaps in the street frontage.
- Well-designed front boundaries can provide continuity within the streetscape but generally façade lines create a stronger definition.
- To ensure that developments have a unified 'feel', particularly where several developers are involved, the Council will require the prior agreement of a set palette of materials and details. This will ensure an element of co-ordination between developers, their standard house types and finishes, so that unconsidered changes in form and materials are avoided.

8.49 Consideration of larger scale buildings in less sensitive areas outside the closely built settlement centres should include efficiency of the building in use. A depth of 5-7 metres provides the most flexible form and where buildings are less than 13m deep, they can be lit and ventilated naturally.

DAYLIGHT AND SUNLIGHT

8.50 Daylight and sunlight are primary considerations in any proposal, both for the new accommodation, and for that of the neighbouring development and gardens. This depends on orientation and the built form, but buildings must not significantly overshadow a neighbouring property's windows or garden, or block their views, and evidence will need to be shown that this is the

case. Buildings will not normally be allowed to protrude beyond a 45-degree line drawn horizontally from the nearest window of a neighbouring property.

Fig. ? Diagram of 45-degree "rule of thumb" concerning daylighting. The dot/dash line indicates the 45 degree line drawn sideways from the centre of the nearest adjacent window. This also applies upwards from the top of a window.

PRIVACY AND OVERLOOKING

8.51 Privacy and avoiding overlooking of neighbouring houses should be given high priority in any residential context and the Council is required to consider any relevant objections received from neighbours.

8.52 To prevent the overlooking of habitable rooms to the rear of residential properties and rear private gardens, a minimum distance of 20m should be provided between rear and side building faces containing habitable rooms. Where blank walls are proposed, this distance can be reduced to a minimum of 12m between the wall and any neighbouring windows that are directly opposite. It is preferable that a minimum distance of 15m is provided between the windows and the property boundary

Fig. ? Diagram of 12m and 18m "rules of thumb" concerning daylighting and over-looking. The plan shows two residences with back-to-back gardens. The 18m rule of thumb refers to primary habitable rooms that face each other. The 12m rule of thumb refers to a blank wall that faces a neighbouring room.

8.53 Consideration should be given to orienting buildings to the south or within 30 degrees of south to maximising the potential for harnessing solar gain to reduce the demand for space heating and solar power for energy production.

Diagrammatic section illustrating acceptable types of windows in walls parallel to a boundary.
1. Cill of window higher than 1.7m from floor level.
2. View blocked by hedge/wall/fence, etc.
3. Use of obscured glass in fixed window.

8.54 Consideration must also be given to the impact of direct overlooking from a new dwelling into a neighbouring garden, particularly from upper floor windows. Oblique overlooking is fairly typical, but windows built parallel to a boundary wall should ideally be avoided or, if necessary, be of obscured glass and fixed shut (apart from any top vent), or should be at high level in

the internal space. Careful internal planning of rooms will assist. Protective boundary treatments, garden walls and planting, can assist in obscuring views, but as these cannot be relied upon to remain in perpetuity they should not be utilised as the primary means of creating privacy.

COMMUNITY SAFETY

8.55 Good places are safe and secure. Safety and security stem from good site planning and the careful design of buildings and spaces. As well as being inherently safer, such developments will have a sense of public ownership and civic pride. Developments that meet the need of communities and are well managed are safer.

8.56 Developers will need to ensure that crime prevention is considered as an integral part of the initial design of any development and not as an after thought. Development should incorporate the principles of 'Secured by Design'. In particular, they will need to demonstrate how their development proposal has addressed the following issues, in order to design out crime:

- Natural Surveillance of public and semi-private spaces, in particular, entrances to a development, paths, play areas, open spaces and car parks.
- Defensible space and the clear definition, differentiation and robust separation of public, private and semi-private space, so that all the spaces are clearly defined and adequately protected in terms of their use and ownership.
- Lighting of the development, in particular streets and paths.
- Design and layout of pedestrian, cycle and vehicular routes into and within the site, including how these integrate with existing patterns.
- Landscaping and planting, in particular, hiding places and dark or secluded areas should not be created.

8.57 The design and layout of access opportunities is of fundamental importance to designing out crime and needs careful consideration to avoid the creation of opportunities for crime. The 'Places, Streets and Movement: A companion Guide to Design Bulletin 32 - Residential Roads and Footpaths' provides advice on security issues in relation to the design of routes and connections. It emphasises that while clear and direct routes through an area for all forms of movement are desirable, they should not undermine the 'defensible space' of particular neighbours.

8.58 In practice this means that Secured by Design status for new housing developments can be achieved through careful design and the use of a limited number through routes, so that they are well used, effectively lit and overlooked, thereby creating a safe and secure atmosphere (www.securedbydesign.com). To aid this process, public spaces and routes

should, where possible, be defined by frontages that are visible from the street and are able to offer surveillance of the street from their occupants.

8.59 Developers should, at an early stage, seek advice from the Police Architectural Liaison Officer on designing out crime.

Table 3: Designing Out Crime

	Do:	**Don't:**
Routes	•make routes direct; •ensure they follow desire lines so that they are well used; •ensure routes are overlooked; •make sure routes are well lit; •ensure routes feel comfortable.	•make indirect routes; •provide unnecessary routes that will be little used; •create opportunities for people to hide close to paths, cycleways and entrances; •create dark alleys; •place routes between fenced gardens.
Structure	•use perimeter blocks; •create active elevations to routes; •plan in clear public and private space; •ensure public entrances are clear and visible; •gate accesses to private areas; •use robust, low maintenance materials; •mix compatible uses to create diversity of use.	•create long culs-de-sac; •place blank walls against public routes; •create indeterminate space without clear purpose; •create public entrances that are hidden from view; •provide parking courts that are not overlooked; •use poor quality materials that can be damaged easily or are difficult to maintain; •create areas of mono-use or monoculture that will be dead at certain times of the day.
Public space	•relate spaces to the movement network to ensure they're used; •design attractive public realm that people enjoy using; •ensure public spaces are defined by buildings and are overlooked; •use robust street furniture; •carefully consider the location of street furniture; •ensure soft landscaped areas are robust and clearly defined; •ensure spaces are well lit;	•create public spaces that are difficult to get to; •create non-descript spaces without a sense of place; •position back gardens against public space; •create undefined boundaries between public and private space; •use poor quality or weak street furniture; •position street furniture without considering its visual and functional impact on space

	•think about the integration of play equipment at an early stage; •design with due consideration for the ongoing management and maintenance of public spaces.	or the potential for its to be used to assist in the execution of crime; •use fussy landscaping without identifying a regime for appropriate management and maintenance; •place sub stations etc within public open space.
Security measures	•incorporate modest glazed panels or spy-holes in front doors; •specify good locks to all doors and windows; ensure cycle stores are secure; •ensure bin stores and sheds are secure.	•add in over specified or aggressive security measures that give a fortified appearance – they undermine the quality of buildings and space and give the impression that an area is particularly susceptible to crime; •create gated communities that weaken the scope for community integration.

LANDMARKS AND WAY MARKERS

8.60 A variety of built forms and public realm spaces provide identity and interest that enables people moving through an area to navigate by. This can be greatly enhanced through the provision of key landmarks that people can identify. Such landmarks could be distinctive places at the intersection of routes, distinctive buildings at key locations such as intersections and at the end of vistas, or the provision of towers to provide landmarks in a wider context. Existing buildings of special note, or individual mature trees, should be considered to create landmarks. Similarly visual stops need to be carefully considered and achieved using buildings or other focal points.

8.61 Small-scale points of reference that aid orientation and the creation of a local sense of place, such as war memorials, village notice boards, post boxes and distinctive, architectural features. These way markers give the sense of an unfolding journey when travelling through the development.

8.62 Using a particular house type as a landmark or way marker is acceptable, but if the same house type is repeated it loses its effectiveness and becomes commonplace and confusing.

PUBLIC AND PRIVATE SPACE

8.63 The network of streets, squares, parks and greens, is the fabric that binds the public space together. These places need to have a clear function and should be easily accessible. High quality materials should be used to

enhance the character and attractiveness of public spaces and maintain their quality in the longer term. House frontages should be visible from these public spaces and enable surveillance of the public realm by occupants.

8.64 Creating high quality public and private spaces requires architects and urban designers to develop places that suit the needs and activities of people rather than for cars. It also means designing public areas that are attractive, safe and comfortable, which are easily accessible and provide a range of facilities for the local community.

8.65 Opportunities should be found to incorporate existing features and to create squares, market places (streets wide enough to accommodate a market), greens, small seating areas, and play areas. Development is best designed around a pattern of connected streets and public spaces that can be easily understood; which should focus on busy pedestrian places that have an identifiable and accessible heart. The heart of the development should have a sense of enclosure and include features and landmarks that define it as a special place. Development should be designed to ensure there are no left over spaces, with each space having clear purpose and definition. They should provide a hierarchy of spaces with, spaces to go to, spaces to stop in and spaces to go through.

8.66 Spaces at and associated with the local centre should be designed in a manner that creates emphasis for the location, reinforcing its role as the heart of the neighbourhood. It should be of sufficient size to accommodate community activities, so they can take place in the heart of the community and not have to go elsewhere, where they would become disconnected from the community.

8.67 Policy SF/11 of the Development Control Policies DPD sets out the Council's open space standard of 2.8 hectares per 1,000 people, comprising:

- Outdoor Sport – 1.6ha per 1,000 people;
- Children's Playspace – 0.8ha per 1,000 people;
- Informal Open Space – 0.4ha per 1,000 people.

8.68 Public open space requirements should be provided in a variety of forms, formal pitch provision, informal games areas, formal park space, informal amenity space within development areas, play areas for different age groups and areas for wildlife conservation. Open space areas should be connected to provide a co-ordinated network. Ensure buffers are provided to protect any existing wildlife habitats from the pressures associated with people in new development areas. All residents should have some form of park space within a 400 metre walking distance of their home.

8.69 When there is a clear distinction between public and private spaces, management responsibilities can be clearly defined. The involvement of the local community in the design and management of local spaces can help to foster a sense of ownership and responsibility amongst local people. The Parish Council should be consulted if they are to take on the maintenance responsibility for public spaces.

8.70 Within more dense developments the importance of the quality external public space increases.

STREETS AND SQUARES

8.71 Street design should aim, wherever possible, to reduce the dominance of vehicles, and thus create an accessible and friendly environment. There should be spaces to encourage people to meet, spaces for social and 'spill out' activities, and places with seats on routes to local facilities.

8.72 Development should be designed to accommodate and reflect a hierarchy of street types:

- Primary distributor road for movement through the larger urban area.
- District distributor routes for movement through an area.
- Secondary routes for movement into and out of an area.
- Tertiary routes for movement within development areas.
- Mews courts for access to small numbers of residential units creating an intimate semi-private place.

8.73 A focus on highway design specifications has in the past led to many residential developments having a poor appearance, becoming car dominated and lacking local distinctiveness. In conjunction with Cambridgeshire County Council, the District Council has collated examples of good practice from other areas and the following points should inform highway design in new developments:

- Engineering standards should be used imaginatively and interpreted alongside other design considerations.
- Highway design should not be the leading factor in determining settlement form; there should be a hierarchy of spaces rather than a hierarchy of road types.
- Buildings should be arranged to fit the local context and to create interesting urban forms.
- Roads should fit within the spaces created; with adjustments as necessary to ensure that minimum road widths and other essential clearances are accommodated.

Reference should be made to the Cambridgeshire Design Guide for Streets and Public Realm (2007).

8.74 As outlined in Places Streets and Movement (DETR 1998) the use of vehicular tracking models can help in laying out buildings to suit the intended character of the street. The following design issues should be considered:

- All forms of movement need to be considered, but pedestrian, cyclist and access to public transport should take priority in the design process.
- Where possible streets should encourage social interaction with shared spaces rather than segregated areas and routes.
- Where segregated routes cannot be avoided they should be convenient attractive and safe to use.
- The aim should be to achieve traffic calming by passive means through the arrangement of building and spaces coupled with surface materials. This may include smaller corner radii rather than sweeping curves, the use of frequent junctions and fewer straight lengths of road, buildings walls, hedges and trees close to the road and allow for some on street parking.
- Traffic speeds within neighbourhoods should not exceed 20 mph.
- Bus routes may require suitable adjustments to roads. A permeable grid-based layout assists access and obviates the need for turning areas. Bus stops should be sited to achieve convenient access for as many people as possible and designed to allow for level boarding.

ENCLOSURE AND BUILDING LINES

8.75 Buildings need to properly enclose the spaces between them in order to achieve cohesion and a satisfactory urban form. A key factor in this is the relationship between street or space width and building height. The number and size of gaps in street frontage also has a significant impact upon the degree of enclosure. Traditional urban areas are built at relatively high densities and tend to feature continuous building frontages punctuated by occasional streets, lanes and archways. By contrast many suburban housing schemes are dominated by detached and semi-detached properties separated by modest gaps and garages. This gives little sense of enclosure, hinders energy efficiency and delivers a lower density of development.

8.76 The height/width ratio of a space influences the dynamics of the use of that space. If it is too low physical containment is lost, together with a loss of orientation; if it is too high a deep claustrophobic space results. Empirical studies have shown that certain height to width proportions are generally regarded as the most satisfying (The Planting Design Handbook, Nick Robinson, 2004). The following enclosure ratios between the height of the buildings and the distance between their frontages are used as a guide to achieve a satisfactory degree of enclosure:

- Squares Between 1:2 and 1:4
- Streets Between 1:1 and 1:2.5
- Mews Between 1:0.75 and 1:1

Fig. ? Diagram illustrating the ratios to achieve satisfactory enclosure

8.77 The way that buildings are aligned in relation to one another should be informed by the analysis of good examples of local urban form and the aim should always be to achieve a coherent, attractive and efficient layout.

8.78 The buildings enclosing the public realm create active frontages when the designs incorporate the provision of:

- Frequent doors and windows.
- No blank walls.
- Narrow frontages to create a vertical rhythm to the street.
- Enlivening edges with articulation of facades with projections, bays, porches, balconies, colonnades, awnings, providing interest and a welcoming feeling.
- Lively internal uses and activities visible from the street or spilling out onto the street.
- Opportunities to enliven the space and create interest using a hierarchy of buildings, a landmark building or by positioning a building more prominently, subserviently or closely, relative to its surroundings; using a hierarchy of views within the space and enhancing the group using glimpses between buildings or long views over green spaces and countryside; and creating an element of surprise.
- Opportunities for those inside to see out ‘eyes-on-the-street’.

8.79 An increase in the height of a building relative to surrounding buildings can, in certain instances, be justified by the building’s townscape role. Height can be used to provide variety to rooflines, form strong edges to otherwise undefined space, define nodes, provide increased presence for important spaces and act as local or district landmarks. The use of height other than in these instances undermines the legibility of a place to the detriment of the character of an area. A corner at the junction of two minor streets for example should be turned with a building that fronts both streets but the corner location in itself does not justify an increase in height.

Table 4: Enclosure and Building Line

Justification for increased height (above that determined by context bearing in mind the height/width guide)	Criteria
To provide variety to roofline. Townscape basis.	•Generally only appropriate where variation in roofline is already characteristic of an area. •Building should follow the plot width and building depth of adjoining buildings to avoid a massive appearance. •Height should not generally exceed 150% of the height of adjoining buildings.
To act as local landmark. Townscape basis.	•The townscape significance of a site revealed in a site and context appraisal should provide clear justification for a vista stop. •Height should not generally exceed 150% of the height of adjoining buildings.
To form an edge to a space. Townscape/functional basis.	•Appropriate where a large space warrants a built frontage for definition (e.g. a park).
To define nodes Townscape/functional basis.	•Typically only appropriate at the junction of two or more busy routes. •Importance of the node should be reinforced by the presence of non-residential elements in the block.
To provide presence to important spaces Functional basis.	•The space being addressed should have a clear civic or community function.
To act as a district landmark. Locational basis.	•The location should provide justification for a landmark.

FORMS, MATERIALS AND DETAILS

8.80 Building forms, materials and details can be drawn from surrounding examples, whilst also relating to the particular use proposed and qualities of space to be provided. Details and materials should be of as high a quality, or higher, as those found on existing adjacent properties. The existence of poor quality detailing and materials on existing properties will not be accepted as a reason for poor quality details and materials being proposed on a site.

8.81 The intention should be to specify new materials from local sources to minimise energy intensive transportation and costs.

Fig. ? Infill houses, Melbourn; Plum Developments. The rendered walls and tall window proportions make reference to the listed house, with contemporary metal roofing and window frames.

8.82 Traditional materials can offer guidelines for new buildings, although just as important is the quality of the element in its final form. For example, a wall may be designed to portray a feeling of mass and solidity, or be light and ethereal. Windows may be set deep within a recess, casting a shadow and appearing as openings 'punched' into a solid wall, or set flush with the face to maintain the plane of the wall. Each element carries a design intention, and appropriate justification should be presented for each.

8.83 Other than the purely decorative, detailing of materials should be related to the type of material and function of the new building. Timber rafters and beams may have expressed connections where they join, and brickwork may be detailed with projecting or recessed stringcourses. Careful study of historic details will reveal the design intent behind them; it is this intention that should be the starting point for new details, rather than the mimicking of form for its own sake.

8.84 Adjacent buildings should be studied for guidance on the proportion, form and spacing of window and door openings. The design should also take into account the orientation of the building (including the opportunity for passive solar gain) and the desired levels of daylighting. Architectural styles should be relevant to the particular location within South Cambridgeshire. Composition and elevational rhythms should clearly reflect context, even if the form of the building is contemporary.

8.85 Traditional forms may consist of simple wall planes with recessed windows under a pitched roof. Study and analysis will reveal the design intent of existing buildings; this could be based on historic use, or the status of the building, and it is this process that should be the starting point for the generation of new and appropriate building forms, related to choice of building materials and detail, whilst at the same time being specific to the village location.

8.86 The junction where a wall meets a roof is particularly sensitive. Eaves and verges may project or be cut tight back to the face of the wall. The wall may terminate with a dentil course or project past the roofline to form a parapet. Each type of detail places emphasis on a different element of the construction and should be consistent with the overall design intentions for the building.

