Section 3. Responding to Climate Change and Managing Resources

How Policies in This Section Deliver Sustainable Development

3-1. The Local Plan will seek to ensure that Cambridge develops in the most sustainable way possible. This means delivering our social and economic aspirations without compromising the environmental limits of the city for current and future generations, so that Cambridge becomes a low carbon, water sensitive city with a thriving economy. For this to be achieved, a holistic approach to sustainable development and reducing the environmental impact of development should be embedded within all development proposals from the outset.

3-2. This section focuses on how the Local Plan will contribute to the achievement of sustainable development in terms of how the plan will address the challenge of mitigating and adapting to our changing climate as well as other resource management issues. Climate change mitigation focuses on designing new communities and buildings to be energy and resource efficient, utilising renewable and low carbon energy generation and promoting patterns of development that reduce the need to travel by less environmentally friendly modes of transport. Climate change adaptation focuses on ensuring that new developments and the wider community are adaptable to our changing climate. For Cambridge, this is likely to involve an increase in the urban heat island effect due to increasing temperatures and an increase in flooding, both from rivers and watercourses and from surface water flooding following periods of intense rainfall. Policies are included with the objective of making Cambridge a water sensitive city, where new developments contribute to an overall flood risk reduction and help improve the quality of water bodies. This section also seeks to ensure that new development contributes to improvements in the environmental quality of Cambridge, including improvements to air quality, reduction in noise and better management of waste.

Climate Change and Sustainable Design and Construction

Policy 9. Carbon Reduction, Community Energy Networks, Sustainable Design and Construction and Water Use

Developments will be permitted where it is demonstrated how the proposals meet the presumption in favour of sustainable development. This will include the integration of the principles of sustainable design and construction as far as is reasonable and proportionate to do so. Developers of major development, including redevelopment of existing floor space, should prepare a Sustainability Statement as part of the Design and Access Statement, submitted with their planning application, outlining their approach to tackling the following issues:

i. adaptation to climate change;

ii. carbon reduction;

iii. water management;

iv. site waste management; and

v. use of materials.

In order to ensure that the growth of Cambridge supports the achievement of national carbon reduction targets, and does not exacerbate Cambridge's severe water stress, all new development will be required to meet the following minimum standards of sustainable construction, carbon reduction and water efficiency, unless it can be demonstrated that such provision is not technically or economically viable:

New Residential Development

Year	Minimum Code for Sustainable Homes Standard	On-Site Reduction of Regulated Carbon Emissions relative to Part L 2006	Water Efficiency
2014	Level 4	44%	80 litres/head/day
2016	Level 4	44% - 60% on-site, with remainder dealt with through Allowable Solutions (as per national zero carbon policy)	80 litres/head/day

New Non-Residential Development

Year	Minimum Code for Sustainable Homes Standard	On-Site Carbon Reduction	Water Efficiency
2014	Very good	In line with 2013 Part L	Full credits to be achieved for category Wat 01 of BREEAM
2016	Excellent	In line with 2016 Part L	Full credits to be achieved for category Wat 01 of BREEAM
2019	Excellent	In line with national zero carbon policy	Full credits to be achieved for category Wat 01 of BREEAM

In order to promote the use of community energy networks, a Strategic District Heating Area is shown on the Proposals Map. Major development proposals within this area should where possible connect to existing or proposed heat networks. This requirement will be relaxed should applicants be able to provide evidence that doing so would impact on the viability of schemes.

3-3. It is increasingly recognised that one of the most important factors in delivering a successful scheme is ensuring that sustainability is a key part of the brief for any development and is therefore integrated into the design from the outset. This almost always leads to a better design and lower overall lifetime costs, as options are greater at an early stage and there is more scope to identify options that achieve multiple aims. Sustainable design and construction is concerned with the implementation of sustainable development at the scale of individual sites and buildings. It takes account of the resources used in construction, and of the environmental, social and economic impacts of the construction process itself and how buildings are designed and used.

3-4. The choice of sustainability measures and how they are implemented may vary substantially from development to development. However, the general principles of sustainable design and construction should be applied to all scales and types of development. The following areas should be covered in the Sustainability Statement:

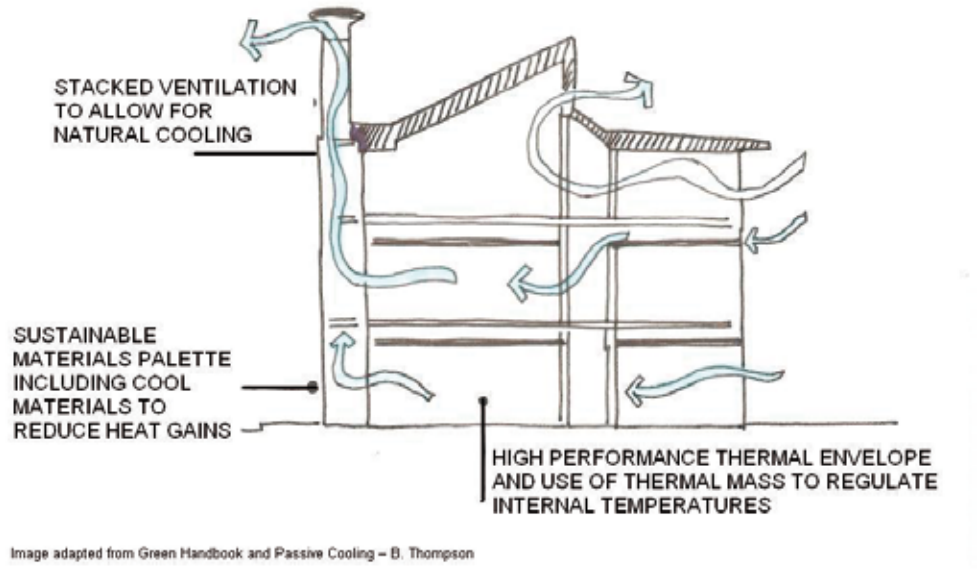
i) Climate Change Adaptation

3-5. Climate change adaptation is a term that describes measures that can be put into place to help new and existing communities adapt to the changes in our climate that are now inevitable. For Cambridge, the climate risks, as set out in the Council's Climate Change Risk Assessment and Management Plan (2009), are:

