



sustainable development and design

section eight



8. Sustainable Development and Design

'Good design ensures attractive, usable, durable and adaptable places and is a key element in achieving sustainable development.' (PPS1: Delivering Sustainable Development)

'Local authorities should promote resource and energy efficient buildings; community heating schemes, the use of combined heat and power, small scale renewable and low carbon energy schemes in developments; the sustainable use of water resources; and the use of sustainable drainage systems in the management of run-off.' (PPS1: Delivering Sustainable Development)

Policy Link - Core Strategy Policy KP2; Development Principles
Core Strategy Policy CP4: The Environment and Urban Renaissance - 1

229. The aims of the Council in delivering true sustainability are broader than ecology and the reduction of energy consumption. Sustainable development should provide a better quality of life for everyone, now and in the future. The concept of sustainable development has been around for a number of decades, its main aims are defined in the Government's 'A Better Quality of Life' (1999) as:

- Maintenance of high and stable levels of economic growth and employment
- Social progress that meets the needs of everyone
- Effective protection of the environment
- Prudent use of natural resources

230. A significant proportion of UK energy consumption and CO₂ emissions comes from building construction and operation or from travelling between buildings. Therefore the planning and building process should aim to minimise the environmental impacts of buildings, or positively influence the social and economic impacts of them, which will contribute to sustainable development.

231. However, it should be noted that in some instances, for example alterations to historic buildings, sustainability objectives may be in direct conflict with other planning and design criteria and

the extent to which the development can follow the sustainability guidelines may be more limited.

232. All applications should make some contribution to sustainable development. This may involve a number of different techniques and technologies depending on the characteristics of the development.

233. The following planning considerations in particular are key factors of sustainable development and new developments should be designed to embrace the aims of sustainable development, without compromising the overall design quality.

Major applications are required to submit a Sustainability Appraisal as part of application which should include an appraisal on the opportunities for carbon reduction, carbon neutral building and sustainable technologies. Also see Section 15 - Making an Application

8.1 Redevelopment or Refurbishment?

234. Refurbishment and reuse of existing buildings usually requires significantly less energy than building new ones and therefore supports the aims of sustainable development. This option should be seriously considered particularly where the existing building makes a positive contribution to local character or where it can form the basic building block of a new development. This must always be the first option in the historic environment.



This building at the 'Growing Together Community Garden' is constructed of straw bales which have then been clad with timber boarding.

8.2 Resource Minimisation

Policy Link - Core Strategy Policy KP2: Development Principles – 11a
Core Strategy Policy CP4: The Environment and Urban Renaissance - 3

235. Resource (and waste) minimisation is a key part of sustainable development and new developments can make a significant contribution in this area both during construction and in their operation. Resource minimisation involves reducing the amount of energy used (and waste generated) and the efficient use of natural resources such as water and energy. Water in particular is scarce in the Eastern Region and new development in the Borough must have particular regard to this and be designed to make efficient use of water wherever possible.

236. Significant performance improvements can be achieved very cheaply if they are considered from the outset rather than in an ad hoc nature. The following list identifies what should be considered at each stage in the development process:

Design Stage

- Retain and refurbish rather than rebuild.
- Orientate the buildings and design fenestration to maximise daylight and reduce the need for artificial light.
- Design for water efficiency and water recycling.
- Consider designing modular components



The memorial chapel in North Road Cemetery is being renovated and converted to offices and will include air source heat pumps, PV tiles and rainwater harvesting.

which can be manufactured off site Design to Lifetime Homes Standards to maximise adaptability of units for future occupiers.

- Design the building to be easily adapted for changing uses in the future.

Construction Stage

- Use high quality, robust materials which tend to last longer. Use recycled and sustainably sourced materials. Use local suppliers and local labour.
- Use standard components where appropriate.
- Minimise over ordering and damage of materials.
- Aim to recycle demolition waste materials in the construction of the new development – e.g. as the sub structure of new roads.
- Operate the Considerate Contractors Scheme
- Consider planting more trees to offset pollution during construction.

Operation Stage

- Monitor water and energy usage.
- Provide facilities within each unit for recycling and composting.
- Implement Travel Plan policies.

Resource Minimisation in Historic Buildings

237. It is usually possible to improve the energy saving performance of historic buildings with the subtle use of materials or systems that make a significant difference without altering the character of the building. However, inappropriate materials and installation can cause damage to the historic fabric of a building. The choice of materials and installation will need to be carefully considered. Even small measures such as installing draught proofing on the windows and energy efficient light bulbs can make a significant difference and will not affect the historic fabric of listed buildings. It is always advisable to discuss proposals with the Council beforehand.