8.87 Traditional walling materials found in South Cambridgeshire are, typically, buff coloured Gault Clay brick, stone (clunch, flint, claybatt and, occasionally, greensand) and timber weatherboarding. Windows are generally of timber or metal, and traditional roofing materials include clay tile (peg tiles and pan tiles), thatch and Welsh slate. Combinations of roofing and walling materials are common, often reflecting a hierarchy of building usage.

PUBLIC REALM AND LANDSCAPE FRAMEWORK

8.88 Everything in the public realm is landscaping; all hard and soft landscaping, relationship to the countryside, streets, and squares, open space, parks and water movement corridors. The landscape framework applies at two levels; the broader level is the structural landscape at the overall development scale; and the detailed level is landscape as setting for spaces and buildings.

8.89 The best development relates well to the topography and geography of a site and acknowledges the pattern of historical use of that site.

8.90 When setting out to design the landscape framework to a new development, the existing landscape character in its broadest sense should be respected, taking in issues of geology, topography, vegetation, hydrology, landmark features and local building character, as well as how to fully integrate the proposed development into landscape.

Table 5: Working With Site Features DC46

Achieve this:	By doing these things:	Examples:
Use existing positive features to create character	•Work retained buildings into new blocks. •Use ponds and watercourses for outlook. •Use specimen trees and shrubs as the focus of new development. •Use existing hedgerows to create structure for new development. •Front established routes. •Formalise informal routes.	
Work with the topography of the site	•Allow existing levels to suggest layout options. •Allow hedges and ditches	

	to influence layout and add structure for new development. •Retain all trees and hedges where practical.	
Retain uses that are important to the function of an area	•Work important existing uses into a layout in new or retained buildings.	
Accommodate below ground constraints in a workable layout	•Avoid disruption to below ground archaeology where possible •Where block structure permits align streets and spaces along utility easements for ease of access. •Explore the practicalities of rerouting services which preclude efficient layout options.	
Ensure protected species are safeguarded	•Protect habitat. •Avoid conflict with the built form. •Build in appropriate protection/relocation or other mitigation measures.	

8.91 Maximising the use of existing landscape features on the site will add instant maturity to any development. Existing views and vistas can be harnessed for the benefit of those who will live, work or visit the development. Care should be taken to ensure the development proposals do not obstruct such views and vistas spoiling peoples enjoyment of them.

8.92 The landscaping needs to be considered early in the design process. It is not something that can be successfully added after the event. The landscape proposals must therefore be included as an integral part of the design process and the Council will expect landscape proposals to be submitted concurrently with applications for full planning permission, rather than be left as a reserved matter to be sorted out later. A Landscape Design Statement will be required illustrating: how the design will integrate with the local character, how design will relate to the needs of the development and its future occupants, and that the design includes sufficient space (made up of practical areas) for the planting.

8.93 Developers should ensure sites are designed to integrate the built forms with their encompassing spaces to create a unified whole with no spaces left over, that are not properly incorporated into the design of any building plot or public realm area.

8.94 Attention should be paid to the retention, integration and future maintenance of important landscape elements such as trees, hedgerows and ground-slopes. Consideration should be given to the use of products such as Silva Cell to direct tree root growth.

8.95 Landscaping is an integral part of any development. It applies equally to housing, business and industrial developments and can fulfil one, some or all of the following functions:

- Complement and/or enhance the proposed built form, providing both a setting and an outlook.
- Assist in integrating development into the existing landscape – with consideration to both visual and landscape characteristic aspects.
- Screen the development.
- Be an entity in its own right.
- Create a sense of place.
- Provide shelter and ameliorate noise and/or air pollution.
- Provide environmental benefits through carbon fixing, i.e. taking in carbon dioxide and emitting oxygen.
- Provide wildlife habitats – assisting in meeting biodiversity requirements.
- Create enclosure and define boundaries.
- Soften and frame views.
- Food production, either on plots, allotments, or smallholdings.

8.96 Spaces around buildings should be designed to integrate with the buildings to enable them to provide clean cool air for natural ventilation and to cool exhaust air from buildings; to provide shade in the summer to reduce the demand for artificial cooling; to reduce the heat island effect by cooling the urban areas.

8.97 The public realm should be designed and managed to enrich people's experience, it should allow for movement and interaction, it should delight the senses, make people feel comfortable and be easy to maintain.

Table 6: Public Realm Design

Achieve this:	By doing this:	Notes:
Safe space	•Ensure space is overlooked. •Provide lighting that is appropriate for its setting. •Make routes direct. •Relate spaces to routes. Plan focal space where footfall is greatest. •Create comfortable spaces where people enjoy spending time. •Predict misuse and design it out.	People help to police space. Create pride in civic space
Accessible space	•Relate spaces to the movement network to ensure they're easy to get to. •Think about all users. •Make public space easy to use. •Avoid clutter. •Smooth the public/private transition. •Consider access for emergency vehicles and refuse freighters.	Ramp integrated into steps. Refer to 'Streets for all'
Useful space	•Ensure all space has a clear purpose; avoid 'space left over'. •Design with the purpose of the space in mind to ensure space is fit for purpose. •Avoid unnecessary objects that clutter space. •Consider microclimate at site planning / layout stage and in determining the relationship to adjoining buildings.	Awkward shapes can be difficult to maintain.
Attractive space	•Make use of natural assets; water, trees, hedges or slope. •Design space with the same care as the buildings that enclose the space. •Use good quality surfacing. •Be imaginative and make the most of small spaces. Create simple geometric patterns or informal designs that flow with and reinforce space. •Use material changes to identify intentional changes in use or character. •Mark parking spaces out subtly, or by changes in material. •Play down arbitrary changes in surfacing in overly complex designs or at public/private boundaries.	All new shared surfaces in setts e.g. tegular. Avoid complicated patterns that are unintelligible to the user.

	•Co-ordinate and combine street furniture. •Reduce visual clutter. •Place street lighting on buildings where practical. •Integrate public art into the design of spaces. •Incorporate appropriate tree, shrub and other planting. •Ensure boundary treatments work with the space. •Get the detailing right.	See guidance on public art. Manhole covers etc workmanship
Space that lasts	•Consider future maintenance – keep landscape design simple where ease of maintenance is important. •Get clear management responsibilities put in place from the outset. Draw up maintenance regimes at the design/planning stage. •Use durable products; natural materials weather better than artificial ones. •Remember trees grow; think about both their immediate and eventual impact on buildings and space. •Use indigenous planting species where possible and foster biodiversity. Greater consideration of ecological principles at design stage can improve biodiversity in new open space. •Select species that do not require irrigation once established and will survive in predicted changes to climatic conditions. Get the right plant for the right place to ensure planting thrives.	Avoid the use of materials that will result in visible patches of reinstatement. Liaise with landscape managers to see what is practical. Avoid the use of materials that discolour or fade, or become brittle in sunlight. Brownfield sites can have surprising nature conservation potential. Open space is often too simplistic in design and too intensively /uniformly managed to have much nature conservation value, but this need not be the case.

PRIVATE GARDENS AND AMENITY SPACE

8.98 The design of the grounds surrounding buildings are as important as the design of the buildings themselves and the two should be designed as an integrated whole.

8.99 Every home should have the benefit of some private or communal outside amenity space. This can take the form of private gardens, communal gardens, roof terraces or balconies. Within denser development of new settlements and urban extensions, the careful design of outside amenity spaces is required to optimise the benefits of good locations and ensure these spaces offer maximum benefit to new residents. In such compact developments there will be an emphasis on private balconies and communal gardens/terraces. Relatively modest balconies, roof terraces and communal decks can offer significant benefit to residents of urban developments where they are properly integrated into new development, are secure, quiet, attractive and have good microclimate.

8.100 Private gardens should:

- Be of a size and shape to allow effective use for the number of people the property is designed for, for growing plants or vegetables, for general amenity, for play in family housing, etc. and where possible be oriented to allow sunlight into each garden.
- Incorporate a private sitting out area positioned close to internal living accommodation.
- Incorporate means of enclosure that do not undermine the quality of adjoining, especially communal, spaces; whilst avoiding excessive wall or fence heights, which could overshadow small gardens and discourage interaction between neighbours.
- Be placed away from public areas within the development.
- Feel safe and secure.
- Enable flexibility of use and personalization.

8.101 Communal gardens including roof terraces should:

- Be convenient to use.
- Be clearly distinguished from the public realm.
- Not be bisected by vehicular routes to parking courts.
- Feel safe and secure.
- Not unduly affect the privacy of residents' internal accommodation, particularly those at the same level as the communal space, or below in the case of roof terraces.
- Incorporate a variety of semi private sub spaces to permit flexibility of use.
- Be designed with interesting planting, hard surfacing and places for sitting and socializing.
- Be properly managed and maintained.

8.102 Balconies should:

- Benefit from sunshine and good microclimate (including air quality).
- Be well related to internal accommodation.
- Be of sufficient size as to permit outside sitting/dining.
- Have good outlook.
- Be secure and relatively private.
- Be placed on the quiet side of the building where possible.
- Relate well to the architecture of the building on which they are placed.

8.103 Ideally residential units should be provided with access to the following sizes of private amenity space. Each one or two bedroom house should have private garden space of 40m^2 in urban settings and 50m^2 in rural settings; whilst each house with 3 bedrooms or more should have private garden space of 50m^2 in urban settings and 80m^2 in rural settings. Ground floor apartments should have a minimum of 10m^2 private amenity space immediately outside their living accommodation, or use of a communal garden, where 25m^2 is allowed for each apartment. Upper floor apartments should have use of a private balcony, of a minimum of 3m2, plus use of a communal garden, where 25m^2 is allowed for each apartment. This provision is in addition to the stated requirements for car parking and bin storage. Allotments provision is also required.

8.104 Boundary treatments such as garden walls, fences, railings and hedges should relate in scale and material to the overall streetscape and the character of the context, whether urban or rural.

8.105 Streets can be characterised by trees, hedges and shrubs that overhang and define the edges of pavements and roads, but care should be taken when encouraging such features that they do not obstruct footpaths, cycleways or roads. Front, side and back gardens should be considered in conjunction with the new building/s, so as to create a plot design coherent with the street context. New indigenous planting will be encouraged, including trees.

Fig. ? Infill gardens, Melbourn. Boundary treatments include woven willow fences, and gardens are planted with new trees whilst retaining existing trees

Fig. ? Large scale mixed used infill development, Papworth Everard. Buildings include townhouses and flats around a new public open green space and a new public library with retail development.

PAVING

8.106 Paved areas, including carriageways, footpaths, cycleways and other hard surfaced areas, are a major element of any new development and, as such, have a significant impact on the character of that development. The design of paved areas should be considered in its entirety as a unified design from building face to building face. Paving should be designed in a manner that creates visual interest as well as meeting the functional requirements.

8.107 Natural, high quality paving materials, such as stone, gravel and brick, as well as quality modern materials, can contribute positively to the appearance of outdoor spaces. Materials should be appropriate to the character of the development and its context. In Conservation Areas it is especially important to complement local traditional patterns, textures and colours, and in rural areas the character of simple gravel or grass finishes should be preserved.

8.108 Muted colours are generally considered more suitable for paving materials, while large, unbroken areas of any particular surface materials should be avoided, especially where there are in situ materials that are protected by Listed Buildings legislation or cannot readily be lifted and re-laid. Areas can be successfully broken up using materials of the same colour but with different textures or simple patterns. Creative approaches can result in an equally functional but significantly more attractive alternative for highways requirements such as avoiding dividing areas of paving with concrete edging strips to identify the limit of highway adoptions.

8.109 Concrete kerbs with a high up-stand create a harsh and over-engineered appearance. They are particularly inappropriate in shared use and low traffic areas. Changing levels to reduce or omit the upstand will improve the appearance and enable wheelchair access, and using natural materials such as granite will improve the texture and appearance of the edging.

8.110 Granite or concrete setts may be useful for defining areas such as parking bays and shared-surface roads. A bound gravel or shingle surface dressing may be suitable for paths, private driveways, squares, and other shared-surface areas designed for low vehicle speeds and movements. It is more appropriate to use changes in surface material rather than painted demarcation to define changes of surface use.

8.111 Consideration should also be given to the appropriateness of the materials selected, with the use of non-slip and non-trip materials, especially where the elderly or infirm will walk. Where possible porous paving materials are encouraged to maximise surface water percolation into the ground and minimise run-off.

PARKING

8.112 One of the major challenges in the design of new residential developments is to accommodate the car in ways that are visually unobtrusive, convenient and safe to use. The number of parking space to be provided should be assessed using the Council's adopted parking standards as set out in the Development Control policies DPD. These are a maximum level of provision and it may be possible to provide fewer spaces where there is good access to facilities and public transport. Consideration should also be given to the provision of car clubs.

8.113 Parked cars should not be allowed to dominate the street scene; they should preferably be accommodated within, beneath, or at the side or rear of buildings. If parking is not on-plot it should be as close to the house as possible for convenience and to prevent people parking on the roads. In most cases parking spaces and garages located within the dwelling plot should be recessed from the building frontage so as to lessen their visual impact. To avoid cars being displaced from garages into the street, it is important that garages are of sufficient size to accommodate a large car together with cycle storage, some degree of other storage and room to pass garaged cars with wheeled bins, if the primary route for taking them to the back-of-footpath is through the garage.

8.114 Parking facilities should be viewed as public spaces that have cars in them at certain times, and should be created as attractive functional spaces, with planting used to avoid the street scene becoming dominated by the view of cars. The retention of existing trees, in combination with appropriate landscape materials and detailing, can create low key and attractive parking areas.

8.115 Any off-plot provision of communal parking courts must be in small, well lit, and overlooked by neighbouring properties, for security, otherwise they may become underused, problem areas. Larger unsupervised parking courts, especially in the heart of blocks that remove the security of the rear of properties are not acceptable as they will be little used, resulting in cars being parked on the streets. One of the benefits of higher density development is that it makes undercroft or basement parking economically viable; this is an option that minimizes the visual impact of parking while maximising the land for development. However it is important that it does result in awkward or unbalanced elevations.

8.116 Adequate provision must be made in all cases for visitor parking and service vehicles.

PUBLIC ART

8.117 Public art should be designed in parallel with the design of buildings and spaces, as an integral part of them and should not be seen as isolated features to be bolted-on to buildings or placed in spaces at a later time. South Cambridgeshire District Council has adopted a public art policy and published an SPD on Public Art. The term Public Art refers to works of art in any media, which contributes to the identity, understanding, appreciation and enhancement of public places. Public Art can promote a sense of place and pleasure for example by evoking local history, be inspiring and/or thought provoking. In South Cambridgeshire Public Art has a role to play in neighbourhood and community development.

8.118 Public art is described as; any work by a recognised artist in a public place, and this policy applies to:

- Residential developments comprising ten or more dwellings.
- Other developments where the gross floor space created is 1000 m^2 or greater, including offices, manufacturing, warehousing and retail developments.

8.119 The artwork may be large or small, mobile or static, integral to a building or freestanding, fine art or functional. For example, public art may be produced in the following forms:

External Public Space – Sculpture; Mural; Relief; Feature Window; Canopy/Entrance Feature; Paving; Landscape Art; Bespoke Street Furniture; Bespoke Signage.

Internal Public Space – Sculpture; Mural; Painting; Textile; Glass; Flooring; Crafts; Exhibition space for changing exhibitions.

Non-Site Specific – A contribution may be considered though the general public art strategy for off-site works that may be more easily accessed by the public.

8.120 The Council's policy encourages developers to dedicate between 1% and 5% of the associated construction costs of the capital project to public art. The council will initially negotiate the principle of an agreement with developers and their agents to commission art within the development, which will then be secured through a Section 106 Agreement that will be attached to the planning permission for the development.

8.121 The Council encourages the use of local artists from within South Cambridgeshire, but developers are free to choose and appoint any recognised artist and work by nationally notable artists is also encouraged. The developer's architect or landscape architect/designer should be able to

assess possible types and locations of art in relation to the project design. Ideally the appointed artist will work alongside the architect. It is important that at the outset an artist's brief is prepared. This will clarify what kind of artist is required for the particular development and establish: a theme, location(s), budget, programme, identity of the client and any requirements for community involvement (including contacts).

8.122 Developers are advised to ensure that technical consultations and approval for the artwork are carried out in advance of the installation. These may include:

- Statutory utility companies (for underground services in the location of the installation).
- The Highway Authority (for traffic safety and works within public highway land).
- Parish Councils (for works on public open spaces).
- Health and safety issues and Environmental Health issues.
- Whether the art installation requires planning permission in its own right.

8.123 Any resulting art installation will require maintenance during its life. The maintenance will vary depending on the nature of the intervention, but may include running costs for lighting etc, and responsibility for maintenance of the artwork will need to be carefully considered when the artist's brief is prepared. It is anticipated that the investment in the artwork includes a sum for maintenance. Provision for future maintenance should be included within the Section 106 agreement.

8.124 More detailed advice on the public art policy and the procurement process is available in the Public Art SPD or from the Council's Arts Development Officer.

STREET FURNITURE

8.125 Street furniture should be selected and designed into the public realm from the outset, in an integrated manner. It should be carefully selected for its appropriateness for its location. Street furniture is a necessary part of the street-scene in terms of giving information and ensuring the street is suitably lit and a safe place, but it is important that the location, amount, design and materials of street furniture is carefully controlled to avoid unnecessary visual and physical clutter.

8.126 Where appropriate, street lighting and street nameplates should be mounted on buildings. Where posts are required for street lighting or road information, these should be used in a co-ordinated manner and carry more than one sign, thereby reducing the number of posts in any one street. The

street furniture, including lighting, seating and local direction signposts, should be chosen imaginatively to complement the building design.

LIGHTING THE PUBLIC REALM

8.127 As part of and integrated with the design of the public realm, a lighting strategy should be developed. This should not only ensure the provision of well lit public areas, to assist in the creation of a safe and secure environment, but should also support and add emphasis to the hierarchy of public real spaces. Key landmarks, building and features should be lit to provide visual interest and support legibility for people moving through the development.

8.128 Where possible, lighting should be incorporated into the design of buildings and spaces, or wall mounted, minimising the number of freestanding lighting columns. To reduce the overall number of columns and posts in the public realm, other signage and/or landscape furniture should be attached to lighting columns where they are used.