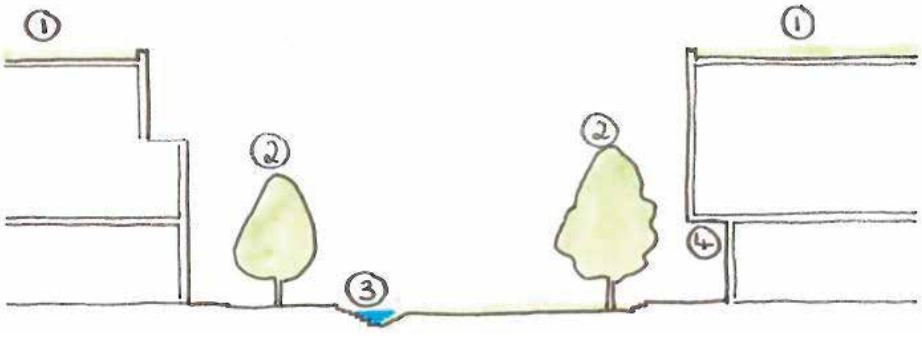
- Increased peak summer temperatures, with summer temperatures 1.5 degrees higher by the 2020s and 4 degrees higher by 2080;
- Drier summers with 7% less summer rain by the 2020s and 26% less by the 2080s;
- More intense storms including higher peak rainfall and winds;
- Lower overall annual rainfall.

Figure 5 Approaches to Climate Change Adaptation

A: Building Scale Approaches



B: Site Wide Approaches



(1) Green roof to slow down building runoff and reduce internal cooling loads

(2) Enhanced tree canopy cover to provide shade and increase evaporative cooling

(3) Integration of Sustainable Drainage into the public real to manage surface water, increase evaporative cooling and enhance biodiversity

(4) Building overhangs to reduce excessive summer solar gain

Figure 6 External shutters may become a necessary addition in the UK. Image courtesy of AC Architects.

3-6. Planning has an important role to play in shaping places and securing new development so as to minimise vulnerability and provide resilience to impacts arising from climate change, doing so in ways consistent with cutting greenhouse gas emissions. All developments should be designed to be adaptable to our changing climate, both in terms of building design and green and blue infrastructure. Adaptation measures can be implemented on a variety of scales, from individual buildings up to community and conurbation scale, as described in the Town and Country Planning Association's "Climate change adaptation by design. A guide for sustainable communities" (2007).

3-7. The Sustainability Statement within the Design and Access Statement will need to illustrate the different adaptation measures that have been implemented, and some examples of how this could be approached are provided in Figure 5, Figure 6, and Figure 7. These figures and images are for illustrative purposes only and the precise measures to be implemented will vary from development to development, taking account of the context of each specific proposal. In some instances, there may be opportunities for adaptation measures that will have benefits beyond site boundaries, and opportunities for measures that will have a cumulative impact in areas where development is to be phased should also be pursued.

Figure 7 Angled façade increases solar gain in the winter and reduces unwanted heat in the summer

ii) Carbon Reduction

3-8. All development should be designed to minimise carbon and other greenhouse gas emissions associated with new development, taking account of the hierarchical approach to reducing carbon emissions. A three-pronged approach should be taken that minimises the energy demand of new buildings, utilises energy efficient supply through low carbon technologies and supplies energy from new, renewable energy sources, as illustrated in Figure 8.

3-10. All new developments should be designed to optimise the reduction of construction waste through design and to maximise the reuse and recycling of materials at all stages of a developments life cycle. Development proposals should also provide well designed, integrated recycling and waste facilities for future occupants helping to increase recycling and reduce waste being sent to landfill. Consideration needs to be given to internal and external storage capacity. Reference should be made to the requirements set out in the RECAP Waste Management Design Guide and the Council's own guidance on household water recycling facilities in new development. The Council will be supportive of innovative approaches to waste management.