238. Where extensions are proposed to historic building, up-to-date performance standards should be integrated to the design wherever possible.

Examples of various resource minimisation options are outlined in Appendix 6. All new development should seek to include as many of these options as possible and details should be outlined in the

Sustainability Appraisal. Southend Borough Council is currently undertaking a Water Cycle Study in conjunction with other South Essex Authorities. The outputs of the study will indicate the degree to which the area is water stressed, indicating measures that should be taken to ensure water efficiency. This information will be available on the Council's website in due course.

8.3 Mix of Uses

'Policies should promote mixed use developments for locations that allow the creation of linkages between different uses and can thereby create more vibrant places' (PPS1: Delivering Sustainable Communities)

Policy Link - Core Strategy Policy CP4: The Environment and Urban Renaissance – 2
Core Strategy Policy CP 8: Dwelling Provision – 5, 6

239. A mixed use scheme can be defined as a layering of uses within one building or a mix of uses in one development or neighbourhood.

240. The benefits of mixed use development include:

- Giving priority to employment generating uses such as retail and offices at lower levels.
- Adding vibrancy and vitality to the streetscene and variety and interest to the townscape.
- Reducing the need to travel to shops, workplaces and community facilities.
- Creating mixed and balanced communities.
- Greater community safety through increased natural surveillance throughout the day and night.

241. Reducing the need to travel is an important objective of Sustainable Development, and mixed use development will be encouraged in the Borough's town and local centres and public transport corridors, where it is important to give priority to employment generating uses, particularly at ground level. The mix of uses will depend on local character, need and location.

8.4 Flexibility

'Planning should promote adaptability through development that can respond to changing social, technological and economic conditions.' (By Design. CABE, 2000)

242. It is essential that new buildings are able to adapt to the changing needs and trends of society otherwise they may become obsolete and impractical well within their life span. Flexible buildings allow the occupiers to personalise the buildings to suit their working and living requirements, and increase the variety of available uses. Buildings that incorporate mixed uses and provide the facility for live work units will reduce the need for travel. Most developments located in district and local centres should include commercial development particularly at ground level.

243. New commercial buildings in particular, should be designed to have flexible internal layouts to enable the business to grow within itself e.g. be subdivided to provide a range of unit sizes.

Also see Section 8.3 Mix of Uses above

8.5 Site Layout and Orientation

244. The site layout and orientation of buildings can play an important role in creating a more sustainable building. For example buildings orientated within 30 degrees of south and well spaced benefit most from passive solar gain and



This cardboard club room at Westborough Primary School combines public art with recycled materials.



Bris Soleil sun shading on the south elevation of the Royal Bank of Scotland offices in Prince Avenue.

have maximum daylight. This reduces the need for artificial heating and lighting however the benefits of solar gain need to be weighed against the disbenefits of too much solar gain so that the need for artificial cooling is minimised. Natural ventilation and solar shading should be integral to the design where required.

245. Other aspects of the site such as local microclimate, exposure, natural shading, atmospheric pollution, ground water levels and drainage need also to be assessed, ensuring that the site's maximum potential is realised.

8.6 Built Form

Policy Link - Core Strategy Policy CP4: The Environment and Urban Renaissance – 3, 4

246. The actual built form and detailing of a new building should also play a significant role in promoting sustainable development. For example, buildings can incorporate sustainable technologies such as natural ventilation and locally sourced and recycled materials. The lifespan and ongoing maintenance of buildings also has implications for sustainability. Developments built from high quality materials not only look better, but generally last longer and require less maintenance. When constructing new buildings it is important to ensure that both the internal and external layouts make the best use of the space available and avoid the creation of unusable and negative spaces.

8.7 Water Recycling and Sustainable Urban Drainage Systems

Policy Link - Core Strategy Policy KP2; Development Principles – 11b

247. The Thames Gateway is a water stressed area where water is a scarce resource. There is greater pressure placed on the water available for people and the environment than in other areas of the country. New development places extra demand on existing water resources. In order to minimise this demand all new developments should be designed to be water efficient and minimise water consumption and conversions and renovations should retrofit water efficiency measures where possible. These measures will help reduce the water use of the Thames Gateway and contribute towards the goal of water neutrality. Water efficiency measures include spray taps, water efficient showers and appliances, low flush toilets and water butts. Residential development should use less than 95 litres/head/day of water which is in line with Code for Sustainable Homes Level 4.