8.129 Lighting of external areas will have an impact on surrounding properties. Consideration should be given to the appearance of lighting units, their efficiency in lighting the areas and features intended, and prevention of light spillage that could cause light pollution to other locations and adjacent landholdings. Lighting should also be efficient in its consumption of energy to minimise the production of greenhouse gases arising from the energy generation to power the lighting.

ADVERTISING, LIGHTING AND SIGNAGE

8.130 Advertising, lighting and signage are aspects of commercial developments that can have a significant impact, but are frequently not considered as part of the design. This can result in excessive lighting and signage, frequently of poor quality, being added to a development after its completion. The Council will expect planning applications for commercial developments to show how advertising, lighting and signage are to be integrated into the design, with the expectation that they will be kept to a minimum, use suitable materials and avoid light pollution.

8.131 Where the proposals replace existing signage or affect a Conservation Area or Listed Building, a traditional, simple and minimal approach is appropriate. The intention should also be to retain any historic signage insitu.

UTILITIES

8.132 Developers are strongly encouraged to locate all services underground to minimise visual clutter. Common service trenches should be employed to maximise the areas available for planting of trees and shrubs for the visual

enhancement of the public realm spaces and the improvement of the setting of the buildings themselves.

8.133 Building Regulation B5 requires access for fire tenders to 15% of a dwelling's perimeter or to within 45m of every point of the building's footprint.

8.134 The location of external meter boxes needs to be considered as part of the detailed design process to ensure they are not unduly prominent in the street scene, with carful attention paid to their position and colour.

SOLAR PANELS

8.135 The Council encourages the design of all new buildings to minimise their environmental impact and be robust in changing climatic conditions.

8.136 Solar panels should be incorporated into the design of the roof rather than be add-on units above the roofline, this will retain the visual integrity of the built form.

8.137 Where solar panels are not incorporated into a building from the outset, the roofs should be designed to enable their easy later addition with minimal visual disruption of the roof form.

8.138 Where the proposals affect a Conservation Area or Listed Building, the siting of the solar panels should be carefully considered and unobtrusive. Further guidance is contained in the Council's Listed Building and Conservation Areas SPDs.

SATELLITE DISHES AND OTHER PARAPHERNALIA

8.139 Satellite dishes need careful consideration, especially when they are to be located in proximity to a Conservation Area or Listed Building. As a general rule satellite dishes should be located on secondary elevations and rear elevations. Where this is not technically feasible or affects a Listed Building or Conservation Area, alternative options should be considered, such as siting the satellite dish on a pole in the rear garden, or on an outbuilding, subject to not being visually intrusive into public areas or the setting, or detrimentally affecting the amenity of neighbours.

CHAPTER 9

ENVIRONMENTAL HEALTH ISSUES

WASTE COLLECTION AND RECYCLING

9.1 Safe and secure provision should be provided on-plot for the storage of the Council's waste and recycling materials collection receptacles, for all non-residential buildings, without creating a nuisance or being unsightly for the occupants or the general streetscape.

9.2 To prevent the storage of such materials becoming a nuisance or unsightly in the future, the design of such temporary storage facilities should be sufficiently large to accommodate future expansion of recyclable materials collected and therefore an increase in the number of recycling containers required to be stored.

9.3 Access for refuse, delivery and emergency vehicles is best provided by means of permeable grid layout, but where dead ends are unavoidable, turning heads must be provided. Development layouts must accord with Building Regulation H6 and the requirements of the RECAP Waste Management Design Guide 2007 and the Cambridgeshire Design Guide for Streets & Public Realm.

9.4 To reduce the demand for potable water and reduce the volume of water discharged into the sewer and river systems all developments should collect and store rainwater for reuse for flushing toilets and irrigating landscaped areas and collect and store grey-water for flushing toilets. Any uncollected and rainwater should be held on site in sustainable drainage systems to reduce the volume and rate of discharge into the surface water sewer and river systems.

9.5 Guidance contained within an emerging County Council SPD will also relate to policies 16 and 28 in the emerging Minerals & Waste Core Strategy covering Waste Minimisation, Re-use, and Resource Recovery and the provision of Household Recycling Centres.

9.6 The RECAP Guide addresses the issue of waste management in new developments and redevelopments of a residential, commercial or mixed (residential and commercial) nature. It is to be used by:

- Developers and designers to ensure effective segregation, storage and collection of waste materials; and
- Planning Authorities in assessing each planning application to ensure that waste management needs are adequately addressed.

9.7 The Guide covers the following areas:

- Waste Storage Capacity
- Waste Storage Points
- Waste Storage Methods
- Waste Collection
- Recycling Centres
- Bring Sites
- Waste Management in flats & apartments
- Technical Appendices

9.8 The aims of the Guide are as follows:

- Detail the waste segregation, storage and collection requirements that designers and developers need to satisfy.
- Provide a strategic tool for use by Planning Authorities when assessing development applications.
- Address the unique waste management problems presented by high density (residential) developments.
- State the requirements for developers regarding the funding and provision of additional waste management infrastructure.
- Highlight the financial implications of waste management upon developers.
- Highlight examples of good practice demonstrating what can be achieved.
- Contribute to sustainability and reduced environmental impact.

9.9 The RECAP Guide includes a 'ToolKit' to be used by developers to set out how they have addressed waste management requirements as part of their planning application. The ToolKit is on the 1APP list of required documents and as such a completed ToolKit must accompany any planning application in order for it to be registered as a valid application.

9.10 The purpose of the Draft SPD mirrors that of the RECAP Guide and sets out a series of development principles based on recognised good planning and design practice.

9.11 The Draft SPD provides advice on the design and provision of waste management infrastructure in new developments and redevelopments of a residential, commercial or mixed (residential and commercial) nature, including advice on:

- **Internal storage capacity**: including a requirement to provide between 35-40 litres of space within the kitchens of new homes to give residents sufficient space to allow for recycling and composting (as appropriate).

- **External storage capacity**: the Guide sets out recommendations for amount of space which is required to store bins for different types of waste to serve residential and commercial developments including different standards for communal bins in relation to flats/apartments. In the case of commercial development the amount of space required is dependant upon the use of the land e.g. requirements for restaurants and fast food outlets are greater. For residential development it is dependant upon whether it is a house or the number of rooms in the case of flats/apartments (excluding kitchens and bathrooms). For example a single house would need to provide 775 litres with a one bedroom flat with a living room in a 4 floor development would provide 320 litres.
- **Location of Waste Storage:** issues which should be considered in relation to location of bins including ensuring that they are accessible for both users and collection crews and that the amenity of residents is protected.
- **Waste Storage Infrastructure:** sets out a minimum specification for compounds to store residential and commercial waste above-ground and guidance in relation to the design of underground facilities.
- **Highway Design**: requirements for the design of new roads given the emphasis away from car dominated environments in urban design to take into account the need for waste collection vehicles to serve new developments effectively.
- **Additional waste management measures**: identifies a range of complementary measures, which can be introduced to support the effective management of waste e.g. educational schemes.

9.12 The Cambridgeshire Design Guide for Streets & Public Realm (Cambridge Horizons 2007), complements national design guidance for waste and recycling, such as the Government's Manual for Streets to promote the highest possible standards in all new developments, large and small. The purpose of the design guide is to set out the key principles and aspirations that should underpin the detailed discussions about the design of streets and public spaces that take place on a site-by-site basis.

AIR QUALITY

9.13 Air pollution and poor air quality can have detrimental impacts on health and the amenity of users of land in terms of odour, dust and nuisance. Policy NE/16 within the Local Development Framework aims to improve air quality in the District and helps to implement the objectives of the Air Quality Action Plan (AQAP), relating to land use.

9.14 District and the planning system has a key role in protecting people from unacceptable risks to their health and in providing an adequate protection to the amenity value of land. Low Emission Strategies and S106 Agreements can act as a main instrument to minimise the impact of development on the

local community and to ensure the developer carries out measures to provide benefit to the environment and community.

9.15 Part IV of the Environment Act 1995 sets out the system of local air quality management in which local authorities take the lead in the form of the National Air Quality Strategy (NAQS). The NAQS contains health based air quality objectives for common pollutants.

9.16 Under the above legislation, South Cambridge District Council is required to carry out periodic reviews of air quality in their area and to assess against the stated objectives. Where such objectives are unlikely to be met by the target year, local authorities are required to designate an Air Quality Management Area and consequently create and implement an Air Quality Action Plan, which contains the measures required to reduce pollutant concentrations and lower emissions in order that the national objectives are met. This not only aids in the objectives for sustainable development, it also improves the quality of life for existing communities.

9.17 Air quality is a material planning consideration and clear links have been established between air quality and land-use planning with transport identified as the main source of pollutants in towns and cities. By guiding the location of new development and preventing or mitigating the exposure of sensitive receptors to poor air quality, reducing the need to travel and promoting smarter and cleaner transport choices by considering a Low Emission Strategy (LES), land use planning and design will form an important element of an integrated strategy to achieve the air quality standards and objectives.

9.18 Air pollution and climate change are intrinsically linked. Both arise from the emission of combustion processes to the atmosphere. Exhaust emissions including carbon dioxide, nitrogen dioxide and particulate matter, continue to increase from transport and transport is the main reason for the Air Quality Management Area (AQMA) declaration in South Cambridgeshire following a national trend for concentrations of nitrogen dioxide and particulate matter to breach health based standards. South Cambridgeshire's AQMA is located along a stretch of A14 to the North of Cambridge City and further information and a map of the AQMA can be viewed via the following link: http://scambs-airquality.aeat.co.uk/index.php?action=chapter&f_page_id=7

9.19 Low Emissions Strategies (LES) provide a package of measures to help mitigate the transport impacts of development on local air quality and on climate change. The LES is secured through a series of planning conditions and legal obligations.

9.20 This section of the SPD will bring together the Council, the County Council, the Highways Agency and, through the improved use of s106 agreements,

developers in working towards improving the local air quality and reducing emissions. In addition, it will help towards achieving the target within the new National Indicator NI194.

9.21 The South Cambridgeshire Local Development Framework contains Policy NE/16, relating to emissions and air quality. The policy reads:

"1. Development proposals will need to have regard to any emissions arising from the proposed use and seek to minimise those emissions to control any risks arising and prevent any detriment to the local amenity by locating such development appropriately.

2. Where significant increases in emissions covered by nationally prescribed air quality objectives are proposed, the applicant will need to assess the impact on local air quality by undertaking an appropriate modeling exercise to show that the national objectives will still be achieved. Development will not be permitted where it would adversely affect air quality in an Air Quality Management Area."

9.22 When will air quality and emissions be considered?

- The Council will identify any developments that have the potential to contribute significant emissions to the local area.
- Any developments within or adjacent to an AQMA boundary.
- Proposals that will result in increased congestion, a change in traffic volumes – an AADT or peak traffic flow which increases by more than 5% for roads with more than 10,000 AADT.
- Proposals which change the traffic composition (.e increase the proportion of HGV's).
- Proposals that include car parking or the increase in provision for more than 300 spaces.
- Developments that could give rise to significant dust emissions in areas where people and/or commercial activities could be exposed.
- Pre-application discussions with the developer to exchange ideas and determine the extent of the LES and possible contributions towards air quality improvements using S.106 agreements.

9.23 What will the LES include?
The LES will include all proposals to mitigate the impact of emissions including transport emissions arising from the development. This could be travel to work plans, priority parking for low emission vehicles or the infrastructure for recharging electric vehicles.

9.24 Emissions Impact Assessment
This will be an identification and quantification of all emission sources from the development.

9.25 Package of mitigation measures
This should be a full detailed explanation of the mitigation measures intended by the developer, also including a statement of intent for S.106 contributions if this is necessary. It will be linked to the Emissions Impact Assessment to show how reductions, using a variety of methods and technologies, will be achieved.

9.26 Applicants should be directed towards the following documents for help in achieving a low emission development:

- Low Emissions Strategies – using the planning system to reduce transport emissions, Prepared by the Beacons Low Emission Strategies Group August 2009, Available from: (to be confirmed as only just been adopted by Defra).
- Air Quality – A Guide for developers South Cambridgeshire District Council, 2009, Available free to download at: (coming soon).
- Planning Policy Statement 23 (PPS23) Planning and Pollution Control, Defra, 2004, Available free to download at: http://www.communities.gov.uk/publications/planningandbuilding/planningpolicystatement23.

9.27 Further guidance is provided in Appendix 4.

NOISE

9.28 It is a fact of life that we all make noise, that is we all make “unwanted sound” in one form or another, often unintentionally. Noise is an unavoidable part of our lives. However, it can have an adverse effect on peoples’ quality of life and there is emerging medical evidence that exposure to unwanted sound can affect our health and welfare.

9.29 In relation to noise control, prevention by preempting and avoiding or mitigating to an acceptable level, is better than cure. Protection against noise in the construction, design and layout of residential developments is essential to ensure that existing or future residents are not subjected to unacceptable levels of noise in their own homes or external amenity areas, part of sustainable development in terms of noise.

9.30 The likelihood of noise affecting future residents is a key factor in assessing the suitability of a site for residential use.

9.31 Planning Pollution Guidance 24 (PPG 24: 1994) guides Local Planning Authorities (LPAs) on the use of their powers to minimise the adverse effects of noise and outlines the considerations taken into account in determining planning applications both for noise-sensitive premises and for those, which generate noise. PPG 24 acknowledges that noise can have a significant effect on the environment and on the quality of life enjoyed by

individuals and communities, so its consideration and control is an important part of sustainable development in providing a healthy and quality living environment and is integral to place making.

9.32 With higher densities, more mixed-use development, and more demand for late night activities, good acoustic design needs to be actively promoted if noise is not to become a threat to SCDC growth areas and quality of life. Environmental Health Officers and/or acousticians should be involved at an early stage.

9.33 Noise can be a material consideration in the determination of planning applications and the planning system is tasked with guiding development to the most appropriate locations whilst advising on noise design issues.

9.34 The underlying principles of PPG 24 advocate the use of the planning system to ensure that, wherever practicable:

- New noise-sensitive developments are separated from major sources of noise such as road, rail and air transport and certain types of industrial development having regard to both the likely level of noise exposure at the time of the application and any increase that may reasonably be expected in the foreseeable future.

  This includes the introduction of new noise sensitive development such as new residential dwellings, schools and hospitals into or locating near to an existing noisy environment, such as noise from road, rail traffic, aircraft, commercial / industrial and or agricultural related and existing building services plants or equipment.

- New development involving noisy activities that have the potential to generate noise should, if possible, be sited away from noise-sensitive land uses.

  Development that have the potential to generate noise are likely to be commercial / industrial and agricultural uses with associated process equipment and or building services plant of one description or another, usually air-conditioning / ventilation equipment. In addition, noise associated with vehicular movements to a development for example deliveries / collections or a significant increase in general traffic movements off site outside the development site can also have an impact on residents. Applications associated with pubs, clubs and places of entertainment are dealt in the attached appendix on other noise issue.

9.35 Planning balances various competing environmental, social and economic needs and where it is not possible to achieve separation of incompatible land uses, for example noise sensitive development from noisy activities,

local planning authorities should consider whether it is practicable to control or reduce noise levels by careful urban design, or to mitigate the impact of noise, through the use of conditions or planning obligations. However, an inflexible approach would inhibit regeneration and development and place more pressure on green-field sites.

9.36 Solutions to acoustic problems can be technically complex and expensive and very expensive if considered retrospectively. In all but small developments or particularly quiet locations, it is likely that specialist advice will be required from acoustic consultants.

9.37 Delaying contact with such specialists until later in a project may result in avoidable additional costs being incurred at the design and construction stages.

9.38 Where it is unlikely that residents will be able to keep windows open or sit on/in a balcony/garden without being bothered by one or more external noise sources, such as traffic, industrial noise or customers of entertainment venues, noise will be a material planning consideration and will require careful consideration at the pre-application and design stage.

9.39 Mitigation of the effects of noise can be achieved by:

i. Control at the source (measures to reduce noise emissions at source such a quiet plant, noise insulating buildings, plant enclosures or quiet road surfaces and or noise barriers).
ii. Control of the transmission path (adequate distance separation, building location, form and orientation, screening / noise barriers).
iii. Control of noise at receiver (sound-conscious design: internal planning such as non habitable rooms providing a buffer, orientation of noise sensitive rooms and balconies and gardens way from noise by barrier dwelling blocks, single aspect courtyards schemes and staggered terraces, careful fenestration, noise insulation scheme for the building envelope of noise sensitive buildings and also buildings generating noise, reduced external amenity, acoustic ventilation).
iv. By controls over the operations that generate the noise (such as controls over the hours of operation, deliveries / collections).

9.40 The applicant is encouraged consult the LPA at an early stage about the possible use of such measures and whether they are desirable or achievable, as this may enable the incorporation of such noise mitigation measures into the design of the proposal before it is formally submitted for determination, the concept of “Sound-conscious urban design”. Noise mitigation measures integrated into the overall design of the development should be first in a hierarchy of noise mitigation measures. The control of the noise at the receiver in terms of noise insulation of the building envelope shall be a last resort and the final line of defense against adverse external noise.

9.41 Further guidance, policies and environmental noise standards detailed in Appendix 6 should be followed for all residential development, in areas where internal or external noise is a factor and when noisy development is proposed.

ODOUR

9.42 Odour, dust or fumes from plant serving any planning applications for commercial, industrial and agricultural buildings should be considered in relation to nearby sensitive receptor development. The Council may include a condition requiring the approval in writing by the Local Planning Authority of the location and type of such plant and details of any equipment for the purpose of extraction and/or filtration and/or abatement of fumes and or odours before the use of the plant commences.

9.43 It will be necessary to ensure adequate discharge and or abatement of odours to ensure odour nuisance and or malodours are not caused and to protect the amenity of neighbouring premises.

9.44 Extraction, filtration and odour / fume abatement systems must also be designed so that they do not have an unacceptable impact on visual amenity.