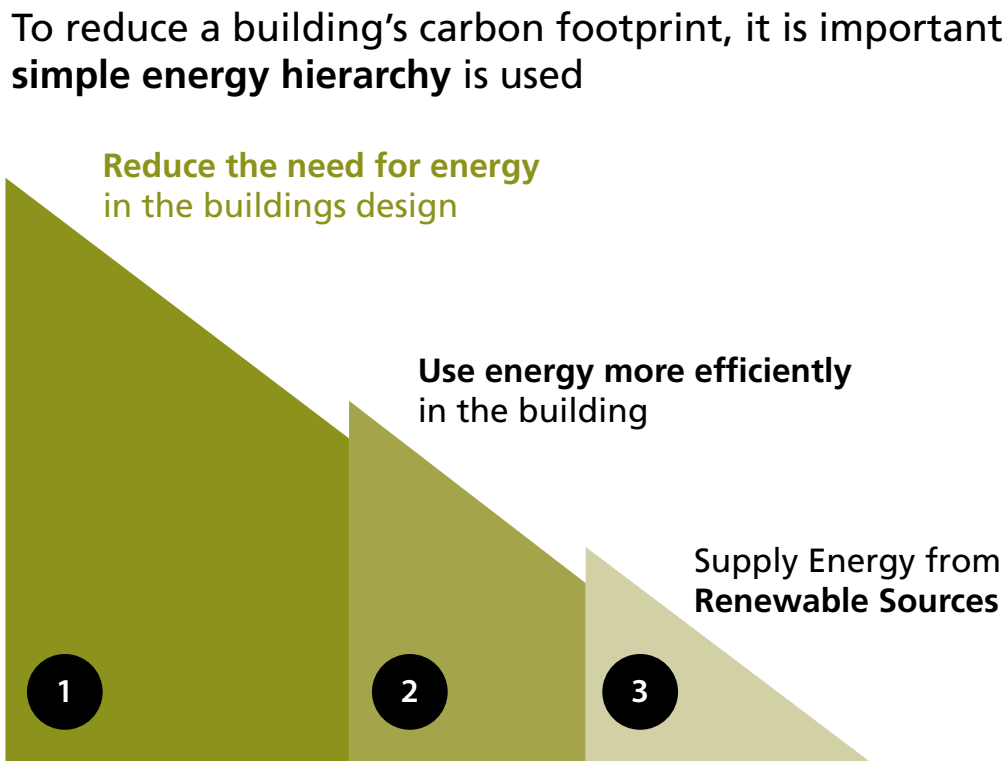


Figure 8 The Energy Hierarchy

iii) Water Management

3-9. Cambridge is in an area of severe water stress. The introduction of high levels of water efficiency in new developments is therefore vital to ensure the long-term sustainability and viability of development. As such, new development will need to be designed to optimise the opportunities for efficient water use, reuse and recycling, including integrated water management and water conservation. Designing water conservation measures into infrastructure and buildings to reduce per capita water demand should be a fundamental approach for all new development. Policy 9 above sets targets for water consumption in line with Levels 5 and 6 of the Code for Sustainable Homes for new housing and BREEAM standards for non-residential development.

iv) Site Waste Management

3-11. All new developments should be designed to optimise the reduction of construction waste through design and to maximise the reuse and recycling of materials at all stages of a developments' life cycle. Development proposals should also provide well designed, integrated recycling and waste facilities for future occupants helping to increase recycling and reduce waste being sent to landfill. Consideration needs to be given to internal and external storage capacity. Reference should be made to the requirements set out in the RECAP Waste Management Design Guide and the Council's own guidance on household waste and recycling facilities in new developments. The Council will be supportive of innovative approaches to waste management.

v) Use of Materials

3-12. All new developments should be designed to maximise resource efficiency and identify, source, and use environmentally and socially responsible materials. There are four principle considerations that should influence the sourcing of materials:

- Responsible sourcing – sourcing materials from known legal and certified sources through the use of environmental management systems and chain of custody schemes including the sourcing of timber accredited by the Forestry Stewardship Scheme (FSC);
- Secondary materials – reclaiming and reusing material arising from the demolition of existing buildings and preparation of sites for development as well as materials from other post consumer waste streams;
- Embodied impact of materials – the aim should be to maximise the specification of major building elements to achieve an area-weighted rating of A or B as defined in the Green Guide to Building Specification. Consideration should also be given to locally sourced materials;
- Healthy materials – where possible developers should specify materials that represent a lower risk to the health of both construction workers and occupants. For example, selecting materials with zero or low volatile organic compound (VOC) levels to provide a healthy environment for residents.

3-13. As well as the consideration of these design and construction issues, the Sustainability Statement in support of the application should also address how the proposals meet all other policies relating to sustainability throughout the plan, including:

- Biodiversity and ecology;
- Land, water, noise and air pollution;
- Transport, mobility and access;
- Health and wellbeing including provision of open space;
- Culture, heritage and the quality of built form, including efficient use of land.

3-14. This policy also sets out requirements in relation to sustainable construction standards, carbon reduction and water efficiency. The Climate Change Act 2008 contains a statutory target of securing a reduction in carbon dioxide levels of 80% below 1990 levels by 2050, with an interim target of 34% reduction by 2020. The achievement of national targets for the reduction of carbon emissions will require action across all sectors of energy use. Within Cambridge, this will involve balancing the overall increase in emissions associated with new development with the opportunities that these new developments offer for reducing carbon and greenhouse gas emissions, through measures such as improving energy efficiency and the provision of on-site renewable and low carbon energy generation. A high standard of construction in new development is therefore important if the UK is to meet its legally binding carbon reduction targets.

3-15. Nationally described sustainable construction standards have been developed for both new homes (the Code for Sustainable Homes) and new non-residential buildings (BREEAM). Alongside these standards sits the Government's zero carbon policy agenda, which requires all new homes to be zero carbon by 2016, and all non-residential buildings to be zero carbon by 2019, with public buildings leading the way in 2018.

3-16. There are many approaches that can be taken to meeting the construction standards required by this policy including construction methods such as Passivhaus standard. The Council will be supportive of innovative approaches to meeting and exceeding the standards set out in policy. Where other construction standards are proposed for new developments, for example LEED (Leadership in Energy and Environmental Design), these will be supported provided that it can be demonstrated that they are broadly in line with

the standards set out above, particularly in relation to carbon reduction and water efficiency.

3-17. It may be possible in some areas for development to exceed the policy requirements set out above. For example, developments located within the Strategic District Heating Area may be able to achieve higher levels of carbon reduction than set out in policy, which in turn could lead to higher construction standards being achievable. In order to maximise opportunities to exceed minimum policy requirements, developers will be encouraged to engage with the Council from an early stage through pre application discussions. The policy will also be reviewed periodically so that should any significant changes be made to the construction standards, the policy can be updated to reflect these changes.

3-18. Where redevelopment/refurbishment of existing buildings is proposed, the development of bespoke assessment methodologies to assess the environmental impact of the proposals for submission with the planning application will be supported.

vi) Community Energy Networks

3-19. The Strategic District Heating Area coincides with a district heating project being undertaken by Cambridge City Council and the University of Cambridge, as well as the findings of the Decarbonising Cambridge Study (2010) and Cambridgeshire Renewables Infrastructure Framework (2012).

3-20. A benefit of such an approach is that it can provide developers with a ready made solution for them to meet their future planning policy and Zero Carbon policy requirements at minimum cost, particularly in constrained city centre sites where opportunities for other renewable and low carbon energy generation would be limited. Requiring new buildings to be compatible with district heat networks entails the following considerations:

- Ensuring that plant rooms have access arrangements for entry of a heat main;
- Ensuring that the flow and return heating temperatures for buildings are optimised to suit the heat networks;
- Ensuring that other buried services do not create barriers to laying heat mains, and, where possible, providing suitable duct space;
- Ensuring that the layout and density of new development is such that it minimises, as far as possible, the cost of laying heat mains, and
- Ensuring that individual sub-metering arrangements are out in place for each development..