248. Larger developments sites in particular, should also aim to include rainwater harvesting, water recycling technologies and Sustainable Urban Drainage Systems (SUDS).

8.7.1 Water Recycling

249. Water recycling of some form has the potential to be incorporated into all new development in some way. There are three options:

- Rainwater harvesting - water collected from roofs via traditional guttering, through down pipes to an underground tank(s). It is then delivered on demand direct to toilets, washing machine and outside tap use. More than 50% of mains water can be substituted by rainwater. Rainwater can also be harvested by installing a water butt.
- Grey water recycling - involves the reuse of wash water (from washing machines, dishwashers, baths and showers). It involves diverting waste water into tanks where it is passed through a filtering system and then redirected to an outside tap

or used to flush toilets or for washing machines.

- Black water recycling goes a step beyond grey water recycling in that everything that goes down the drains (including toilet water) is recycled through more complex treatment tanks or reed beds and is reused.

250. All new development should look to include some form of water recycling.

8.7.2 Sustainable Urban Drainage Systems

251. Current Government Policy requires developments to return as much storm water to the ground or recycling system as close as possible to the source. This can be achieved by employing the principles of SUDS. SUDS provide an alternative approach to managing runoff from buildings and hardstandings. They mimic natural drainage patterns, can reduce surface water runoff, encourage recharge of groundwater and provide amenity and biodiversity enhancements through a range of different techniques. Larger developments will therefore be expected to employ some SUDS techniques as part of the overall scheme.

252. When selecting a SUDS it is important to consider quality, quantity and amenity design criteria equally. There may not be a single solution, several options may meet the design criteria and technical judgement will be needed.

253. An early initial assessment of the site will be required to enable the site specific requirements for the drainage system to be established and used to inform the wider scheme design. The initial assessment should include a soil investigation report to determine the suitability of the site for SUDS. This will also establish the level of the water table and its susceptibility to seasonable variations and tidal pressures, which are significant in areas such as Shoeburyness. For larger sites a Drainage Strategy may be required which should identify the appropriate type of SUDS, how it will be provided and how it will be maintained. The potential for contamination should also be investigated when assessing the suitability for SUDS. Where contamination is present, infiltration drainage may not be possible as this provides a direct pathway for contamination into the groundwater. Alternative SUDS techniques which do not involve infiltration should be considered.

254. New development should be designed to retain an existing water features such as ponds and ditches. Retention of these features will help to ensure existing habitat is protected and drainage structures are retained to reduce the impact of flooding.

255. The Council's primary aim is to achieve effective drainage for all new schemes so that the new development and existing communities and business (as well as the carriageway) are protected from flooding. It is possible and may be desirable for several systems to be employed on one site including a variety of SUDS techniques.

256. All SUDS schemes should consider reuse of the run off (grey water recycling) and where possible this should be designed into the system. This may include basins and ponds for storage and use for irrigation.

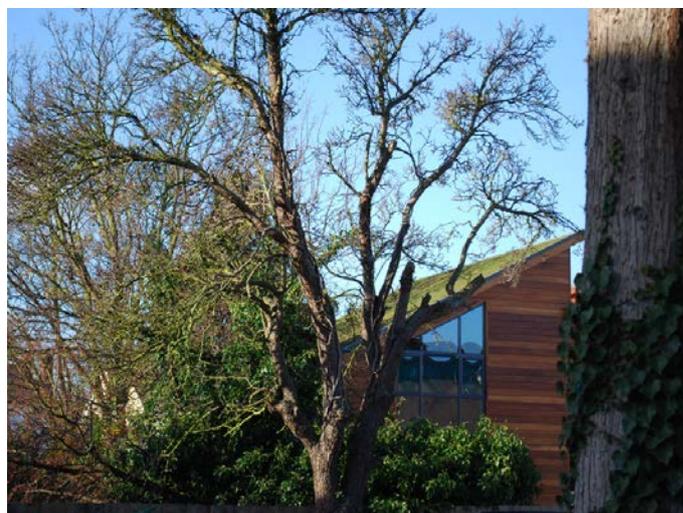
257. The main SUDS techniques are:

Prevention (Minimising runoff)

This involves minimising paved areas and minimising directly connected paved areas. Rainwater recycling can remove runoff from the drainage system altogether.

Filter Strips and Swales

These are vegetated surface features (swales are long shallow channels whilst filter strips are gently sloping areas of ground) that drain water evenly off impermeable areas. These are often integrated with the landscaping scheme.