9.45 The installed systems must not appear as an incongruous feature in the street scene. To be acceptable the proposed extraction system will have to be:

- Located preferably to minimise its visual impact on the street scene;
- Of a colour, finish and design to blend in with the buildings to which it is attached, incorporating cladding where appropriate; and·
- Installed within the building where practicable and particularly where the proposal is within a conservation area or within the setting of a listed building.

9.46 If unacceptable smells and fumes cannot be prevented by means of an effective extraction or abatement system, or if ducting cannot be installed without significant detriment to visual amenity, planning permission will not normally be granted.

9.47 Odour can be a prevalent problem at low levels of concentrations and has the potential to impact on a wide area and affect amenity.

9.48 When there is the potential for odour and or fumes to be generated SCDC may require the submission of a detailed odour assessment with a planning application, if it is felt that there will be serious detriment to the amenity of the area.

9.49 If it is considered odour / fume generation can be abated to an acceptable level then a planning condition may be imposed requiring the submission of details of equipment for the purpose of extraction and/or filtration and/or abatement of fumes and or odours from uses other than individual residential units, in writing for approval by the local planning authority.

9.50 To satisfy the odour and or fume filtration / extraction condition, it is recommended that an effective and appropriate odour/fume extract system be installed to ensure an odour nuisance is not caused to the occupiers of neighbouring premises. For example for food premises any system will need to deal with the two main phases of contaminants within cooking emissions: the particulate (grease, small food and smoke particles) and gaseous (odour vapour/volatile organic compounds).

9.51 Examples of systems available are as follows:

- an extract system running upwards, either internally or externally with the flue height terminating above roof ridge level to which it is attached by at least one metre. A minimum operating efflux velocity of 10 to 15 metres a second should be achieved. However, the effectiveness of this system is dependent on buildings nearby. If buildings nearby are likely to have an effect on the dispersion and dilution of odour, the flue height should be at least one metre above the ridge of that building.
- If an appropriate height cannot be achieved, a high efficiency odour abatement measure should be incorporated, such as:
    - grease filters with pre-filter particulate filtration (electrostatic precipitator or passive pre-filters) followed by activated carbon filters;
    - grease filters with pre-filter particulate filtration (electrostatic precipitator or passive pre-filters) followed by an odour neutralisation system;
    - a high dilution / high velocity system (HDHV) with a minimum operating efflux velocity of 10 to 15 metres a second.

9.52 This list is by no means exhaustive as there are other similar systems on the market. Each system has its own advantages and disadvantages in terms of cost, physical size, pressure loss, maintenance requirements, odour arrestment effectiveness and associated noise generation.

9.53 It is recommended that flue terminals such as rain cowls / caps do not impede the final discharge termination point.

9.54 Further advice regarding the control of odour from end uses, is contained in the following guidance documents:

- Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (January 2005- Product Code: PB 10527)

produced by Department for Environment, Food and Rural Affairs (DEFRA).

- Protecting our Water, Soil and Air: A Code of Good Agricultural Practice for farmers, growers and land managers, DEFA 2009

- Technical Guidance Note IPPC SRG 6.02 (Farming) "Odour Management at Intensive Livestock Installations", Environment Agency, Guide to Odour Management, May 2005

- Integrated Pollution Prevention and Control (IPPC), DRAFT Horizontal Guidance for Odour Part 2 – Assessment and Control, Technical Guidance Note IPPC H4: October 2002

- BS EN 13725:2003: Air quality. Determination of odour concentration by dynamic olfactometry

POTENTIAL CONTAMINATED LAND

9.55 The actual or possible presence of contamination is a material planning consideration. Persons submitting planning applications are expected to declare any knowledge they may have about potential land contamination. In many cases it will be an advantage to determine whether there are likely to be any contamination issues on site before submitting an application for planning consent. On large-scale developments it could form a part of a pre-application enquiry where any necessary investigations can be determined prior to submitting a planning application.

9.56 On any site where there is the potential for contamination to exist, or the proposed use would be particularly vulnerable to the presence of contamination i.e. residential, a contamination assessment, also known as a Phase 1 Desk Study Investigation, should be submitted as part of the application. An essential part of any Phase 1 Investigation is a site walkover to establish current land use as well as a review of historical land uses to identify potential sources and receptors. The Phase 1 Investigation should produce a 'Conceptual Site Model' and Preliminary Risk Assessment that characterises all plausible pollutant linkages. This will form the basis of any subsequent work undertaken as part of a Phase 2 Intrusive Investigation.

9.57 On review of the information submitted as part of the application, the Council may attach a condition to the application requiring a Phase 2 Intrusive Investigation of the site followed by, if necessary, remediation and validation. A Phase 2 Site Investigation should determine the nature, extent and severity of contamination by means of intrusive investigations. The Site Investigation Report should include borehole/trial pit logs, sample locations and copies of all laboratory analyses. It should provide an updated Conceptual Site Model and details of remedial options.

9.58 The site investigation procedure involves specialist technical knowledge and it is essential that competent and experienced professionals conduct all phases of the site investigation. Health and Environmental Services and Development Control will work together to ensure that the application sites are appropriately investigated, managed and, if applicable, remediated. It is ultimately the developer's responsibility to ensure that the site is suitable for its proposed use.

9.59 The primary aims are to avoid or mitigate risks to human health and the environment to ensure that the proposed development will be suitable for use.

9.60 Further detailed guidance is provided in Appendix 5 to this document

FOOD HEALTH AND SAFETY

9.61 Food safety and health & safety principles are traditionally not part of the formal planning process. This has led to some poor design of commercial premises design, which has required improvement once the workplace is operational. Early consultation with the Environmental Health should avoid the need for costly remedial work; the Service runs a monthly surgery where businesses can attend to discuss plans with an Environmental Health Officer. Surgeries are run on the last Thursday of each month.

9.62 The appropriate design and construction of premises and equipment help food businesses maintain and manage high standards of food safety. Regulations EC No 178/2002, 852/2004 and the Food Hygiene (England) Regulations 2006 require food premises to meet certain standards; covering layout, design, construction, equipment and facilities.

9.63 All persons managing commercial premises as a workplace have a general duty to ensure the health safety and welfare of employers, members of the public and persons affected by the business. Integral to this is design, choice of building fabric, organisation of the workplace and specification of workplace features such as flooring. Environmental Health Officers apply the Construction (Design & Management) Regulations 2007 in some developments for early, proactive intervention on design issues. Advice on this aspect can be sought by contacting Health & Environmental Services and raising your queries with an officer.

9.64 Further detailed guidance is provided in the Appendix 8 to this document

LIGHT POLLUTION

9.65 In a predominantly rural environment such as South Cambridgeshire, the impact of lighting associated with development can have an adverse impact upon both the surrounding landscape and residents of surrounding

properties. In certain circumstances lighting is critical in terms of public safety and security but in others, the amount of light emitted only serves to create a form of pollution either through windows of bedrooms. In such cases, the District Council will seek to reduce the amount of pollution, particularly in the context of new development where lighting is required for the road system or security lighting for remote developments.

9.66 Therefore it is necessary to try to find a balance between the need for lighting and the negative implications associated with it. Lighting in itself may not need planning permission but the Council will use planning powers where appropriate to manage the effects of lighting to achieve the objective of this part of the SPD which is to reduce excessive, intrusive and unnecessary lighting in both rural and urban areas.

9.67 Problems of glare, (the uncomfortable brightness of a light source when viewed against a dark background), and light trespass, (the spilling of light beyond the boundary of the property on which the source is located), are other forms of light pollution. Such light pollution is a waste of electricity and therefore increases energy consumption and emissions.

9.68 Designers are advised to have regard to the type of location in designing lighting proposals and devising techniques for limiting light pollution and its impacts.

9.69 Policy NE/14 requires that development proposals which include external lighting should ensure that:

a. The proposed lighting scheme is the minimum required for reasons of public safety and security;
b. There is no light spillage above the horizontal;
c. There is no unacceptable adverse impact on neighbouring or nearby properties or on the surrounding countryside;
d. There is no dazzling or distraction to road users including cyclists, equestrians and pedestrians;
e. Road and footway lighting meets the District and County Councils' adopted standards.

9.70 Further guidance and policies are contained within Appendix 7.

LITTER AND DOG BINS

9.71 The provision of litterbins and dog bins is entirely functional but can have a considerable impact on the appearance of the street or location. SCDC has therefore adopted a standard design, colour and specification for all litter and dog bins. In future large developments consideration will be given to the provision of litter bins that facilitate recycling of segregated litter. The assumption that the provision of litterbins will prevent littering is not always

right. The provision of litterbins is not linked to resident or property numbers but the local land use, e.g. a parade of shops or the route from a school to the nearest sweet shop is likely to benefit from a litterbin rather than a normal residential street.

9.72 This council has also decided to provide and install all bins to ensure the appropriate standard and method of fixing. This provides better continuity of / and the service as control is lost once a developer has moved on.

9.73 Problems encountered:

- Poor design.
- Poor siting / location – obstructions, spoiling views etc.
- Embellishments drawing too much attention to bins.
- Servicing arrangements / problems.

Guidelines

9.74 The Environment Operations section of SCDC should be consulted at the earliest opportunity to seek advice and guidance regarding all proposals to provide litter and / or dog bins.

9.75 Provision of dog bins in areas adjacent to where children are allowed to play is not encouraged in order to minimise the risk to Toxocara Canis infection: a common worm infection in dogs. Infective stages of this parasite can be found in the environment - particularly in areas frequented by large numbers of dogs - kennels, public parks and exercise areas. Children can be infected by picking up the disease from the environment or from handling dogs.

9.76 All bins located on land other than public highway (as defined by the Highways Act, 1980) will not be emptied by SCDC unless the developer or landowner pays for this service. Consideration should therefore be given how the bins are serviced once provided.

Types

9.77 The Council's standard is the Glasdon Topsey twist-lock in dark green with the Council logo, stubber plate and fire retard for litter and the Glasdon 55 litre Retriever for dog waste.

DRAINAGE AND FLOODING

9.78 SCDC has adopted an integrated approach to water cycle management that aims to manage all of the components of the water cycle (rainwater, stormwater, sewage, ground water, surface water and recycled water) to secure a range of social, economic and environmental benefits.

9.79 There is a policy commitment to minimising flood risk, managing surface water and achieving sustainable drainage principles in new and existing development whilst ensuring that the re-use and recycling of water is given priority. This approach is in line with Planning Policy Statement (PPS) 25: Development and Flood Risk (2006) that emphasises, “all forms of flooding and their impact on the natural and built environment are material considerations”.

9.80 Notwithstanding PPS 25 there are additional requirements that may fall on developers in connection with the South Cambs Awarded Watercourses system.

9.81 The Council is responsible for the maintenance of approximately 280 km of awarded watercourses at a variety of locations within the SCDC area. The watercourses are controlled using the Land Drainage Act 1991 and the Council's Land Drainage Byelaws. Copies of the Byelaws and information on the location of the awards are available from the Council's Drainage Manager.

9.82 Any works in the vicinity of the award drains will require careful consideration and may require consent under the terms of the Byelaws. In particular, the Byelaws designate a 5-metre maintenance strip, along both sides of the awards, that must remain clear at all times. Additionally, any proposal to increase the rate of flow or volume in an awarded watercourse will require the prior consent of the Council. Developers should be aware that, under certain circumstances, a contribution to the cost of the award drain maintenance may be required by the Council.

HEALTH IMPACT ASSESSMENTS

9.83 Policy DP/1 Sustainable Development of the LDF requires a Sustainability Statement and a Health Impact Assessment for all major developments, to be submitted with the application demonstrating that the principles of sustainable development have been applied.

Health Impact Assessment – Policy Context and Purpose of HIA’s

9.84 New communities and developments should be planned and designed at the beginning of the process to take full advantage of the opportunities to improve the health of local people and to reduce health inequalities.

Health Impact Assessment - Background

9.85 Spatial planning and development has the potential to impact on human health and wellbeing. This is because a wide range of social and environmental factors affects the health of local communities within South

Cambridgeshire. These are known as the "Wider Determinants of health" and include:

- Individual lifestyle factors such as smoking habits, diet and physical activity.
- Interactions with friends, relatives and mutual support within a community.
- Wider influences on health including:- living and working conditions, unemployment, water and sanitation, health care service, housing, food supplies, education, and the work environment.

9.86 Ensuring these issues are considered at the planning and design stage can improve both the physical and mental health of the population. Guidance expressed within this Design Guide SPD can contribute to sustainable planning, good design and the development of community resources. These can encourage environments which: increase people's sense of safety and wellbeing, their opportunities for social interaction and community connectivity, improve air quality and water conservation and promote active travel and physical activity.

9.87 It is important to consider the effects of the wider determinants of health on not only the physical environment (e.g. air pollution, traffic patterns, housing stock) but also the social environment, which refers broadly to the social norms and values shared by members of social groups, as well as the quality, content, and volume of interpersonal interactions within urban and rural and between urban and rural communities. It is also known that these wider determinants are not distributed equally among populations (e.g. those people living in areas of deprivation tend to have poorer health outcomes). By considering these effects and their distribution, development policies and plans can enhance the potential to influence health and wellbeing, and health inequalities.

Health Impact Assessment – Aims and Objectives

9.88 Health Impact Assessment should:

- Appraise the potential positive and negative health and well-being impacts of the proposed development on planned new communities and the adjacent existing communities in the development area.
- Highlight any potential differential distribution effects of health impacts among groups within the population by asking 'who is affected?' for the impacts identified.
- Suggest actions/mitigations that aim to minimise any potential negative health impacts and maximise potential positive health impacts, referencing where possible the most affected vulnerable groups.

Building Healthy Communities

9.89 In addition to Health Impact Assessments, which look at the impacts the development will/may have on health, it is also important to examine in detail how the proposed development is going to ensure that the new community is a vibrant and healthy one. Building new houses and shops does not build communities. Infrastructure within new communities will need to be more than the roads connecting the built environment; it has to include the social infrastructure as well. The social infrastructure will include, but is not limited to, the opportunities to meet neighbours, to get information and to take part in running the local organisations and councils.

To assist in the preparation of a Health Impact Assessment, further guidance will be provided in an additional Supplementary Planning Document to be published in 2010

CHAPTER 10

BUILDING REGULATIONS AND DISABILITY DISCRIMINATION ACT

BUILDING REGULATIONS

10.1 Building Regulations were originally created to ensure the health and safety of people in and around buildings and more recently to provide accessible and thermally efficient buildings.

10.2 South Cambridgeshire District Council's Building Control section provides advice and guidance on Building Regulations and works closely with the Council's own Planning, Design and Conservation sections wherever there is an impact on design and the historic environment. The applicants and Building Control consultants who are not currently part of the Council's own Building Control team are encouraged to work with the Council at an early stage to identify any issues, provide a flexible and informed design that protects the interests of the context and to ensure that the works comply with Council standards.

10.3 Those works that affect buildings in a Conservation Area or buildings identified as being of architectural and historical interest would need to be discussed with the Conservation Section. Early consultation is encouraged in order to identify if any element is unacceptable and to negotiate any alternatives in conjunction with the Building Control section. English Heritage's guidance, Building Regulations and Historic Buildings, 2004 provides advice for work to any buildings of Historic interest.

10.4 The Council's Listed Buildings SPD provides specific guidance for the application of Building Regulations to work with Listed Buildings.

10.5 The Dorset Model is an accepted alternative method of compliance for Part B for thatched roofs but needs consultation with the Fire Authority and neighbours.

DISABILITY DISCRIMINATION ACT

10.6 The Disability Discrimination Act (DDA) was introduced in 1995 and updated in 2005. It aims to allow equal access to services for all. The Act requires the provision to be reasonable, and the level of reasonable accessibility will therefore vary according to the limits of the specific building and the uses involved.

10.7 For new buildings, commercial buildings and buildings open to the public, it is expected that at least primary functions are accessible to all. Where the most accessible option is potentially damaging to a Listed building, other

provision such as alternative facilities and a Management Plan may be reasonable.

10.8 Part M of the Building Regulations provides practical guidelines for the implementation of elements of the DDA. Access Audits / Statements and Management Plans are encouraged for any works that form part of Part M or the DDA. British Standard 8300 provides additional guidance on the requirements.

10.9 English Heritage's guidance, Easy Access to Historic Buildings, 1999 provides advice for application of the DDA to any buildings of Historic interest.

10.10 Access Audits / Statements and Management Plans are encouraged for any works that form part of Part M or the DDA. British Standard 8300 provides additional guidance on the requirements under Part M.

CHAPTER 11

SUSTAINABLE DEVELOPMENT

ENVIRONMENTALLY SUSTAINABLE DESIGN AND CONSTRUCTION

11.1 Elements of the built environment are designed and constructed at any one time to meet a set of specific needs. These needs will focus upon occupational requirements, with space, amenity and access functions designed around them. These requirements are generally immediate, i.e. 'we need this building here and now because…'.

11.2 Environmental sustainability demands that these requirements are placed within a wider context. One that encompasses more than the present needs of the initial occupier. As the pressures of population, household numbers and conventional economic growth continue, so to do the pressures upon land, natural resources, energy and water supply and waste management: meaning that the cumulative impact of development becomes greater. This impact builds in a way which is not always apparent or immediately relevant to the developers of a single site and is likely, where recognised, to be traded off against what seem more immediate and relevant matters. This gap between the individual benefit and the long term broader social, and even global, benefit is where the parameters of sustainable design and construction step in to unite the two. Sustainable design and construction recognises that underlying the ebb and flow of social and commercial activity driving our everyday lives that there is an imperative to look after the environmental capital upon which this socio-economic activity is essentially built. Compromise the environment in a world where natural resources are stretched up to and beyond their capacity to last indefinitely, and the social and economic activities that define our way of life will contract, decline or collapse. The 2006 Stern Report made it clear that steps taken today to mitigate climate change will be far more cost effective than trying to manage unmitigated consequences in the future.

11.3 The purpose of this Sustainable Development section of the Design Guide is therefore to ensure that the development of our built environment, from the extensive growth areas to the single home extension, actively incorporate measures that will not undermine the local and global environment for the wider use of present and future generations.

11.4 It is important to remember that sustainable design and construction in itself does not have to follow any particular 'look' or 'style' and often does not necessarily need to be more costly or complicated than more traditional means. As an approach it should therefore be sufficiently flexible to accommodate the other design criteria, parameters and guidance presented throughout this document.