Policy 10. Allowable Solutions for Zero Carbon Development

Where compliance with national zero carbon policy necessitates the use of the Allowable Solutions Framework, developers will have the option to:

i. deliver their own allowable solutions locally;

ii. make a contribution to the Cambridgeshire Community Energy Fund; or

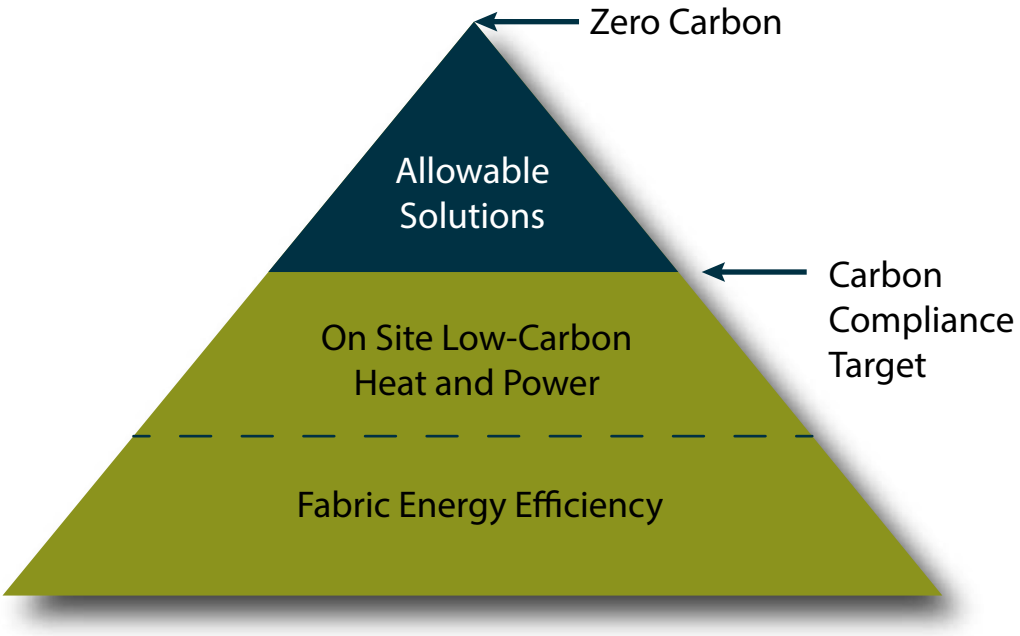
iii. offset via third-party allowable solutions providers into a project selected from a local Energy Efficiency and Renewable and Low Carbon Energy Infrastructure Projects List.

The Cambridgeshire Community Energy Fund will be used to invest in energy efficiency and renewable/low carbon energy projects that have direct benefit for Cambridgeshire. Projects for investment will be identified and form part of an Energy Efficiency and Renewable and Low Carbon Energy Infrastructure Projects List, which would then be used as the basis for allocating developers allowable solutions contributions.

3-21. By 2016 all new homes are expected to be zero carbon under national zero carbon policy. Part of the definition of zero carbon development includes the concept that after delivering a certain level of carbon reduction on-site, known as 'carbon compliance', developers can then choose to offset remaining emissions through a range of measures known as 'allowable solutions', as illustrated in Figure 9 . Allowable solutions are grouped into three categories:

- On-site options (not duplicating carbon compliance measures) such as the installation of smart appliances, home electric vehicle charging and LED street lights;
- Near-site options such as the export of low carbon heat from a site based district heating scheme or retrofitting low/zero carbon technologies to local community buildings; and

Figure 9 Allowable Solutions



- Off-site options such as investment in district heating pipework to connect new loads to existing schemes or support new schemes.

3-22. One of the measures included within the Allowable Solutions Framework is the development of community energy funds. Developers would be able to choose to pay into such a fund, to offset any residual carbon reduction that could not be delivered on-site. Money from the fund would then be used to invest in energy efficiency and renewable and low carbon energy projects. Money will be collected via a bespoke Allowable Solutions collection mechanism and not linked to the Community Infrastructure Levy or Planning Obligations.

3-23. The Cambridgeshire Community Energy Fund project has looked at the potential to set up an innovative locally led fund that would channel developer investment from allowable solutions into local low carbon infrastructure projects. The establishment of this fund will be an effective mechanism for ensuring that the benefits of allowable solutions remain within Cambridgeshire, having direct community benefit for the areas in which development is being undertaken.

3-24. Projects for investment will be identified and form part of an Energy Efficiency and Renewable and Low Carbon Energy Infrastructure Projects List, which would then be used for the basis of allocating developers allowable solutions contributions. Arrangements for producing the local projects list will be put into place ahead of the policy coming into effect in 2016. This list will be kept updated to ensure that projects providing maximum benefit, both in terms of carbon savings and benefits for Cambridgeshire residents and the local economy are given priority. All projects on the list would need to meet the test of 'additionality', i.e. projects that would not otherwise be delivered via existing support mechanisms. This list is being developed as part of the Cambridgeshire wide Mobilising Local Energy Investment project.

Policy 11. Renewable and Low Carbon Energy Generation

Proposals for development involving the provision of renewable and/or low carbon energy generation, including community energy projects, will be supported, subject to the acceptability of their wider impacts. As part of such proposals, the following should be demonstrated:

i. that any adverse impacts to the environment, including local amenity and impacts on the historic environment, including its setting, have been minimised as far as possible. These considerations will include air quality concerns, particularly where proposals fall within or close to the Air Quality Management Area(s) or areas where air pollution levels are approaching the EU Limit Values, as well as noise issues associated with certain renewable and low carbon technologies;

ii. that where any localised adverse environmental effects remain, that these are outweighed by the wider environmental, economic or social benefits of the scheme.

3-25. Increasing the proportion of energy generated from renewable and low carbon sources will help Cambridge to meet its vision of a low carbon city. As well as national targets for carbon reduction, there are also targets in relation to energy supplied from renewable energy sources, with a legal commitment for the UK to meet 15% of its energy requirements from renewable sources by 2020 .

3-26. A number of studies have assessed Cambridges' potential for renewable and low carbon energy generation. These studies suggest that the main focus for renewable and low carbon energy generation will be from the potential Cambridge offers for the development of district heat networks and the utilisation of microgeneration such as solar panels. The Council recognises that the opportunities for stand-alone renewable energy schemes within Cambridge are limited. However, it is keen to support opportunities where they arise, in particular small-scale and community schemes that are most likely to be viable within Cambridge.