A green roof on a new development in Milton.

Water Recycling (see above)

258. It is important that consideration is given to the long term maintenance of SUDS and in all cases a SUDS maintenance agreement will be required. Where considered appropriate, a contribution to the ongoing maintenance costs of SUDS infrastructure may be sought via a S106 agreement.

For further information see Communities and Local Government Publication 'Improving the flood performance of new buildings' which can be viewed at www.communities.gov.uk See also Appendix 6 which gives examples of resources minimisation options including building design techniques.

8.8 Renewable Power Generation

Policy Link - Core Strategy Policy KP2; Development Principles - 11

259. **Core Strategy Policy KP2 requires that 10% of the total energy needs of all new development must be provided from renewable sources on site (and /or decentralised renewable and recycled energy sources).** This will help to achieve a Code for Sustainable Homes Level 4 or an 'excellent' BREEAM rating which the Council aspires to for all new development. There are many options available for renewable power generation, however, the right combination will depend on what is most appropriate for the site, size and type of unit. Options for renewable power must be considered at the beginning of the design process to enable them to become an integral part of the design of the scheme.



Chalkwell Hall in Chalkwell park has been fitted with a variety of renewable energy technologies including micro wind turbines, solar PVs & solar thermal panels and a biomass boiler system.



The green roof has many environmental benefits including reducing run off, improved biodiversity and good thermal performance.

Permeable and Porous Surfaces and Filter Drains

These are devices that have a volume of permeable material below ground to store surface runoff. The water passes through the surface to the permeable fill. (Note..both the surfacing and the base need to be permeable) The water can then be disposed of by either infiltration, underdrain or pumped out to be used as grey water recycling or into the sewer system after the storm has passed and there is spare capacity.

Infiltration Devices

These drain water directly into the ground. They may be used at source or the runoff can be conveyed through a pipe or swale to the infiltration area. They are completely below ground level. They allow the removal of solid and increase the soils natural drainage ability.

Basins, Reed Beds and Ponds

These are areas designed to store large volumes of surface runoff. They can be either normally dry areas that become wetland such as floodplains or balancing ponds with spare capacity to enable them to hold more water when it rains. These can often be combined with creating habitats for wildlife.

Green Roofs

These are vegetated roofs or roofs with vegetated spaces. The benefits of green roofs include reduced air pollution, improved biodiversity, improved thermal performance and reduced surface water run-off.



Solar thermal panels on the 'Growing Together Community Garden' project in Prittlewell Chase.

outlined, in detail, in the Sustainability Appraisal. For further information on the Code for Sustainable Homes and Appendices 5 and on the following websites www.communities.gov.uk Further information on BREEAM can be found at www.breeam.org

8.9 Code for Sustainable Homes

'Building a home to the Code means that sustainability is designed in. By building to Code standards, we can make Britain's homes more environmentally friendly for the future.' Greener Homes for the Future: Code for Sustainable Homes Publication (DCLG, 2008)

The applicant will be required to demonstrate how this requirement will be met as part of the planning application supporting documentation. For larger schemes this information will be required as part of the planning application otherwise the application will be considered invalid. A specialist consultant may be required.

Renewable Power Generation and the Historic Environment

260. The application of renewable energy technologies on listed buildings, locally listed buildings and buildings in conservation areas will be carefully considered. The affect on the appearance of the building and its setting will be a key consideration. Whether the fabric of the building will be able to support the technology (for example the additional weight and forces of a micro wind turbine) will also need to be justified. Applicants should consider all the options and choose the most appropriate type of renewable energy generation for each situation. For example, solar panels may be acceptable where they can be hidden in a roof valley and technologies such as ground source heat pumps can also have minimal visual impact. In conservation areas and for locally listed buildings, the public view of the building takes precedent over elevations that have no public impact. It may be possible to site technologies at the rear where they cannot readily be seen. For listed buildings the considerations will be more complex.