SUSTAINABLE URBAN DRAINAGE SYSTEMS

11.5 Conventional drainage systems that pipe surface water run off away from hard paved areas, can cause problems elsewhere, especially following periods of intense, or prolonged rain. Opportunities to incorporate Sustainable Drainage Systems (SUDS) into the design of external areas should be explored. SUDS comprise a range of techniques that allow surface water to be managed in a more natural manner as close to its origin as possible, through the use of permeable surface treatments, filter strips and swales and basins and ponds. As well as helping to lessen the risk from flooding, such techniques can also offer benefits in terms of pollution control (through improved filtration), habitat creation and visual amenity.

11.6 Where basins and ponds are to be incorporated, they should be designed to appear as natural as possible, with contours designed to blend into the landscape, and with different margin depths and shelves to maximise opportunities for the enhancement of biodiversity.

POLICY CRITERIA

11.7 South Cambridgeshire's planning policy direction, as expressed through the LDF, is very clear as to the environmental sustainability criteria that it expects applicants for planning permission to take account of within their proposals:

- Minimise the use of energy and resources.
- Reduce carbon emissions.
- Maximise the use of renewable energy sources.
- Incorporate water conservation measures.
- Use sustainable drainage systems.
- Adaptation to the impacts of climate change.
- Use sustainable building methods and materials.
- Recycle construction waste.

11.8 The above policy criteria will raise a series of questions in the minds of applicants as they draft or assess their proposals. Appendix x [to follow] provides a list of such policy-derived questions. This may make a useful checklist for applicants at the pre-application stage.

11.9 The following text has been designed to support applicants when considering their answers to these questions.

ENVIRONMENTALLY SUSTAINABLE DESIGN AND CHOICE

11.10 In taking account of each of the above policy criteria during the design process various choices will have to be made. These relate to:

- Layout and orientation.

- Building form and structure.
- Technology availability and suitability.
- Occupancy behaviour.

11.11 The choices made will either enlarge, reduce or contain the ecological and carbon footprints of any proposed development. It is therefore crucial that each is dealt with transparently so that the reasoning behind each choice is clear for all to see.

11.12 The sustainability elements of this Design Guide will inevitably have an impact upon the more physical and tangible elements of layout, orientation, building form and structure. Managing the use of energy and resources, meeting carbon reduction targets and adapting to climate change will, however, extend beyond installation on the ground. The majority of measures will quite likely bring future residents and occupants into contact with some degree of unfamiliar technology, equipment, operation and maintenance. Unless the rationale and benefits behind such measures are specifically introduced to and understood by those that will be living with, using and maintaining them, then their full potential will almost certainly be compromised. As a matter of good practice therefore, all applicants should look to ensure that fully accessible user guidance and technical information is directly passed on to future occupants so that they are able to make the very most of all the sustainable design and construction features included within the new development.

ESSENTIAL CONSIDERATIONS AND OPTIONS

11.13 The following sections are intended to provide guidance on fulfilling the Local Planning Authority's policies as they relate to sustainable design and construction an as presented within the Development Control Policies DPD of the South Cambridgeshire LDF, alongside subsequent drivers such as the Planning Policy Statement 1 Climate Change Supplement and issues around behaviour and occupier engagement. All policies should be taken account of and if a compromise is proposed then it should be fully validated – cost on its own is not grounds for compromise.

11.14 Sustainable design and construction is a tremendously creative, expanding and developing field. Guides such as these are very readily overtaken by events and technical advances. The advice and guidance offered should therefore be seen as a flexible framework. A framework in which there is room for creativity, new approaches and the finer details (that only come from thorough site appraisal) in meeting the Authority's adopted policies.

11.15 'Major development' (over 1,000m^2 or 10 dwellings) applications require the submission of a Sustainability Statement to demonstrate how the sustainability criteria have been fulfilled (alongside the submission of a Water Conservation Strategy and a Resource Re-use and Recycling Scheme).

11.16 In considering each of the following elements it is important to remember that they do not stand alone from each other. They all contribute to the integrated design of a whole project – from the ground up and from 'cradle to grave' every element has an effect on every other. This complexity means that it is very difficult to set out a definitive approach. In tying together location, orientation, structure, infrastructure, adaptability, construction and materials so some degree of trade-off is inevitable. There is no exact science to help, but what is essential is that any compromises are clearly described and the decision-making process succinctly explained.

SITE APPRAISAL

11.17 There remains a prevalence amongst developers, architects and builders to view environmental sustainability options as post hoc 'bolt-ons' to site and building design. This frequently means that new development is unable to take full advantage of its site's potential, especially in terms of layout and orientation to best facilitate sustainable energy and resource use (e.g. solar gain, shading, drainage, access etc.). Therefore, in order to make the most of a site it is necessary to get a full understanding of its opportunities and constraints from this perspective. In a nutshell, an effective site appraisal should ensure that:

- Sustainability proposals are working with a site rather than being imposed upon it;
- The opportunity to develop the best site-specific solution is more likely to be realised, and
- Environmental sustainability lies at the heart of a site's functionality.

11.18 The extent of such an appraisal would depend upon the size of the development – a small application, such as a home extension, would only require a brief statement and/or annotated plans.

11.19 The principal environmental sustainability issues to be covered by the site appraisal would include:

- Movement and accessibility.
- Water and biodiversity.
- Sunlight.
- Wind speed and direction.
- Microclimate, soil, drainage and water table.
- Existing buildings and potential for re-use.
- Levels of atmospheric and noise pollution.
- The potential for a combined heat and power scheme.
- Site stability and contamination.

11.20 The above should be set alongside more conventional issues such as the character of the area, historic interest and building features.

11.21 The importance of establishing the site's intrinsic sustainability potential is an invaluable first step in meeting the Authority's policy requirements in the most effective and economically viable way possible. At the end of the appraisal process, detailed information should be held on previous use, layout, building orientation, solar energy potential, vegetation, wind energy potential, landscaping, movement and transport, and water.

Minimise the Use of Energy and Resources

11.22 Desired outcome: consideration of this over-arching criteria at the outset of the design process is crucial to realising the full environmental sustainability potential of any proposed development. A comprehensive review of the environmental implications and interrelationships of design choices relating to layout and orientation, building form and structure, materials, adaptation to future conditions and occupancy behaviour should be carried out in the round. The integral and systemic nature of many measures to minimise the use of energy and resources make it hard to over-emphasise the importance of including these issues within the early feasibility stages of examining alternative design and construction approaches and cost implications.

11.23 Principles: The concept of 'one-planet living' is useful in understanding the goals of environmental sustainability. However, when it comes to developing the working principles for development proposals its relevance fades as the need for realistic quantification in assessment and accounting processes comes to the fore.

11.24 It is more useful to breakdown the energy and resource flows that are likely to emanate from proposals and then understand how they can be worked up within the new development in such a way that they will contribute to closing the energy and resource 'loops' of which they are inseparably a part of. On-site renewable energy generation, rainwater harvesting, grey-water recycling, passive solar gain, natural ventilation, use of thermal mass, composting and space for growing food are all examples of measures which can subsequently minimise energy and resource use through employing thoughtful, creative and innovative approaches to design and construction.

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11.25 Essential requirements: all schemes, whatever their size, will benefit from the inclusion of a sustainability statement, or similar document, that clearly illustrates the environmental sustainability choices that have been made in relation to the development's: orientation and layout; building form and structure; materials to be used; ability to adapt to future conditions, and; the behaviour of the envisaged occupants.

11.26 Delivery options: there are a range of baseline assessment tools available that will facilitate the bringing forward of environmental sustainability choices, from carbon and ecological foot-printing to baseline energy analysis, formal pre-construction assessments and comprehensive checklists.

11.27 An example of such a checklist is included in Appendix x. [to follow]

Reduce Carbon Dioxide Emissions

11.28 Desired outcome: new development, specifically where it does not replace previous development, will in almost every case increase carbon dioxide concentrations in the atmosphere: attracting new emission sources through the running of building services, transport to and from, and the consumption patterns of its occupants. Sensitive, yet practical design, can have a tremendous influence upon reducing these emissions through measures that reduce demand and improve the efficiency of heat and power usage. Applicants should demonstrate how their proposals will maximise the incorporation of energy conservation and efficiency measures – aiming for a minimum 10% reduction in CO_2/m^2/year compared to the current (2006) Building Regulations. Specified levels for carbon reduction are increasingly being tied to the Code for Sustainable Homes (to be extended to cover other premises through the Code for Sustainable Buildings). All new dwellings will be expected to achieve a 25% reduction in CO_2 emissions over the 2006 Building Regulations by 2010, 44% by 2013 and achieve a zero carbon emissions figure by 2016 (for other buildings this is likely to be 2019). The development and implementation of the Code for Sustainable Homes (/Buildings) is unifying the standards for sustainable design and construction and the technical guidance available will increasingly prove a useful reference document. Applicants are encouraged to realise as high a level of the Code as possible.

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11.29 Principles: by far the greatest release of carbon emissions into the atmosphere is tied to energy generation from fossil fuels (other relevant sources that may need to considered include some specific chemical processes, land use change and influences upon certain 'natural' processes). For the purposes of this guide the overriding principle is to apply sustainable design and construction techniques to significantly reduce, and where possible break, the functional link between the needs of a building and its use of fossil fuels to meet those needs.

11.30 Essential requirements: this reduction and disconnection in the use of fossil fuels will require that all new developments, renovations and extensions make assessments of building, transport and occupancy energy needs.

Such assessments should take the form of a tabulated calculation covering each potential energy use for residential and/or non-residential purposes – showing the baseline figures and the figures that will be achieved after the proposed energy conservation/efficiency measures have been applied.

11.31 Energy consumption for the proposals should be calculated using SAP or SBEM methodologies (for non-regulated domestic-type uses BREDEM-12 should be used). Calculations should include all end uses/private infrastructure (e.g. communal areas and car parks lighting/heating) and process loads. All energy values should be converted using the carbon emission factors set out in the current version of the Building Regulations. Alternatively the benchmarks set out in the London Renewable Toolkit may be used (converted into $kgCO_2/year/m^2$).

11.32 Delivery options: the importance of determining the optimum layout, orientation and overall landscape parameters to improve the energy conservation and efficiency functions of a development cannot be overstated (the implications for maximising sustainable energy generation will also be a part of this process).

11.33 Energy efficiency in design is tied to identifying natural orientation factors (e,g, topography and tree cover) to harness solar gain and associated benefits such as thermal mass (balancing day and night heat storage) and natural day-lighting. The design will also need to incorporate passive shading features to curtail summertime over-heating.

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11.34 Designing to conserve heat is the other parallel consideration through good insulation, attention to window size and placement, draught management and ventilation. Examples of how these issue can be taken to fully integrated delivery can be found in “Passive House” standards where conservation and efficiency measure are taken sufficiently seriously that a conventional central heating system is no longer required. Low energy lighting and appliances, alongside the use of energy management systems, are all other important measures that should be taken account of when developing proposals.

Maximise the Use of Renewable Energy Sources

11.35 Desired outcome: the incorporation of renewable energy sources within building designs permits the further reduction of carbon emissions beyond that which can be achieved by conservation and efficiency measures alone.

11.36 Serious consideration should also be given to the potential of exporting excess or supplementary heat and power to either the national grid or

nearby properties as a means of increasing viability and allowing the development to offset other related carbon emissions (e.g. transport) or become a site of net carbon reduction. These opportunities are only likely to become more accessible as less flexible means of remuneration are superseded or supplemented by schemes such as 'feed-in tariffs' and 'renewable heat incentives'.

11.37 Principles: in order to save unnecessary cost and capacity in renewable energy installations it is essential that all of a development's potential energy conservation and efficiency measures have been utilised.

11.38 A careful and rigorous assessment procedure will need to be carried out early in the design process in order to determine the effective technology, or mix of technologies, that can be incorporated within the development site to meet as great a proportion as possible of heating, cooling and electricity needs.

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11.39 In terms of carbon reduction, it is important to recognise that carbon emission factors vary depending upon the fossil fuel source that is being replaced – for example the current Building Regulations (2006) state that a kWh of electricity accounts for the emission of 0.42kg of CO_2, whereas a kWh of gas accounts for 0.19kg of CO_2. These emission factors also highlight the differences between heat (e.g. for space and water) and power (e.g. to run electrical appliances) and why it is therefore so important to use $kgCO_2/year/m^2$ as opposed to $kWh/year/m^2$ when assessing carbon reduction through energy conservation, efficiency and renewable energy generation measures.

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11.40 Essential requirements: applicants with proposals greater than $1{,}000m^2$ or 10 dwellings ('major developments') will be expected to ensure that 10% of their predicted energy requirements are met through the inclusion of on-site renewable energy technologies. This requirement should be calculated in $kgCO_2$ not kWh for the reasons outlined above.

11.41 In order to bring forward the most appropriate renewable energy solutions for such a development, applicants should include (at the outline submission stage) a feasibility assessment of the options that have been considered. This assessment, when combined with baseline data on predicted energy use, target emissions and measures to improve conservation and efficiency (re. previous sections) will comprise the Energy Statement that must accompany the application.

11.42 For major developments, applicants are strongly encouraged to consider options for site-wide solutions as early as possible in the development process. Such options have the potential to deliver major cost, energy and carbon savings but will almost certainly need to be integrated within development plans from the outset.

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11.43 Delivery options: in considering their feasibility assessment it can be useful to present the options in a hierarchy of suitability and viability. Selection of the most appropriate technology, or mix of technologies, is at the applicants discretion with the following as a guiding list of those that may be considered:

- solar thermal hot water systems
- solar photo voltaic (PV) cells/panels
- ground, air or water source heat pumps
- wind turbines
- geothermal
- biomass (boilers, stoves and combined heat and power)
- anaerobic digestion

11.44 Should the applicant have any queries regarding suitability then they should contact the Council's Strategic Sustainability Officer in advance of submission.

11.45 The delivery scale of all the above technologies may in theory be varied to lesser or greater extents for different scales of development from single buildings to community or district schemes: bringing varying benefits in terms of cost per unit and user interaction.

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11.46 Currently biomass, anaerobic digestion and geothermal technologies have the greatest potential to be scaled up to provide district/community level heating schemes. Typically within the UK, the former two are also used to generate electricity. When used for both applications they are known as combined heat and power (CHP) systems (they may even incorporate a cooling function and are then known as CCHP systems). Scaling up to the district/community level can greatly improve the viability of multi-unit development schemes seeking to achieve the higher levels of carbon reduction (50% plus).

11.47 Clearly if a CHP system uses fossil fuels it cannot be regarded as renewably powered. It can however, with the correct infrastructure, still bring significant carbon savings through cutting electricity transmission losses and using 'waste' heat. If applicants are considering such an approach, they should contact the Strategic Sustainability Officer as early as possible in the application process to discuss their proposals in relation to the Authority's renewable energy policies.

Incorporate Water Conservation Measures

11.48 Desired outcome: alongside energy, responding to the sustainable supply and use of water within the design and construction process is almost certainly the most pressing resource management issue that new development must tackle and lead on. This is especially the case in the East of England where rainfall is the lowest in the country (South Cambridgeshire averages less than 50mm per month). As with energy, consumption has increased dramatically in recent decades. At the domestic scale, each of us now averages a daily consumption in excess of 150litres of water – almost all of which is delivered to premises as a drinking standard (with not insignificant carbon emission implications) even though the vast majority is used for washing, toilet flushing and watering the garden.

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11.49 Again as with energy, new development will, unless very tightly accounted for, increase in gross water resource usage. Reducing 'mains' water consumption is thus considered a priority outcome in the consideration of planning applications.

11.50 The importance of reducing consumption is recognised within the Code for Sustainable Homes where water usage is set as a mandatory standard for Levels 1 and 2 at 120 ltrs/person/day, Levels 3 and 4 at 105ltrs/person/day, and Levels 5 and 6 at 80 ltrs/person/day.

11.51 Principles: As with most sustainable resource management issues, the design principles for reducing water usage are held within a hierarchical framework. The first level, as always, involves reducing need or demand for water in domestic, business and industrial activities attached to the development. The second level is to intercept and use rainwater before returning it to mains, or ideally a sustainable, drainage system. The third level involves a more concerted interception of water already used within a residential or commercial process for a lower grade use such as waste removal (e.g. toilet flushing) or municipal or domestic irrigation.

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11.52 For the hierarchy to generate maximum and lasting returns, the behaviour of the building occupants will play a vital role. As with energy, applicants should take specific steps to raise awareness of the problem of profligate water consumption and the importance of personal responsibility in minimising waste and improving efficiency in use.

11.53 Essential requirements: planning policy within South Cambridgeshire requires that new development incorporate all practicable water conservation measures and that for major development (over 1,000m^2 or 10 dwellings) a Water Conservation Strategy be submitted to demonstrate how such measures will be brought forward and implemented.

11.54 For larger developments, the interception of surface water run-off for domestic or commercial purposes may have implications for local water courses and water tables. In such instances a careful balance must be struck between rainwater harvesting and the release to surface run-off.

11.55 Delivery options: behaviour change and the reshaping of commercial processes to bring down demand is clearly a crucial element of water conservation. Thoughtful design may be used to encourage this change. For example, through incorporating smaller baths and the more accessible location of water meters (along with home information packs or building user guides) or use of sub-metering to enable effective water management by the occupants.

11.56 Other more technical responses to maximise water efficiency should be specified as a matter of course, e.g. aerated taps and shower heads, low flush toilets and water efficient appliances. Basic rainwater harvesting using water butts should also be included as a standard where the opportunity exists. For industrial and office units, that often have significant roof areas, rainwater collection should similarly be the norm (where uses can run from commercial processes to toilet flushing). Greywater recycling is a more sophisticated approach and will almost certainly be required for level 5 and 6 of the Code for Sustainable Homes (where the standard required is 80 litres/person/day). Community scale schemes are now coming forward and have the very real potential to enhance financial viability for multi-user developments.

Use Sustainable Drainage Systems

11.57 Desired outcome: the essential purpose of a sustainable drainage system (SuDS) is to manage the precipitation falling upon a development in such a way that it mimics the natural drainage of the undeveloped site.