3-27. While the Council wishes to promote renewable and low carbon energy generation, there is also a need to balance this desire against other objectives for the city such as minimising pollution and protection and enhancement of the historic environment. Applicants are expected to have taken appropriate steps to mitigate any adverse impacts through careful consideration of:

- Location, scale, design and other measures, including those necessary to minimise any noise impacts;
- Cumulative impacts;
- Impacts on the landscape, the built environment, cultural heritage and biodiversity.

3-28. Other policies in the Local Plan concern the safeguarding of the natural and historic environment and the protection of international, national or locally designated sites and buildings, and these should be taken into account in applications for energy schemes.

3-29. Potential impacts may be acceptable if they are minor, or are outweighed by wider benefits including the need for energy from renewable and low carbon sources, which will contribute to reducing carbon and other emissions.

Policy 12. Energy Efficiency Improvements in Existing Dwellings

In order to assist with achievement of the Plan's vision for a low carbon city, and to tackle issues of rising fuel costs for residents, applications for extensions to existing dwellings and/or the conversion of ancillary residential floorspace to living accommodation, should be accompanied by cost effective improvements to the energy efficiency of the existing dwelling, where such measures have not already been implemented.

The aim of the policy is to help homeowners implement measures that will enhance the energy efficiency of their homes, therefore helping to reduce fuel costs at a time of rising energy prices. In some cases this might help to reduce the risk of homeowners finding themselves in fuel poverty, or in cases where residents are already in fuel poverty, help to get them out of this situation.

3-30. The focus is on cost effective measures with a simple payback of seven years or less and that would be relatively simple to install with limited disruption. Many of these measures will be eligible for funding through the Green Deal. Cambridge City Council, alongside the other Cambridgeshire local authorities and Cambridgeshire County Council will be taking a partnership approach to delivering the Green Deal across the county, in order to ensure that it is a success and that the uptake of energy efficiency measures in buildings is maximised. Working with a local Green Deal provider the authorities will be taking an active role in promoting the Green Deal to local residents, which will assist with the delivery of this policy.

3-31. Care will need to be taken in applying the policy to Listed Buildings and other heritage assets to ensure that they are not damaged by inappropriate interventions. The implementation of the policy will be on a case by case basis, with officers recommending measures that would be suitable for that particular property, bearing in mind its age, type of construction and historic significance. There may be cases where improvements cannot be made to an existing dwelling without causing harm to the significance of the heritage asset, and in such circumstances the requirements of this policy will not be implemented.

Integrated Water Management

Policy 13. Integrated Water Management and the Water Cycle

Development will be permitted provided that in the design:

i. surface water is managed close to its source and on the surface where it reasonably practicable to do so;

ii. priority is given to the use of nature services;

iii. water is seen as a resource and is re-used where practicable, offsetting potable water demand and that a water sensitive approach is taken to the design of the development;

iv. the features that manage surface water are commensurate with the design of the development in terms of size, form and materials and make an active contribution to making places for people;

v. surface water management features are multi-functional wherever possible in their land use;

vi. any flat roof, is a green or brown roof providing that it is acceptable in terms of its context in the historic environment of the city (see Policy x) and the structural capacity of the roof if a refurbishment. Green or brown roofs should be widely utilised in large scale new communities;

vii. there is no discharge from the developed site for rainfall depths up to 5 mm;

viii. the run-off from all hard surfaces shall receive an appropriate level of treatment in accordance with The SuDS Manual (CIRIA C697) to minimise the risk of pollution; Development adjacent to a water body actively seeks to enhance the water body in terms of its hydromorphology, biodiversity potential and setting; and

ix. watercourses are not culverted and any opportunity to remove culverts is taken.

Note: Nature services is defined by the National Planning Policy Framework as 'The benefits people obtain from ecosystems such as, food, water, flood and disease control and recreation'. These are also known as ecosystem services.

3-32. The Surface Water Management Plan and Strategic Flood Risk Assessment for Cambridge have found there is little or no capacity in our rivers and watercourses that eventually receive surface water runoff from the city and that it needs to be adequately managed so that flood risk is not increased elsewhere. The appropriate application of sustainable drainage systems to manage surface water within a development is the approach recommended within the Technical Guidance to the National Planning Policy Framework as a way of managing this risk.

3-33. Current best practice guidance such as The SuDS Manual and Planning for SuDS (CIRIA C697 and C687) should be followed in the design of developments of all sizes, with design principles that are important to Cambridge set out in this policy. The use of smaller more resilient features distributed throughout a development instead of one large management feature should be utilised. Figure 10 provide examples of how to successfully integrate SuDS into a range of developments.

3-34. Managing water close to where it falls and on the surface is often the most cost effective way to manage surface water. Early consideration in the design process helps achieve this. Managing water on the surface is an opportunity to celebrate water and create Cambridge distinctive developments.

3-35. Climate change will see times of too much water and times of too little water more frequently than we get now. The design of new developments should reflect this change and value water as a resource than can be stored in times of plenty for re-use in times of deficit.

3-36. Green/brown roofs are a key measure in terms of Cambridge's climate change adaptation policy. They offer multiple benefits for a comparatively small additional construction cost, including forming part of an effective sustainable drainage solution, reducing the amounts of storm water run-off and attenuating peak flow rates. In the summer, a green roof can typically retain between 70-80% of rainfall run-off. Predicted climate change means that Cambridge will experience increasing risks of flooding, overheating and drought, manifested through hotter drier summers and warmer wetter winters. Living roofs can reduce the negative effects of climate change, for example by improving a building's energy balance and reducing carbon emissions. The use of vegetation on a roof surface ameliorates the negative thermal effects of conventional roof surfaces through the cooling effect of evapotranspiration, which can also help ameliorate the Urban Heat Island Effect. It can also provide benefit in the form of insulation, helping to reduce the internal cooling load of buildings thereby reducing energy use and associated carbon emissions. The biodiversity benefits of green roofs are manifold, supporting rare and interesting types of plant, which in turn can host a variety of rare and interesting fauna. Accessible roof space can also provide outdoor living space, particularly in high density development. As such, accessible roof space should be viewed as an integral element of a well-designed, high quality, high density, more efficient, attractive and liveable city.