Options for renewable power generation can be found in Appendix 7. New development should include a variety of these and they should be

Policy Link - Core Strategy Policy KP2: Development Principles – 11a

261. The Code for Sustainable Homes measures the sustainability of a home in the following areas:

- Energy and CO2 Emissions
- Water
- Materials
- Surface Water Run-off
- Waste
- Pollution
- Heath and Wellbeing
- Management
- Ecology

262. The Code uses a sustainability rating system, indicated by 'stars', to communicate the overall sustainability performance of a home. A home can achieve a sustainability rating from one (*) to six (*****) stars depending on the extent to which it has achieved Code standards. One star (*) is the entry level – above the level of the Building Regulations; and six stars (*****) is the highest level – reflecting exemplar development in sustainability terms:

- 1* homes will be 10% more energy efficient and 20% more water efficient than most new homes and may also have some of the other features such as providing office work space with communication links within the home, secure cycle storage or greater security features.
- 3* homes would be 25% more energy efficient and have many more sustainable features than a 1* home.



An explanation of how the Code Level will be reached should be included within the planning application supporting documentation.

An overview of the assessment criteria for the Code for Sustainable Homes can be found in Appendix 5. Full technical details can be found at www.communities.gov.uk Further information on the Nottingham Declaration can be found at www.energysavingtrust.org.uk/nottingham

8.10 Non-Residential Buildings - BREEAM Assessment

Wind turrets at Shoebury High School draw fresh air into the atrium and provide natural ventilation. This building also incorporates a grey water recycling system.

- 6* homes would be highly sustainable and over the course of the year their net carbon emissions would be zero. Needing over 90% of the points available, a 6* home would include most of the sustainability features in the Code.

263. Code homes encourage their owners to live a more sustainable lifestyle and are built in a more efficient way, using materials from sustainable sources. This creates less waste and reduced running costs.

Requirement

264. The Council has now signed up to the Nottingham Declaration and is therefore committed to tackling climate change and significantly reducing carbon emissions across the Borough. The aim being to achieve the Government's plan to make all new homes zero carbon by 2016. The building sector is a major contributor to carbon production and by ensuring that we build better insulated and more efficient homes, and by promoting renewable energy sources the Council can honour this commitment. We will therefore be requiring that all new homes be built to a minimum of Code for Sustainable Homes Level 3 with a view to moving towards Code Level 4 over the next few years. This supports the Government's aspiration for the Thames Gateway to lead the way as an Eco-Region (as set out in the Eco-Region Prospectus) and is in line with Core Strategy Policies KP2 and CP4. The Code Level achieved is a material consideration in any planning application.

265. The sustainability performance of non-residential building can be measured by using the BREEAM Environmental Assessment Method. BREEAM assesses the performance of buildings in the following areas:

- Energy Use
- Water
- Materials
- Pollution
- Health and Wellbeing
- Management
- Ecology
- Transport
- Land Use

266. Developers and designers are encouraged to consider these issues at the earliest opportunity to maximise their chances of achieving a high BREEAM rating. Credits are awarded in each area according to performance. A set of environmental weightings then enables the credits to be added together to produce a single overall score. The building is then rated on a scale of pass, good, very good or excellent and a certificate awarded, which can be used for promotional purposes.

Requirement

267. As with residential development all new commercial development will be expected to contribute to the sustainability of the Borough and we will therefore be requiring that all new commercial buildings to achieve a BREEAM 'very good' rating (or equivalent) with a view to moving towards an 'excellent' rating (or equivalent) over the next few years. This requirement is in line with Core Strategy Policies KP2 and CP4. The Code Level achieved is a material consideration in any planning application. An explanation of how the Code Level will be reached

should be included within the planning application supporting documentation.

For further information see www.breeam.org Further information on the Nottingham Declaration can be found at www.energysavingtrust.org.uk/nottingham

8.11 Maximising Travel Choice

Policy Link - Core Strategy Policy KP2: Development Principles – 8

Core Strategy Policy CP3: Transport and Accessibility – 2

Core Strategy Policy CP4: The Environment and Urban Renaissance - 6

268. All new development should provide links to a range of transport networks and facilities so that the users have the widest possible travel options. This must include creating a safe and attractive environment for pedestrians and cyclists (including covered and secure cycle storage as part of any development) and enhancing public transport links wherever possible.

269. Travel to work accounts for a significant amount of car journeys and therefore large commercial developments are required to produce a Travel Plan to demonstrate how the principles of sustainable development will be incorporated.

For further information on Travel Plans see Section 13 Making an Application



The dry garden at Chalkwell Park has been specifically designed to cope with the challenges of climate change.