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11.58 SuDS offer a more environmentally, socially and frequently economically sustainable alternative to conventional underground piped systems with street level grates or storm drains.

11.59 High quality SuDS can reduce flood risk, provide community amenity value (e.g. ponds) and promote biodiversity through the creation of new or improved wildlife habitats.

11.60 Principles: a well designed SuDS will consist of a series of infiltrating water transport features known as the 'management train'. This promotes evaporation and infiltration as close to the point of precipitation as possible, with the balance being progressively cleaned/filtered in its journey to the nearest water course.

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11.61 Essential requirements: the extent of a SuDS scheme will depend upon the size of the proposed development and the extent of open space available. Even in the smallest development, however, valuable elements and features should be considered for incorporation. Good quality SuDs will require careful design consideration to ensure that they are straightforward to maintain whilst, primarily, ensuring that the scheme satisfactorily fulfils its drainage role and, secondarily, maximises its landscape, amenity and biodiversity value. The Authority will be fully supportive of such schemes.

11.62 Long term adoption of larger schemes, extending beyond private property boundaries and into public open space, will be an important issue. In such cases, applicants should discuss appropriate arrangements with the Authority.

11.63 Delivery options: the management train diagram above illustrates some of the elements that applicants may seek to include within a SuDS scheme. The scale of the development and inclusion of roads will be important factors in the design of delivery options.

11.64 Smaller scale schemes within the boundaries of private property could include: green roofs, permeable driveways and parking, soakaways, proprietary treatment systems, and, geocellular storage (preferably combined with rainwater harvesting).

11.65 SuDS in road transport corridors could include: filter strips, swales, rain gardens (bioretention), filter drains, and, canals and rills.

11.66 Larger scale SuDS incorporating significant open space could include any of the above plus ponds and wetland, and infiltration and retention basins.

11.67 Applicants developing SuDS should be aware that certain conventional landscape design and planting practices may require modification to facilitate an effective management train, account for different soil/moisture profiles, reduce soil erosion, and promote nature conservation. Access to an appropriate degree of SuDS engineering expertise will be an important issue for applicants – especially for larger schemes.

Mitigate Against the Impacts of Climate Change

11.68 Desired outcome: there is scientific consensus that human induced climate change is almost certainly upon us today. Limiting the impact, by reducing emissions, is a priority issue. Adapting to the level of climate change to which we are already committed is also a matter of great importance and one in which sustainable design and construction stands to play a prolific role. Although some uncertainty remains as regards precise timings and the upper and lower levels of impact, there is agreement that we should expect greater seasonality with less stable weather patterns bringing more extreme weather events as long-term changes in climatic conditions begin make themselves felt. All new development should therefore be proactively designed to mitigate against such impacts, which include:

- Increasing risk of heatwaves and extreme temperatures.
- Wetter winters, more intense downpours and drier summers (increasing seasonality).
- Greater risk of drought and flood.
- Higher potential for more intense and frequent storms.

11.69 The outcome should be a design process that ensures that development takes account of the expected changes over its envisaged lifetime or be readily capable of adaptation without compromising carbon reduction measures (e.g. avoiding the use of fossil-fuelled cooling equipment).

11.70 Principles: the longevity of the built environment renders adaptation a current rather than future issue. The driving principle is of designing in the capacity for resilience to the impacts of future climate change. This designing-in should seek to ensure that occupants do not become dependant on the high use or retrofitting of costly and resource intensive building services to maintain their wellbeing – e.g. cooling and water supply in the case of heatwaves and drought respectively. Thoughtful adaptation strategies will deliver multiple benefits: enhanced liveability and quality of life in communities of the future, protection of investment, reduced insurance costs and enhanced biodiversity.

11.71 Essential requirements: in order to satisfactorily fulfil the Council's policy on mitigating against the impacts of climate change within new development, applicants should demonstrate that their proposals deliver built-in resilience to such impacts: high temperatures, storm/flood risk (including strong winds), water stress, and earth movement in areas of subsidence risk.

11.72 Delivery options: the scale of a proposed development will influence the extent of the delivery options available to applicants. Designing for larger developments will permit the inclusion of a more comprehensive cascade of measures. For most scales, however, the options available generally share a similar approach.

11.73 Managing high temperatures:

- Promotion of evaporative cooling through the use of green open space, water bodies and features (e.g. SuDS).
- Provision of shading, to reduce excessive solar gain, through street and building orientation and structural features along with planting.
- Careful and creative design to maximise passive ventilation potential.
- Use of cool building materials, reflective surfaces and green roofs and walls to curtail heat penetration.
- Inclusion of thermal storage or mass – absorbing heat during hot periods which can be dissipated when it is cooler (ground coupled systems make use of sub-surface storage).

11.74 Managing flood risk:

- Effective land management, SuDS features and planting to reduce the rate of surface run-off.
- Widening drains and drainage features.
- Removing pinch-points in flood pathways.
- Raising water sensitive services and equipment beyond potential flood-line.
- Use of specific flood resilient materials and building features.
- Managing water availability and quality risks.
- Collect and store rainwater (harvesting from roofs and SuDS).
- Incorporation of rainwater recycling.
- use of drought-resistant planting (xeriscaping).
- Installation of water efficient fixtures, fittings and appliances.
- Managing ground conditions.
- In areas of high risk take expert advice over structural reinforcing and retaining options.

Use Sustainable Building Methods and Material

11.75 Desired outcome: the use of sustainable building methods and materials is an area of huge creative expertise within design and construction. One that stands to significantly reduce the negative natural resource, energy and carbon emission implications of the building process. From the climate change perspective, conventional methods of construction and materials used will 'embody' within them a relatively high amount of fossil-fuel derived energy – the carbon emitted in the production of building materials and their bringing together in the completed building. Approximately 10% of national energy consumption is used in the production and transport of construction products and materials.

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11.76 Sustainable building methods and materials should be used to bring down this embodied figure whilst also sustaining the source of natural materials used without degrading habitats and the long-term wellbeing of indigenous populations (e.g. timber and aggregates).

11.77 Principles: materials such as concrete, UPVC, PVC and extruded polystyrene all require high volumes of energy and resources to make them. These, and others such as alkyd (oil-based) paints and phosphogypsum (used in plasterwork) also generate pollution and toxic compounds – dangerous to ecosystems and human wellbeing. To counter these, and other issues, the principles associated with the use of sustainable building materials should incorporate the following distinct procurement and quantity surveying elements:

- Do not use or waste unnecessary materials.
- Where practicable, source materials that require the minimum energy use in their production.
- Where possible, source materials locally to reduce transportation impacts.
- Source materials that have been ethically harvested, processed or manufactured.
- Carefully monitor the use of materials during the construction process.

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11.78 In terms of construction methods, there is a marked division between those employing 'modern methods of construction' (pre-fabrication of industrially produced materials and partial off-site construction) and those wishing to

utilise natural materials in an expressly ecologically sensitive manner in what is termed 'low impact construction' (these are the 'deep green' buildings typified by projects practised at a small scale and usually in rural areas ideally using locally sourced natural materials with very low embodied energy in their fabric e.g. cob, rammed earth, hemp, straw bale or green timber). Both of these strategies to sustainable construction share an approach founded upon drawing all of the above principles into an integrated design for the whole project.

11.79 Essential requirements: applicants should make an early assessment of their outline proposals in consideration of how they could practically incorporate sustainable building methods with verifiably sustainable materials (including recycled) that have, as far as possible been locally sourced.

11.80 Delivery options: this guide cannot provide comprehensive information on the sustainability of all building materials – other publications such as the BRE Green Guide to Specification are far better placed for this purpose. In making a choice, the applicant will need to find a balance which meets their sustainability priorities. This is an inevitably complex area and one in which the full lifecycle environmental implications of a material (from production to disposal/re-use/recycling) must also be taken account of. It is, however, an area that applicants should look to take account of.

11.81 As a preliminary primer, material specification should, where applicable, actively consider including the use of:

- Certified timber.
- Natural insulation products.
- Natural flooring material.
- Timber framed windows.
- Structural timber frame.
- Timber cladding.
- Natural paints.
- Products with a high recycled content and naturally sourced.

and, excluding the use of:

- Organic solvent based floor finishes, paint, glues, stains and adhesives.
- Energy intensive products (e.g. PVC, aluminium, copper and lead).
- Virgin aggregates.

Recycle Construction Waste

11.82 Desired outcome: approaches to recycling construction waste are closely tied to the use of sustainable building methods and materials as discussed

in the previous section. It is a very significant issue, with construction and demolition waste representing 24% of total UK waste by weight. Development therefore adds significantly to the burden of existing waste that must be managed. Unfortunately a significant proportion of this waste is still disposed of to land fill. The recycling or reuse of this waste should therefore be a priority for all applicants and carefully planned to cover all waste arising during construction.

11.83 Principles: applicants are expected to ensure that their proposals incorporate the principles of the waste management hierarchy. The least preferred option is disposal to landfill and the most preferred option is, through careful design, to negate or reduce the demand for materials that more conventionally, or less thoughtfully, would otherwise have been required.

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11.84 Essential requirements: applicants should prepare a Resource Re-use and Recycling Scheme to cover all waste arising during the proposed construction and/or demolition. Where possible, this should include the appropriate accommodation of construction spoil within the development and maximising the re-use and recycling of any suitable raw materials currently available on site during construction, such as redundant buildings or infrastructure. The Site Waste Management Plans Regulation 2008 places a legal requirement upon applicants to have a Site Waste Management Plan (SWMP) for all new construction projects costing more than £300,000. A SWMP will need to forecast how much of each type of waste will be produced on site and how it will be managed.

11.85 Delivery options: applicants should demonstrate how they are planning to use recycled material, reduce waste and ensure that as much of this is re-used or recycled as possible. Acting upon these objectives will probably require that the site incorporates facilities for waste sorting and recycling alongside procedures to minimise waste and maximise recycling during construction and demolition.

11.86 Buildings should, where possible, be south facing to maximise solar gain to reduce the demand for space heating from fossil fuel sources. Deep span buildings can be difficult to daylight and naturally ventilate.

CODE FOR SUSTAINABLE HOMES

11.87 The design of houses should incorporate current best practice, including the consideration of sustainability issues. The Government has established an environmental performance rating for houses, the Code for Sustainable

Homes, which assesses house types and rates them between 1 and 6, depending upon their performance.

11.88 The principles of sustainable development underpin the strategy, and all policies and proposals of the south Cambridgeshire Local Development Framework. The Council's policies relate to specific issues that are assessed under the Code for Sustainable Homes. Developers are encouraged to exceed the Council's policy requirements, with some house designs achieving the highest rating of carbon neutral status under the Code.

11.89 Developers are required to undertake a design led approach that demonstrates and justifies its appropriateness for the development and its location.

LIFETIME HOMES

11.90 The design of new homes within the District should also seek to incorporate the Joseph Rowntree Foundation's Lifetime Homes standards. The 16 features designed to make homes more flexible and accessible are (see www.jrf.org.uk):

1. Where car parking is adjacent to the home, it should be capable of enlargement to attain 3.3 metres width.
2. The distance from the car-parking space to the home should be kept to a minimum and should be level or gently sloping.
3. The approach to all entrances should be level or gently sloping.
4. All entrances should be illuminated and have level access over the threshold, and the main entrance should be covered.
5. Where homes are reached by a lift, it should be wheelchair accessible.
6. The width of the doorways and hallways should accord with the Access Committee for England's standards.
7. There should be space for the turning of wheelchairs in kitchens, dining areas and sitting rooms and adequate circulation space for wheelchair users elsewhere.
8. The sitting room (or family room) should be at entrance level.
9. In houses of two or more storeys, there should be space on the ground floor that could be used as a convenient bed space.
10. There should be a downstairs toilet that should be wheelchair accessible, with drainage and service provision enabling a shower to be fitted at any time.
11. Walls in bathrooms and toilets should be capable of taking adaptations such as handrails.
12. The design should incorporate provision for a future stairlift and a suitably identified space for potential installation of a house lift

(through-the-floor lift) from the ground floor to the first floor, for example to a bedroom next to the bathroom.

13. The bath/bedroom ceiling should be strong enough, or capable of being made strong enough, to support a hoist at a later date. Within the bath/bedroom wall provision should be made for a future floor to ceiling door, to connect the two rooms by a hoist.
14. The bathroom layout should be designed to incorporate ease of access, probably form a side approach, to the bath and WC. The washbasins should also be accessible.
15. Living room window glazing should begin at 800mm or lower, and window should be easy to open/operate.
16. Switches, sockets and service controls should be at a height usable by all (i.e. sockets 450 – 600mm, switches, door handles and thermostats 900 – 1200mm).

11.91 In addition to these items, the design and layout of new housing should also make provision for the secure storage of bicycles and discrete space for wheelie bins.

BUILDING FOR LIFE

11.92 The Council encourages new residential developments of 10 units or more to achieve a minimum 'silver standard' under the CABE Building For Life scheme. The standard provides a means of assessing the design quality of new developments. Building for Life assessments will be scored out of 20, with scores categorised as:

- Very good - 16 points or more
- Good - 14-15 points
- Average - 10-14 points
- Poor - 10 points or less

Fig. ? Building for Life cover

11.93 Results of the Building for Life Assessments will be reported on as part of the Councils Annual Monitoring Report. The assessment is required for Section H6: Housing Quality which records the number and proportion of total new build completions on housing sites reaching very good, good, average and poor ratings against the Building for Life Criteria.

11.94 The criteria provides a valuable framework to help planners assess the quality of a proposed development and have been set to embody what housing developments should be: functional, attractive and sustainable. Developers should be aware that their application will be assessed against the Building for Life criteria and so are encouraged to submit evidence of how the proposed scheme meets each of the design criteria as part of their

planning application. This could be included within the Design and Access Statement, which will often be the first place assessors will look when undertaking the assessment. The council expects the developers to use the Building for Life criteria (see http://www.buildingforlife.org/about) as the basis for development briefs to help speed up planning approvals and win local community support.

ENVIRONMENTAL PERFORMANCE OF BUSINESS PREMISES

11.95 BREEAM (the Building Research Establishment's Environmental Assessment Method) is regarded by the UK's construction and property sectors as the measure of best practice in environmental design and management for non-residential buildings. The methodology defines the level of performance of a particular building type on a scale from pass to excellent and consideration should be given to achieving a BREEAM rating of at least good for all new commercial structures within South Cambridgeshire.

11.96 The environmental performance of a building should also include consideration of 'embodied energy' – the energy consumed in the production and transportation of building materials, together with the actual on site construction process. So far as is possible, the material selection should promote sustainable forms of construction and favour locally sourced materials that have a low embodied energy.

11.97 Within business parks and large industrial sites the opportunity to incorporate Sustainable Drainage Systems (SUDS) into the design of external areas should be explored.

BIODIVERSITY AND ECOLOGY

11.98 The existing ecology of the site will need to be properly understood. For instance, watercourses and drainage ditches may be the habitat for water voles. Redundant buildings (especially those in rural areas) may be used by barn owls or colonies of bats, while large mature gardens and undeveloped areas within villages can often provide refuges for biodiversity. These green areas may be acting as "stepping stones" or corridors for species such as great crested newts and, therefore, small infill plots should never be disregarded as having no biodiversity potential. When considering in-fill development it may be necessary to provide habitat features, such as native hedge and grass strip planting, to provide continuity of habitats.

11.99 In order to fully consider the potential impact of development upon biodiversity it may be necessary to undertake an ecological assessment appropriate to the size and scale of the development. The requirements and further guidance for the assessment is contained in the Council's Biodiversity SPD.

Table 7: Potential Impact of Smaller Scale Developments on Biodiversity

Development Type	Initial Surveys	Possible Impact	Possible Mitigation
Barn conversion	Bat survey Barn owl nest site survey	Loss of bat roost Loss of barn owl nest site	Time works to avoid disturbing hibernation or breeding periods. Erection of artificial nest sites or create specialist bat roosts.
Listed building alteration	Bat survey to find roost and emergence points. Breeding bird survey or search for nest sites.	Loss of bat roost or access to bat roosts. Loss of bird nesting opportunities	Provision of new access points. Provision of specialist artificial nest sites for house sparrows, starlings or swallows.
House extension and Backland Development	Breeding bird survey Great crested newt survey	Loss of mature garden shrubs Loss of garden pond	Provision of new planting and suitable nest boxes Reconsider design to retain pond, or recreate pond in new location
Creation of boathouse on river or lake	Water vole survey Otter survey Kingfisher nest site survey	Loss of water vole habitat Disturbance of otters Disturbance of kingfisher nest site	Retention of natural water frontage. Sensitive lighting Sensitive screening
Outhouse demolition	Bat survey Search for newts around building periphery (inside and out) Search for nest sites	Loss of bat roost Loss of great crested newt hibernation site Loss of potential bird nesting site	No demolition whilst bat using the structure Provision of alternative hibernation site. Provision of suitable nest boxes
New dwelling on disused plot	Breeding bird survey Phase 1 Habitat Survey (see South Cambridgeshire Biodiversity Strategy) Invertebrate survey Badger survey	Loss of scrub habitat Loss of deadwood habitat for invertebrates Disturbance of badger sett	Provision of suitable nest boxes Provision of new native planting Retention or replacement of deadwood habitat Retention of suitable screening and habitat around sett

11.100 Applicants are strongly advised to discuss all the potential environmental issues at the earliest stage possible with the District Council's Ecology Officer.

PART III SMALLER SCALE DEVELOPMENTS

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CHAPTER 12

INFILL DEVELOPMENTS

12.1 Smaller scale developments include new infill developments within established built environments, small groups and residential schemes, conversions of redundant buildings to appropriate new uses, extensions to existing buildings and minor householder alterations.

CONTEXT

12.2 Infill plots are small-scale plots within existing developed areas. The basic context and criteria for small development infill plots is contained in Part 3.

12.3 New uses may include (but are not limited to) residential and commercial. Mixed-use developments may be appropriate, and will be encouraged where they positively add to the variety of life of the area. Unsuitable new uses would be those that have an adverse impact on traffic congestion and use patterns in the locality.

CRITERIA

12.4 Each infill plot has unique characteristics. Infill plots typically relate to a street or village frontage, and to adjacent buildings and gardens.