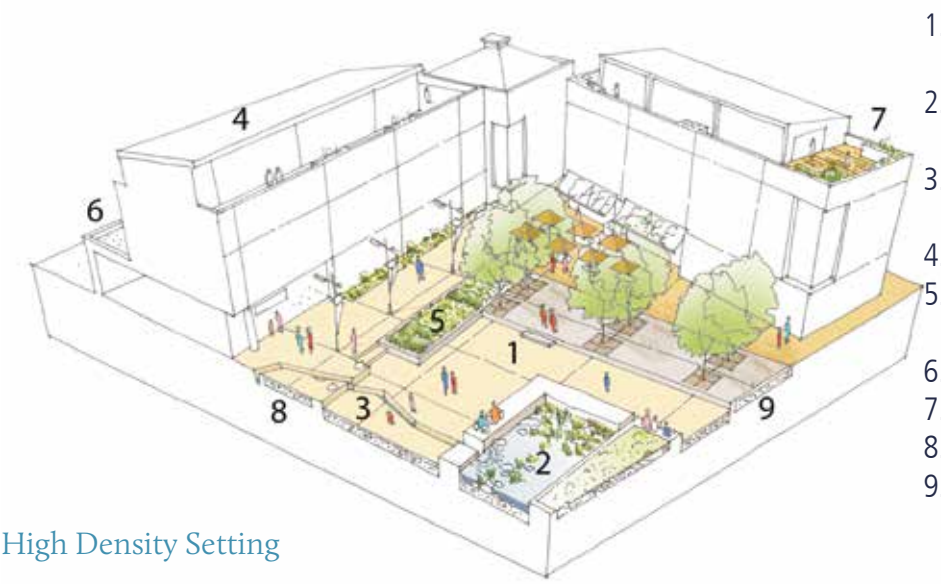
3-37. Green/brown roofs can be more cost effective than a traditional roof over the lifetime of a development. A flat roof is defined as a roof with a slope of between 0° and 10° in pitch.

3-38. The Water Framework Directive and the associated River Basin Management Plan for the Anglian region requires public bodies to have a positive impact on the quality of lakes, rivers and groundwater collectively called water bodies. The water bodies in Cambridge are currently failing to achieve the required status of 'good'. Quality refers to the quality of the water body in terms of the quality of the water itself, the quality of the shape and form of the water body and the quality of the biodiversity of the water body.

3-39. This policy seeks to ensure all surface water that is discharged to ground or into rivers, watercourses and sewers has an appropriate level of treatment to reduce the risk of diffuse pollution.

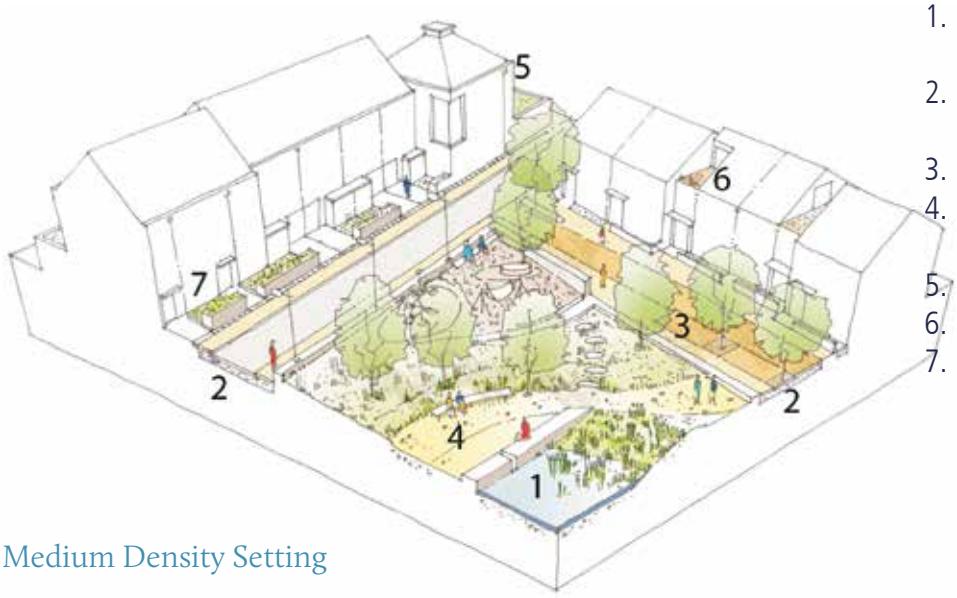
3-40. The policy also recognises that development adjacent to a water body provides an opportunity for both the development and the water body and that they should complement and enhance each other.