8.12 Biodiversity

'Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design.' (PPS9: Biodiversity and Geological Conservation)

'Biodiversity offers an opportunity to link together various aspects of your development proposal. These include open space, recreation, sustainable transport links such as footpaths and cycle ways, sustainable design and construction, sustainable drainage and landscape.' (Essex Biodiversity Project)

Policy Link - Core Strategy Policy KP2: Development Principles – 11e

Core Strategy Policy CP4: The Environment and Urban Renaissance – 2, 9, 10

270. New development should recognise the ecological importance of including wildlife features and open space as part of their design. Trees and plants play an important role in the biodiversity of the Borough as they can provide food, shelter, nesting sites and safe corridors of travel for a variety of wildlife including mammals, birds and insects.

271. The existing biodiversity value of each development site should be assessed at the outset to identify any areas of significant biodiversity value. Newly created habitats can take years to flourish, so established semi-natural habitats should be retained as much as possible within new development. Some UK species (e.g. bats and badgers) have been afforded special protection by law and, where they occur, exclusion zones or special mitigation measures may be required. In these cases, advice from a specialist consultant must be sought.

272. New areas of habitat should be connected to existing green spaces and where possible, located to provide missing links in the Borough's green grid network. The aims of the Thames Gateway South Essex Green Grid include the creation of high quality green spaces and links that enable a diversity of wildlife, habitat and landscapes. Native plant species, in particular species suitable for a coastal environment, are generally preferred as they are more appropriate for local wildlife. Species which are drought tolerant and requiring little maintenance



The affordable housing development (on the right) of the Chapel Quarter A at Shoebury Garrison is indistinguishable from the rest of the development.

are also considered a more sustainable option.

273. The expansion of our habitat links and greenways is one of the objectives of the Local Development Framework and landscaping schemes which connect with the Boroughs existing green corridors will be welcomed. Proposals will be assessed for their contribution to biodiversity.

274. In addition to the biodiversity benefits of retaining existing trees one of the other significant benefits of mature trees, especially in urban areas, is their contribution to alleviating the affects of Climate Change and this should also be considered.

Examples of how development can contribute to local biodiversity can be found in Appendix 8. An Environmental Statement will be required for certain sites. For further information see Section 13 Making an Application.

For further information on Biodiversity in the Borough see the Southend-on-Sea Biodiversity Action Plan (2003) and Essex Biodiversity Project. For information on protected species visit www.englishnature.org.uk For further information on the Thames Gateway Southend Essex Green Grid visit www.tgessex.co.uk

8.13 Affordable Housing

'High quality and inclusive design should create well-mixed and integrated developments which avoid segregation and have well-planned public spaces that bring people together and provide

opportunities for physical activity and recreation.'

(PPS1: Delivering Sustainable Development)

'Proposals for affordable housing should reflect the size and type of affordable housing required.'

(PPS3: Housing).

275. In order to achieve sustainable communities we must have a good and well integrated blend of different housing types and tenures in our residential areas. Affordable housing is a key part of this mix.

276. There will always be a demand for affordable housing in the Borough and larger residential developments will be expected to contribute to the supply of affordable homes in accordance with the Council's policies and according to the needs of the local community. This will be delivered through appropriate legal agreements.

8.13.1 Requirement

Policy Link - Core Strategy Policy CP8 – 3a, 3b

277. Core Strategy Policy CP8 sets out the requirement for affordable housing in new residential development schemes. Proposals of 10-49 units or 0.3-1.99 hectares will be required to provide not less than 20% affordable housing or key worker provision. Larger proposals will be required to provide not less than 30% affordable housing or key worker provision. The affordable housing offer should provide a range of unit sizes that reflect the mix of the development and meet the Boroughs affordable housing needs. The Council will negotiate with developers to ensure that the appropriate type and sizes are provided on larger schemes.

Further information on the type of affordable housing required for the Borough can be found in the Thames Gateway South Essex Strategic Housing Market Assessment which can be viewed on the Council's website www.southend.gov.uk

8.13.2 Integration

278. Affordable housing should be indistinguishable from adjacent private housing. The integration between the affordable housing and the private units within any singular scheme must be seamless and not of a lower quality, including the quality of landscaping, amenity space,

location, views, materials and parking provision. All affordable housing units must be built to 'Lifetime Homes Standards'.

For further details on Lifetime Homes Standards see Appendix 4

8.13.3 Management

279. It is recommended that where developments involve affordable housing, a Registered Social Landlord should be engaged at an early stage in the development process in order to establish a formal working relationship to ensure specific requirements are inherent within the design and to provide the most appropriate size and type of unit. This is a more straight forward process now, given the changes to funding streams for Registered Social Landlords and so early contact is essential.

A list of local housing associations and registered social landlords can be found on the Council's website www.southend.gov.uk