12.5 Proposals will be expected to relate well to the topography and geography of a site and to acknowledge the pattern of historical use of that site.

12.6 New buildings should respect important vistas within and views out of streets and settlements. The aim should also be to create new views and juxtapositions of elements which add to the variety and texture of the setting.

12.7 Proposals for infill developments must respect their surroundings. These may contain buildings from the 14th to the 19th Centuries, but that does not mean that the new development should necessarily be pastiche or attempt to mimic historic styles. High quality design, relevant to context, is the most important factor, and a contemporary solution that provides modern spaces, while at the same time considers the scale, materials, grain and elevational rhythm of its context may provide a better solution. Today's high-quality buildings are tomorrow's heritage.

12.8 What may be a difficult site to develop, or a landmark site within a settlement, should generate innovative design solutions and architectural excellence.

CHAPTER 13

ANCILLARY BUILDINGS

CONTEXT

13.1 Ancillary buildings include garden buildings, garages, stables and boathouses. They are subservient to a main building, usually a dwelling.

CRITERIA

13.2 The location, scale, proportions and materials would be characteristic of a subservient building.

13.3 Garden buildings include summerhouses and sheds. In Cottenham, traditional black boarded sheds sit prominently gable on to the road frontage, interspersed between houses, but elsewhere sheds tend to be smaller or set well back in rear gardens. Traditionally, sheds are simple and constructed in brick, flint, clay batt or weatherboard on a timber frame and have a subservient roof material such as thatch, pantile, slate or corrugated iron. Summerhouses are set within a landscape which may be extensive or intimate. They use local materials, sometimes in an imaginative and contemporary way, and have simple balanced proportions. They may hark back to historic examples using substantial materials such as flint or brick, or be much more lightweight in character using timber boarding on a timber frame. Contemporary garden buildings sometimes have large expanses of glass, which may not be appropriate in a historic context and should be sited carefully to avoid becoming a hazard to birds or bats.

13.4 Garages are generally prominent within the streetscape. Within a historic context specific care is needed to ensure they merge into their surroundings. Often the traditional cartshed is used as a basis for the design of a detached garage, but the depth of a garage, even when limited to 5.5 or 6 metres, is greater than many traditional single storey outbuildings and a double garage is almost square, giving roofs that are uncharacteristic of traditional forms. Often where the building is prominent, the depth is visually reduced by incorporating a lower eaves level on one side giving a lean-to with a catslide roof. Where the gable is seen, the lean-to may be set back nominally to give a balanced symmetrical gable. First floors above garages are discouraged as they tend to give a top-heavy appearance. Garage doors are better set in the long elevation rather than the gable as they resemble cart openings but are unlike any proportions of doors traditionally found in gables. Doors to traditionally designed garages in sensitive settings, such as in Conservation Areas, should be traditional side-opening timber doors with traditional wide vertical boarding and external strap hinges. Apart from the garage door, there should be very few

openings and care should be taken to avoid the building appearing domestic.

13.5 Stables and other buildings for animals are generally set to the rear of a site and are agricultural in character with traditional walling and roof materials as described for sheds. New stables are often timber framed with boarding rather than traditional masonry. Poor quality examples have narrow shiplap boards and fibre cement or felt roofs at a very slack pitch. These are not long-lasting and not appropriate for a traditional or historic setting.

13.6 Boathouses are appropriate additions to the waterfront where there is a built-up river frontage and groups of boathouses already, but elsewhere they disturb the tranquility of open views across rural watercourses and meadows. Reflecting the unfussy natural surroundings, they are characteristically low, single storey, lightweight and simple, with timber frame and timber weatherboarded walls.

CHAPTER 14

CONVERSIONS

CONTEXT

14.1 The buildings proposed for conversion include rural and agricultural buildings, industrial buildings, large houses and outbuildings, commercial and community buildings.

14.2 In all cases, the District Council will expect sufficient detail to determine the principle of conversion; to include the significance and character of the building, the efforts made to keep the building in its existing use, and the full implications of the proposed change of use including proposed and necessary changes to the structure, fabric and setting. The retention of the building in its existing use is normally preferable, and if so, the justification for a change of use should include extensive marketing of the building.

14.3 The intention with all conversions is to sustain, enhance and preserve the quality of our built and natural environment. This involves preserving the language of existing buildings, whilst adding to them in ways that respect contemporary building materials and methods of construction. Designs for conversions must aim to facilitate new and sustainable uses without compromising the character of the existing building.

CRITERIA

14.4 Every conversion is unique. To determine how appropriate a building is for conversion, consideration should include location, accessibility, the character of the surrounding area, and the character and condition of the building.

14.5 A building for conversion should be of architectural or historic interest and capable and worthy of retention. Historic buildings within Conservation Areas and Listed Buildings are all considered important and deemed to be worthy of retention. Under PPG15 it is accepted that the best way to ensure the retention of a Listed Building is for it to have an appropriate and viable use. Where the original use has ceased and cannot be reasonably reinstated, or the building is designated as being at risk, the Local Authority will encourage sympathetic conversion, if it represents the best way to retain a Listed Building. However, conversions of Listed Buildings that result in significant loss of historic fabric or elements of the building's special character, and thereby compromise the reason for their listing, will not be supported. There is also a presumption against conversion should the Listed building represent a significant, sensitive and comparatively rare example of a particular period or type of building that would potentially be harmed by any works for conversion, or by works inherent in the specific type of conversion proposed. In those cases, a low key use such as non-

intensive storage would be more appropriate. The building should also be capable of conversion without significant extension.

SPECIAL CHARACTERISTICS

14.6 Special opportunities arise within each situation, and these should be taken advantage of; notable places are made through recognising and enhancing these particular local characteristics.

14.7 The conversion may be directed to a specific type of use by the context, local infrastructure, access roads and local transport links, existing links to communications, and the local provision of employment or residential buildings.

14.8 It is important to understand the special characteristics of the particular building and what makes it capable of conversion. These may be structural, spatial, environmental and architectural.

14.9 To understand the building and the impact of the proposals, a historical study and impact of alternative uses will be required and this should inform the proposals. The extent of information required to establish the acceptability of proposals should be available at an early stage and would include plans, elevations, sections and surveys with overlays of any inserted floors and clarification of any disturbance of an historic timber frame.

14.10 An understanding of the original structure, materials and modes of construction forms an essential basis for any proposal for conversion. Evidence in the form of a structural engineer's report will normally be required to accompany planning proposals.

14.11 Buildings originally constructed with specialised uses may pose a challenge for new use proposals. Examples include churches, chapels and schools, and agricultural and industrial buildings such as barns, stables, drying sheds, maltings and mills. Part of the character of the building may incorporate minimal or no window openings, very low floor to ceiling heights, large undivided internal volumes, fittings and fixtures from the previous use, insubstantial structure, exposed finishes giving minimal thermal provision, large windows or an open rural non-domestic setting. The loss of any element of that character is likely to weaken the interest of the building, and this would need to be considered against the justification and principle of conversion, benefits of the scheme to the future of the building, its setting or local community, and identification of the most sensitive design reasonably possible.

14.12 Rural and agricultural buildings are characterised by simple traditional elevations and materials. The barn may be a large black weatherboarded box or a box in undisturbed brickwork and will provide a challenge to any

designer to provide any windows to sizes required under the Building Regulations without significantly damaging the structure or interrupting the simplicity of the form. In the limited instances where any new build is justified, the character of rural buildings limits it to structures that resemble simple modest traditional farm buildings. Domestic additions such as conservatories or garden rooms are therefore alien in this setting. New outbuildings should be resisted, but where a new building would enhance the group it should respect the scale, form, setting, massing and materials of the original building. Existing ancillary buildings and structures should be retained and repaired. If small, they may be able to accommodate meter boxes or storage. The interior of a barn would normally be an open volume that does not readily accommodate subdivision into rooms or inserted intermediate floors. If there is an attached smaller building, it may better accommodate the smaller spaces. Even where some subdivision is accepted, it would be expected that the majority of the internal volume would remain open. Original features such as doors, vents, boarding, floor bricks and threshing floors should be retained and may limit the use of the building. Original divisions and larger features such as stable stalls should be repaired and retained although in some justified cases they may be relocated within the same space. New fixtures and fittings should retain a simple character in detail and materials, in sympathy with the existing quality of the building; this does not mean reproduction 'heritage' ware, but appropriate design functionality. The setting may be rural and open, so vulnerable to harm by subdivision, car parking and domestic paraphernalia. Conversions should involve a minimum of change to a building's setting, especially the large simple open external areas and rural agricultural boundaries characteristic of the farmstead. Where re-surfacing is considered appropriate, gravel or bound gravel, and occasional limited brick or granite paving may be considered.

14.13 Commercial buildings proposed for conversion are often in village centres or as part of an industrial or agricultural group. The change of use of buildings such as pubs and post offices often represents a significant loss of village and rural facilities. Any proposal for change of use of a community facility should investigate the history of that use, the possibilities of retaining the use including the extent and results of the marketing process, the potential relocation of the community facility, alternative new uses, and the implications of each alternative use on the character and setting of the building, to include highways and parking provision, and signage. If the building has a long historic link with its original use, such as a historic building originally built as a pub, the impact of the proposed change of use is expected to be more harmful than it is to a more recently established use. Signage is an important element of commercial buildings and again if the signage is historic or relates to a historic name of the building, such as the earliest pub names, its loss will not be supported. It will be expected that the proposal would include some enhancement of the site and building where reasonable.

14.14 Restoration of original built fabric is considered an essential part of any conversion. Equally, the objective with any repair or addition is to clearly identify the building's evolution.

14.15 Converting historic buildings can involve complex structural work. For structural surveys, facade retention, underpinning, internal demolitions and temporary works, advice must be sought from a professional structural engineer and negotiated with the Council as necessary.

14.16 Integrating new work with the old fabric is essential to the success of the conversion. However, contemporary insertions should not necessarily be designed in a way which tries to mimic historical styles. A well-considered and detailed contrast can often be a better way to respect and enhance the existing built environment.

14.17 Innovative plan forms and uses are often required to successfully convert a building from its historic use to another. Rather than compromising the fabric and character of the existing building, new uses will be expected to be adapted to fit the constraints and challenges of the building. Some new uses with less flexibility, more subdivision and requirements for numerous new openings are inherently more difficult to accommodate in this way.

14.18 There is an assumption that original openings in the building envelope will be retained, complete with historic frames, doors, windows and shutters, and that new openings in the historic fabric will be kept to a minimum. Original openings that have been subsequently blocked may be re-opened as part of the adaptations. New openings should be justified and only considered where necessary to achieve minimum daylighting levels and it is noted that open plan internal layouts are often easier to light from existing windows. The effect of new windows on the building's elevations must be carefully considered and they should refer to the size and proportions of existing openings.

14.19 A sparing use of rooflights may be acceptable to achieve internal daylighting levels. These may take the form of cast metal conservation rooflights or, in certain instances, larger areas of carefully detailed patent glazing may be appropriate. Dormer windows are usually too fussy unless the building is domestic in character, and are at variance to the simple rooflines found in other vernacular and agricultural buildings. The positioning of any rooflights should reflect structural bays.

14.20 Modern materials, detailing and techniques of construction can add to the quality of a conversion project and may be appropriate when having to repair or replace larger areas of fabric, provided any potential differences in the structures (such as thermal movement and permeability are resolved);

for example, large openings such as barn doors could be suitable for an expanse of minimally framed glazing.

14.21 Old roofs can be a haven for protected wildlife species, such as bats and owls. It is an offence to damage or disturb their habitat, and their presence may have implications for any conversion work. Advice should be sought from the Council's Ecology officer and reference made to the Council's Biodiversity SPD.

CHAPTER 15

EXTENSIONS

CRITERIA

15.1 All extension proposals must offer a high quality of accommodation and design that will sustain, enhance and preserve the quality of our built and natural environment. By definition, extensions are additional components and should consequently remain ancillary or subservient to the original building. Every extension site is different, and will have a different level of impact depending on whether it is at the front, side or rear of a property, or involves work to the roof.

15.2 Extensions should always complement the form and character of the original building rather than seek to transform it into something else. This may be achieved either by continuation of the established design form, or through an appropriate contrast in high quality contemporary design. The design of an extension should not necessarily be pastiche or attempt to mimic historic styles. High quality of design, relevant to context, is the most important factor, and in certain cases a contemporary solution that provides modern spaces, while at the same time considers the scale, materials, and elevational rhythm of its context may provide the better solution.

15.3 The scale of an extension and its position will normally emphasise a subservience to the main building. This will usually involve a lower roof and eaves height, significantly smaller footprint, spans and lengths of elevations, and the use of different and traditionally subservient materials.

15.4 Some buildings are more sensitive to extension than others. Symmetrically designed buildings or buildings with a complete design (such as lodges) or inherently small size may not be able to accommodate an extension without becoming unbalanced or dominated by the extension, or by detracting from the original design. Buildings that have been extended before may also be limited by the cumulative impact of the extensions.

15.5 An analysis of the immediate surroundings should form the foundation of any design. This must consider:

- Whether or not the property is Listed, or is contained within a Conservation Area.
- The location of the extension in relation to the public zone of the street and the nature of that streetscape.
- The effect that the extension will have on adjacent properties and land
- The effect that the extension will have on the existing property.
- The forms and scale of existing built structures near the site.
- Traditional and contemporary building materials used in the locality
  The condition of the land upon which the extension is to be built.

LOCATION

15.6 Many South Cambridgeshire villages present important frontages to the surrounding landscape, contain Conservation Areas and contain or frame numerous strategic views (both within the settlement and out to the landscape). Extension proposals may be to Listed or unlisted buildings, and the sites may be adjacent to buildings of particular architectural merit or important open spaces within the fabric of a settlement. Consequently, the impact of the extensions on the wider village, or landscape, must be considered.

STREETSCAPE

15.7 Adjacent buildings can often provide pointers for the design of an extension. This includes the relationship between the surrounding buildings and the street, and the placement of adjacent buildings (together with any extensions) within their grounds. The immediate context should frame the design approach.

15.8 Extensions on a street frontage should typically follow the pattern set by previous developments on adjacent buildings. This includes the distance from the building's front walls to the pavement edge, and storey heights of buildings. Extensions can dramatically change the character of a street; for example, infilling between detached or semi-detached houses can change the appearance from one of individual villas to a terrace. Consideration must therefore be given to the existing character of the street, to ensure that the extension will not compromise the established rhythm or visual identity.

CHAPTER 16

HOUSEHOLDER MINOR CHANGES

CRITERIA

16.1 Householder applications can be submitted for minor works to single non-listed dwellings, including dwellings in a Conservation Area. The relevant works include conservatories, side or rear extensions and garden sheds and the intention is that the information required with this type of application is simplified. The design will still be expected to be of high quality and appropriate for the context of the building.

CHAPTER 17

LISTED BUILDINGS

CRITERIA

17.1 Special consideration must be given when considering alterations, extensions and other development affecting Listed Buildings, curtilage Listed structures, and their settings. There must be a reasoned justification for the size, use, form, materials and details employed. The character, setting and particular interest of a Listed Building must always be respected and the impact on the historic fabric will be assessed on a case-by-case basis. More detail is contained in the Council's Listed Buildings SPD.

CHAPTER 18

CONSERVATION AREAS

CRITERIA

18.1 The character of a Conservation Area may be assessed in the relevant Conservation Area Appraisal, or in the absence of an Appraisal, an analysis of the special interests of the Conservation Area should be made at an early stage to inform the design.

18.2 The impact of proposed development within a Conservation Area, or within its setting, should be considered prior to making any application, and its special interest should be respected and preserved in any proposals.

18.3 Specific guidance relating to Conservation Areas is contained in the Council's Conservation Areas SPD.

PART IV

PROCEDURES AND APPLICATIONS

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CHAPTER 19

DESIGN DOCUMENTATION

INTRODUCTION

19.1 In order to fully understand development proposals, brought forward for consideration, and to enable the Council to fully engage with developers and their architects, the Council wishes to see how the design has been influenced at all stages of the design process. To assist this it will be of great assistance to have sight of options that have been dismissed.

19.2 The following is an indicative list of the design stages and the documentation the Council wish to see evidence of.

SITE SURVEY

19.3 The site survey is a factual exercise, compiling information about the site and its context. During later discussions it may be necessary to make reference to this information to establish matters of fact, therefore this should be available for reference.

SITE APPRAISAL

19.4 Prior to any design work being undertaken, it is essential that the site in its context is fully understood. This is where the development proposals should be thoroughly assessed against all the facts from the survey, which should result in the clear identification of the constraints that result from existing features or previous use etc. together with the opportunities the site offers. A result of the appraisal process should be the identification as to how a development will be integrated into the existing communities, townscape, landscape and movement patterns.

19.5 The site appraisal should also acknowledge the Government's policy of promoting the re-use of brownfield sites over greenfield development.

19.6 The following checklist identifies areas of research that should be completed before design work commences. Evidence of this research should be summarised in design and planning statements accompanying a planning application. This list should not be considered as the definitive list of matters to be considered.

Table 8: Site Appraisal Checklist

Issue	Possible research required	Reason
Planning background	•Identify relevant Development Plan allocations and policies	To understand the Council's broad approach to the area/topic/site.
	•Identify other planning constraints (presence of listed buildings/ conservation areas and preserved trees etc)	To help determine the significance of site features.
	•Identify relevant planning guidance affecting the site (e.g., planning briefs, village design statements and planning obligations SPD)	To appreciate how the Council wishes to see a site developed and understand how development of the site could fit into a wider planned context.
	•Identify any live planning permissions on the site or in the immediate locality	To determine whether something similar has been tried before.
Relationship of the site to surroundings	Facilities, connection routes, morphology, architecture, etc. Townscape and landscape.	To understand the context of the site.
Accessibility	•Identify train stations, bus services, cycle, footpath and road networks in vicinity of site, together with potential accesspoints	To determine how well connected site is and scope for improved connections.
	•Identify proximity to local facilities.	To determine how well connected site it – this will inform the form/intensity of development that is appropriate.
	•Rights of way	To establish who has access over the land, when and for what purpose, together with the implications for the design.