Figure 10 SuDs in Different Settings



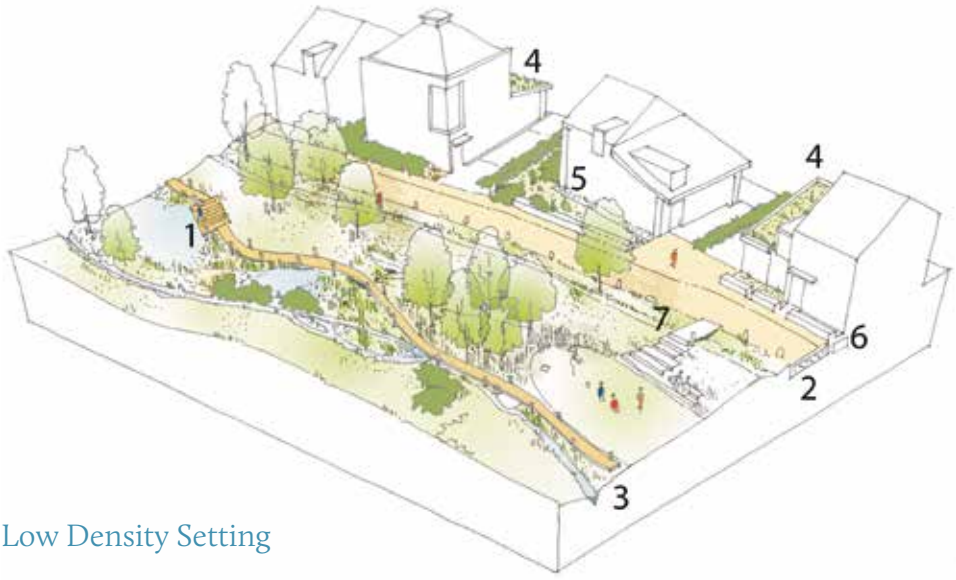
High Density Setting

1. Urban square with permeable Paving
2. Retention pond with integrated seating
3. Rill within pedestrianised Shopping Street
4. Brown roofs within town centre
5. Rain garden/planted bioretention element
6. Green Roofs
7. Roof Gardens
8. Permeable paving within street
9. Bioretention tree pits within square



Medium Density Setting

1. Filter strip and retention pond within residential square
2. Permeable paving within residential street/mews
3. Roadisde bio-retention tree pits
4. Gravel/permeable surfaces within residential square
5. Green Roofs
6. Roof Gardens
7. Rainwater collection from roofs in front gardens/water butts



Low Density Setting

Wetland area within large open space
Permeable paving within residential street/mews
Natural Waterway
Green Roofs
Rainwater collection from roofs in front gardens/water butts
Rainwater harvesting
Roadside swale

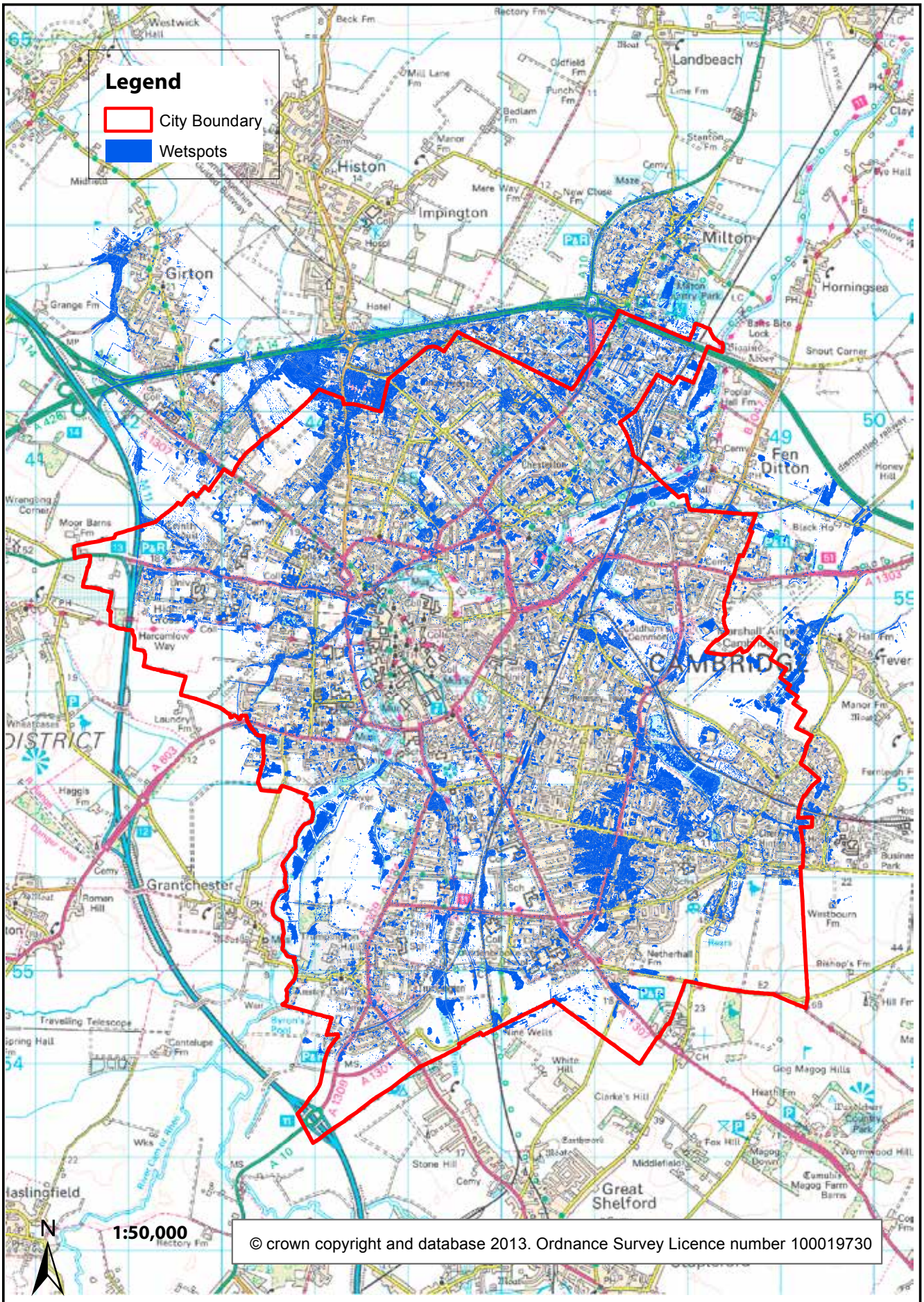


Figure 11 Wetspots (Pluvial Flood Risk)

Policy 14. Flood Risk

A. Potential flood risk from the development

Development will be permitted providing it is demonstrated that:

i. The peak rate of run-off over the development lifetime, allowing for climate change, is no greater for the developed site than it was for the undeveloped site;

ii. The post development volume of run-off, allowing for climate change over the development lifetime, is no greater than it would have been for the undeveloped site. If this cannot be achieved then the limiting discharge is 2 l/s/ha for all events up to the 100 year return period event ;

iii. The development is designed so that the flooding of property in and adjacent to the development would not occur for a 1 in 100 year event plus an allowance for climate change and in the event of local drainage system failure;

iv. The discharge locations have the capacity to receive all foul and surface water flows from the development. Including discharge by infiltration, into water bodies and into sewers;

v. There is a management and maintenance plan for the lifetime of the development. which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime; and

vi. The destination of the discharge obeys the following priority order:

a. firstly to ground via infiltration,
b. then, to a water bod,y
c. fhen, to a surface water sewer

Discharge to a foul water or combined sewer is unacceptable.