Existing buildings, features and uses	•Visual inspection/planning history search •Historic buildings analysis in respect of any buildings of regional, national or local importance •Historic analysis in respect of any structure to be demolished within a Conservation Area •Historic Parks and Gardens •Buildings and structures, both historic and recent. •Services (both above and below ground, together with related ancillary structures such as substations).	To identify important buildings and uses. To establish how to ensure compatibility between new and existing uses. To establish the relative significance of buildings and scope issues for future consideration. To establish the relative significance of the landscape for future consideration. The analysis should include an assessment of condition and value. To establish where existing facilities are located, their suitability for future use and their impact on the design if they have to remain in situ.
The property market	•Contact with local agents.	To determine the ability of an area to support non-residential uses. To guide the type of accommodation provided.
Topography	•Views •Levels survey •Orientation	To inform design process. Identify relationship to sun path, exposure to prevailing wind etc.
Landscape features	•Refer to Landscape Character study. • Identify natural and man-made features and landscape – field patterns (which may be ancient and include 'ridge and furrow' patterning), trees and hedgerows, other landscape features, water-bodies and watercourses.	To determine significance of landscape character. The analysis should include a tree report with an assessment of condition and potential for wildlife habitat. The analysis should include the contribution of water-bodies to drainage/flood prevention and ecological value.

Ecology, flora and fauna	•Preliminary site visit and desktop study.	To determine the likelihood of protected species and landscape features of ecological or aesthetic value within or adjacent to the site.
	•Check whether any sites designated for nature conservation within or near site. Visit www.naturalengland.org.uk for information on nationally/internationally designated sites.	To assess the potential for promoting biodiversity. To establish significance of any such sites.
	•Arboricultural survey in accordance with BS 5837:2005	To determine the significance and amenity value of trees on and near the site.
	•Wildlife/habitat survey For information on protected species visit www.naturalengland.org.uk	To determine the presence of protected species and levels of biodiversity, to help devise mitigation strategies and enhancement measures.
Geology and ground conditions	•Desktop study	To understand the nature of historic and adjoining uses that may lead to contamination. To identify geology and soils to inform foundation design and direct the selection of plant species for landscape works.
	•Intrusive investigations for potential contaminated land.	To identify the specific nature and degree of any potential contamination and the steps / measures required to ensure development is suitable for proposed end use.

Risk of flooding	•Identify watercourses, drainage ditches, lakes, ponds and drains. •Check Environment Agency flood maps (available on their web site at www.environment-agency.gov.uk). Undertake flood risk assessment for both the site and the risks/implications downstream. Pollution	Identify potential sources of flooding. To determine flood risk and whether a Flood Risk Assessment is required. To establish whether the principle of development is acceptable and determine what special measures may be required to enable development. To identify the extent of any quality issue and determine design implications and considerations.
Archaeology	•Scheduled Ancient Monuments •Desktop study •Intrusive investigations.	To identify specific features associated with the site. To determine the likelihood of items of interest being discovered during site development. To determine the specific nature of deposits to enable a strategy for dealing with the archaeology to be devised.
Noise	•Site visit, enquiry to SCDC •Noise pollution testing Noise measurement / assessment Noise Predictive Modelling	To identify significant noise generators or noise sensitive uses in the locality. To determine how likely the site is to be affected by noise, and what measures are required to make particular use combinations or types of development work and deliver a suitable noise environmet(see PPG24), (including flight paths). Noisy development impact.

Air quality	•Site visit/enquiry to SCDC Council • Pollution testing Air Quality Monitoring Detailed Air Quality / Emission Monitoring	To determine the whether air quality is an issue ie locating sensitive receptors in an air quality management area and whether the area is an air quality management area. To identify the extent of any air quality issue and determine design implications and considerations.
Utilities	•Letters to utilities asking form information on the presence of equipment, capability of their systems to accommodate new development.	To identify work required to enable development and establish hidden costs may be involved in developing the site.
Health	•Contact local Primary Care Trust & Public Health Specialist at SCDC •Health impact assessment. Building Health Communities	To identify the scope of any issue with capacity at local surgeries. To determine the impact of new development on existing health facilities and identify appropriate measures to offset impact.
Education	•Contact Cambridgeshire County Council Schools Service	To determine whether there are capacity issues at local schools that need to be addressed through planning obligations relating to new development.
Energy Survey		

Party Wall Act.	Development in close proximity to, or abutting, existing property fabric is subject to the requirements of the Party Wall etc Act.	This sets out duties in respect of notifying and procedures, and includes facade retention, structural demolitions, temporary works and surveys to minimise adverse impacts. Advice must be sought from a professional structural engineer and/or surveyor where appropriate. Although this is not a planning matter consideration should be given to it to prevent future problems.

19.7 The information gathered through the site analysis should be graphically summarised in the form of a Site Appraisal Diagram, which should then be included as part of any subsequent planning application (thereby enabling the Council to fully understand those aspects that may have influenced the design).

19.8 The output from this analysis should be summarised into a Site Appraisal drawing that should pull together the principal constraints and opportunities in a graphical form. It is anticipated that this site appraisal will form part of any subsequent planning application, helping those assessing the application to understand the thought process that was behind the design.

DESIGN CONCEPT

19.9 At the outset of the design process it should be made clear to the Council what the intended design concept is, and how following the site analysis it is appropriate for the development and the site context. The concept should clearly identify the underlying ethos of the scheme in relation to the social, commercial and/or educational purpose, the visual and aesthetic intent and imagery, the environmental performance, etc. A clear design concept will ensure that all subsequent stages of the design process are undertaken in the context of clear direction to ensure the correct decisions are taken to achieve a particular end.

CONCEPT DIAGRAMS

19.10 A concept diagram illustrates how the key principles of the design concept will be applied to the site in the context of the site appraisal, indicating how the development proposal responds to the constraints and opportunities presented by the site and its surroundings.

PARAMETER PLANS

19.11 The design principles should be plotted to produce parameter plans that establish the key structuring principles of the development. These should include the movement network and hierarchy, development areas, open space areas, frontages, building heights, etc.

MASTERPLANS

19.12 On large-scale sites a masterplan will be needed to complete the overall structuring of the development proposals. Larger scale development sites are likely to be realised in a number of phases, often with different developers preparing detailed proposals for adjacent phases. It is essential that the overall masterplan for the development clearly identifies through routes, pedestrian and cycle ways, structural landscape areas and the like that may need to be continued from one developer's site onto an adjacent site. The site specific proposals prepared by the separate developers will then be expected to acknowledge these common aspects, and to incorporate them into their individual proposals in a positive manner.

19.13 The Commission for Architecture and the Built Environment (CABE) has been tasked by the Government to ensure that significant projects within the Sustainable Communities Plan (which include developments such as Northstowe) are well designed and based on proper masterplanning. The Department for Communities therefore agreed that CABE should become a non-statutory consultee for such projects and CABE encourages developers and local authorities to seek their advice at an early stage in the development of these projects. Initial contact with CABE should be via the Design Review Programme Officer at CABE, The Tower Building, 11 York Road, London, SE1 7NX. Tel: 020 7960 2400.

DESIGN AND ACCESS STATEMENTS

19.14 Planning and listed building applications must be accompanied by a Design and Access Statement. Section 327A of the Town & Country Planning Act 1990 specifies that applications not accompanied by a Design and Access Statement shall not be "entertained". This means that they cannot be registered as valid applications.

19.15 Design and Access Statements are not required with planning applications for changes of use (not involving operational development), householder applications outside a Conservation Area, advertisements, reserved matters, engineering or mining operations, and tree works.

19.16 A Design and Access statement is required with Listed building applications, although the Access statement can be omitted for applications only involving internal works.

19.17 A statement covering design concepts and principles and access issues must now be submitted with an application for planning permission and listed building consent. The key facts are:

- A Design and Access Statement is required for all Planning Applications (outline or full).
- South Cambridgeshire District Council is precluded from entertaining an application unless it is accompanied by a Design statement and an Access statement, where required.
- One statement should cover both design and access, allowing applicants to demonstrate an integrated approach that will deliver inclusive design, and address a full range of access requirements throughout the design process.
- A Design and Access statement is a concise report accompanying and supporting a planning application to illustrate the process that has led to the development proposal, and to explain and justify the proposal in a structured way.
- Design and Access statements must not be used as a substitute for drawings and other material required to be submitted for determination as part of the planning application itself. They provide an opportunity for developers and designers to demonstrate their commitment to achieving good design and ensuring accessibility in the work they undertake, and allow them to show how they are meeting, or will meet the various obligations placed on them by legislation and policy.
- The level of detail required in a design and access statement will depend on the scale and complexity of the application, and the length of the statement will vary accordingly. Statements must be proportionate to the complexity of the application, but need not be long.
- For local planning authorities, Design and Access statements will enable them to better understand the analysis that has underpinned the design and how it has led to the development of the scheme. This will help negotiations and decision-making and lead to an improvement in the quality, sustainability and inclusiveness of the development.
- Design and Access statements will allow local communities, access groups, amenity groups and other stakeholders to involve themselves more directly in the planning process without needing to interpret plans that can be technical and confusing. This will help to increase certainty for people affected by development and improve trust between communities, developers and planners. It will also enable the design rationale for the proposal to be more transparent to stakeholders and the local planning authority.

What is required in a Design & Access Statement?

19.18 A design and Access Statement should include (as required by Circular 01/06):

- A contextual appraisal of the site.
- A Statement explaining the design principles in terms of amount, layout, scale, landscaping and appearance.
- A Statement explaining access in terms of how access for all will be achieved to building entrances and in terms of movement and circulation around the site, and also access and provision for emergency and waste vehicles.
- A rationale of how the proposed design reflects the local, regional and national policies.

19.19 For detailed information go to Section 3 of DCLG Circular 01/2006, the Cabe Design and Access guidance document and the Cambridgeshire Design Guide for Streets & Public Realm (Cambridge Horizons 2007), which complements the Government's Manual for Streets.

LANDSCAPE DESIGN STATEMENTS

19.20 This should be read in the context of the Council's Landscape SPD.

19.21 The Landscape Design Statement should include:

1. Its relationship to the details recorded in the site analysis (see Section 3.1.1 above) including:
   - the existing landscape character;
   - any vegetation to be lost;
   - methods to protect and manage existing trees and hedges.

   Note; the retention of existing landscape features is important on any development and can add significantly to the initial character of that development.
2. New areas for planting that will form part of the Public Open Space (POS) within the development
   - Landscape buffer zones will be required along rural/open edges to the countryside. As a guide, a 10m depth would be required for a 20-house development and this width will need to be increased proportionally for larger developments. These areas may provide screening, mitigation, enhancement and/or recreation. Ideally they should be retained within the public realm;
   - Internal areas to comply with the SCDC open space requirements providing Local Areas of Play (LAPs) and other play areas, greenways connected to footpaths and cycle ways, and open areas;

- New areas of planting that will fall within the curtilage of dwellings and other new structures (these do not form part of the Public Open Space, but the planting may form part of the enclosure onto that space and be considered as part of the overall design concept).

3. The general landscape principles anticipated for the overall development
   - indicating form and purpose, colour and seasonal interest;
   - defining and creating spaces and a sense of identity/place;
   - linking new planting and footpaths into existing vegetation, greenbelts, areas of SSSI, Rights of Way etc.;
   - creating wildlife corridors both within the development and out into the wider countryside.
4. Issues relating to sustainability
   - Use of spoil; if it is to be retained on site, how is it to be used, e.g. if landforms are to be created how they relate to the local character, or if spread over the entire site acknowledgement of the additional foundation requirements;
   - Water; the use of swales, balancing ponds, underground storage etc., with any impacts and/or restrictions that this may impose;
   - Solar gain; to ensure that tree planting can be implemented without compromising light and heat.
5. How the planting relates to and considers the final user:
   - Local Areas of Play and other play areas;
   - Youth shelters;
   - Business parks;
   - Playing fields;
   - Benches for use by the elderly and infirm.

   Any dual use areas, such as bridleways and drainage way-leaves, should also be clearly annotated with any restrictions that they may impose.
6. The existing and proposed drainage patterns e.g. the use of underground storage, swales, or balancing ponds should be clearly indicated, and how they integrate into the landscape being created.
7. Where applicable, the details of haul-routes and any short-term impact they may have, plus mitigation measures.

LANDSCAPE DESIGN DETAILS

19.22 The specific landscape details submitted to the local authority for approval should include:

- The Landscape Design Statement outlined above.
- Plan layouts incorporating planting details; including species, size of stock, density of planting and, where possible, sourcing of local stock. Note; the extensive/exclusive use of columnar/fastigiated forms of larger trees is unlikely to be accepted. The plan layout will be

expected to contain practical planting areas, to ensure good establishment and long-term retention.

- Management detail;
  a) Maintenance regimes
  b) Who is to adopt the Public Open Space? Note; all areas that are to be retained or adopted into public ownership should be clearly identified on the drawings.
  c) How it is to be financed.
- Regeneration details (where applicable).

19.23 Other issues that may need to be considered, dependent on the site, include:

- N/S orientation; the penetration of sunlight into the development
- Tree pits; particularly in hard surface areas.
- The proximity of trees (both new and existing) to proposed buildings and structures; consideration must be given to the final canopy spread and sufficient space must be allowed for the trees to develop without extensive tree surgery being required. Foundation details may also need to take into consideration both the need to avoid damage to existing roots and allow for the future spread of tree roots; it may be that a specialist foundation design will be required to ensure a scheme can be delivered and retained in the long term. Reference should also be made to relevant British Standards and Codes of Practice.
- Ground preparation; including ripping, decompacting and aerating.
- Safety Issues; the landscape design should consider the requirements of Secured by Design. Again allow sufficient space to ensure that planting can be included without compromising the safety of users.
- Highway issues.
- Service routes; these should avoid all existing trees and their canopies, together with proposed new planting areas. Encouragement should be given to providing contained service ducts.
- Topsoil storage; this should be in accordance with the relevant British Standard to ensure that the quality does not deteriorate unnecessarily.
- Free standing, external, public art incorporated within larger developments should be considered as an integral part of the landscape design.
- Lighting needs to be carefully designed and located to reduce light pollution, particularly into the wider countryside. Wherever possible lighting should be integrated within the landscape design.
- In certain locations lighting can be used to greatly enhance the landscape design and provide legibility to an area.
- Hard surfaces should be created using high quality materials reflecting the local character and employing a limited palette of materials in any particular location. In certain tight locations there may not be sufficient space for planting and it may be more appropriate for the landscape design to be provided entirely through the use of hard materials.

- Boundary treatment is an integral part of the landscape. In general the outer boundaries should reflect the rural setting through the use of native hedging, and with post and wire fencing in place of close boarded fencing. In most rural areas high walls to the street scene should be avoided unless it is an integral part of an overall design and reflects the local character.
- Unique features and focal points can be included within the landscape, whilst still respecting the overall setting and site. The use of new and existing water features can greatly enhance areas, but they must be located with due consideration to safety and maintenance.
- Where specific themed areas are to be created within the landscape, sufficient time and money will need to be set aside to allow for their development.

19.24 Following completion of an approved landscape design, the developer will be expected to provide information to new residents on the landscaping, setting out why it is to be retained and how it is to be maintained.

HERITAGE STATEMENTS

19.25 Heritage statements are required for non-householder Planning Applications within or adjoining Conservation Areas, adjoining Listed Buildings, or impacting on other Heritage assets. The level of information required will vary dependant upon the complexity of the scheme, but should contain a brief history of the development site, including a planning history and maps, and an assessment of the significance of the building and impact of the proposals. The Heritage statement should be submitted separately to the Design and Access statement and it is recommended that the information for the Heritage statement is obtained at an early stage in order to inform the design. For further information the Council's "Guidance for the Production of Heritage Statements" should be consulted and is on the Council's website.

CONSERVATION STATEMENTS AND CONSERVATION PLANS

19.26 Listed Buildings, and in particular those listed at Grade I and II*, should have more detailed Conservation Statements in the form of Conservation Plans. These Conservation Plans will help ensure the future well-being of these important structures, and will also include an assessment of significance. A Conservation Plan should be an A4 document illustrated with drawings and photographs arranged under the following headings, though this may need to be adapted to suit individual heritage assets:

- Summary
  A brief single page statement summarising the main conclusions of the plan.

- Background
  Authorship and circumstances of the plan, its scope and any limitations of the study, a note of all consultations undertaken and a statement concerning the adoption of the plan by all the major stakeholders in the listed building concerned.
- Understanding the asset
  An analysis of the site that draws together documentary and physical evidence, and is illustrated with images, maps and phasing plans.
- Assessment of significance
  An assessment of the significance of the asset both generally and in detail for each of its main components, making value judgements about the degree of historical, biological, wildlife, geological, cultural, aesthetic, archaeological, social and other types of significance.
- Defining Issues (i.e. vulnerability)
  Details of the issues that have affected the significance of the site in the past affect it now or may do so in the future.
- Conservation Policies
  Puts forward policies for the conservation of all aspects of the significance of the asset, which show how: its significance will be retained, defines a conservation philosophy, prioritises repairs and, where relevant, identifies appropriate new uses.
- Implementation and review
  Identifies a strategy for implementing the Conservation Plan and sets out who will review the Plan and when.
- Appendices
  To contain detailed information that is summarised elsewhere within the document.

SUSTAINABILITY, WATER CONSERVATION AND RECYCLING STATEMENTS

19.27 'Major development' (over 1,000m^2 or 10 dwellings) applications require the submission of a Sustainability Statement and a Health Impact Assessment to demonstrate how the sustainability criteria have been fulfilled.

19.28 They also require a Water Conservation Strategy and a Resource Re-use and Recycling Scheme.

19.29 All planning applications should be accompanied by a completed Management Design Guide ToolKit to allow the effective evaluation of the waste management requirements for a development.

19.30 SCDC local requirements require the submission of noise information if it is considered a determining factor. It is not always obvious when and what level of noise information is required and government guidance recommends that the local planning authority LPA should not require a level of detail to be provided that is unreasonable or disproportionate to the scale

of the application. To ensure a smooth passage through the planning system, even when a full environmental assessment is not mandatory, proposals for developments on noisy sites, or sites which generate noise should take account of noise. Further information on the requirements are contained in Appendix 6.