B. Potential flood risk to the development

Development will be permitted if an assessment of the flood risk is undertaken following the principles of the National Planning Policy Framework and additionally:

For an undeveloped site:

vii. If it is not located within flood zone 3b, unless it is a water compatible development and does not increase flood risk elsewhere by either displacement of flood water or interruption of flood flow routes and employs flood resilient and resistant construction including appropriate boundary treatment and has a safe means of evacuation;

viii. If it is not located within flood zone 3a, unless it is a water compatible development or minor development when the principles in a) above apply;

ix. If it is located within flood zone 2 or a surface water wetspot and employs flood resilient and resistant construction as appropriate; and

x. Floor levels are 300mm above the 1 in 100 year flood level plus an allowance for climate change where appropriate and/or 300mm above adjacent highway levels where appropriate.

For a previously developed site:

Opportunities should be taken to reduce the existing flood risk by the positioning of any development such that it does not increase flood risk elsewhere by either displacement of flood water or interruption of flood flow routes and employs flood resilient and resistant construction including appropriate boundary treatment and has a safe means of evacuation.

3-41. Both the Strategic Flood Risk Assessment and Surface Water Management Plan for Cambridge have found that without the mitigation measures outlined in this policy, developments could increase flood risk elsewhere. Flood risk assessments should make reference to the latest version of these studies. There is also an opportunity to reduce the overall flood risk in Cambridge through re-development. This policy seeks to address this with the same design standards applied to new developments on previously developed sites as undeveloped sites as this refers to the site in its natural state prior to any development taking place.

3-42. The rivers, watercourses, sewers and ground conditions throughout Cambridge have varying amounts of capacity for flow from new developments and an adequate assessment of this capacity must be undertaken to support any development proposals. This policy builds upon the standards currently being achieved in the major growth sites on the fringes of Cambridge.

3-43. The appropriate responsible bodies including The Environment Agency, Anglian Water and Cambridgeshire County Council should be consulted, as appropriate, during the initial design process for any new development or re-development.

3-44. The Great Ouse Catchment Flood Management Plan has assessed how an increase in the flow of water in rivers and watercourses due to climate change will affect Cambridge. It has concluded that flood zones will be inundated more frequently and for longer. This seeks to clarify what development would be acceptable in which flood zones. The findings of the Surface Water Management Plan for Cambridge highlights the importance of a careful consideration of the levels within a development such that if extreme events occur or there is a maintenance issue that causes the drainage system to stop working, properties will not flood, as a result of surface water (pluvial) flooding.

3-45. In flood zone 3 water maybe flowing in the general direction of the river and interruption of these flows can increase flood risk to adjacent developments. As such, careful consideration must be given to the positioning of development on site so there is no interruption of these flows is necessary in the design of a development. This should also include the consideration of boundary treatments to enable floodwater to flow with a minimum of hindrance to the flow.

Figure 12 Sustainable drainage is an integral component of Cambridge's historic environment

Public Health and Safety

Policy 15. Contaminated Land

Development will be permitted where the applicant can demonstrate that:

i. there will be no adverse health impacts to future occupiers from ground contamination resulting from exiting/previous uses of the area, and

ii. there will be no adverse impacts, from ground contamination, to the surrounding occupiers and environment, caused by the development.

Where contamination is suspected an assessment should be undertaken which identifies existing/former uses in the area that could have resulted in ground contamination; and if necessary:

iii. design and undertake an intrusive investigation to identify the risks of ground contamination, including ground gases; and if necessary

iv. adopt and implement mitigation measures, to ensure a safe development and that the site is stable and suitable to the new use in accordance with the National Planning Policy Framework; ensuring that there are no adverse health impacts to future/surrounding occupiers and which minimises impact to the environment.

Proposals for sensitive developments in an existing/former industrial area will be permitted where the uses that could result in ground contamination are identified as part of the development package.

3-46. The growth of rail infrastructure and an expanding population in the 1800s in Cambridge led to chalk quarrying, clay extraction, engineering and energy provision, through town gas production, during the industrial age. The last century has also seen considerable land filling of voids left by clay and chalk marl extraction, electronics manufacturing and engineering.

3-47. Pollution can arise from any of the activities presented above and many other sources. Land and groundwater can present a potential source of pollution if they have been contaminated by previous land uses.

3-48. Land contamination is a material consideration for the purposes of planning. It is important to ensure that proposed developments are situated on land that will be safe and suitable for the proposed use. There will be situations where remediation works will be required to make land safe prior to being developed; for example if a site's previous use was a petrol station, there will be a need to ensure that no residual fuel in storage tanks or in the soil itself is left on-site as it may cause a health hazard for future users. In some instances, the level and type of contamination of land may make it unsuitable for certain types of development, for example recently closed landfill sites are considered to be unsuitable for residential development.

3-49. On a precautionary basis, the possibility of contamination should be assumed when considering both development plans and individual planning applications in relation to all land subject to or adjacent to previous industrial use and also where uses are being considered that are particularly sensitive to contamination. Conditions shall be applied to planning permissions to secure appropriate pollution prevention or mitigation measures where required. In major developments it will also be required to demonstrate sustainable forms of managing contaminated land (mitigation measures), which reduces the need to landfill and minimises the impacts on climate change.

3-50. In the context of this policy examples of sensitive developments include housing, schools, hospitals and children's playing areas. The DOE Profiles, available for download from the Environment Agency Website , provides details on the processes and substances associated with common industrial uses.

Policy 16. Light Pollution Control

Development proposals which include new external lighting, or changes to existing external lighting will be permitted where it can be demonstrated that:-

i. it is the minimum required to undertake the task, taking into account public safety and crime prevention;

ii. upwards or intrusive light spillage is minimised;

iii. it minimises impact to residential amenity, and

iv. it minimises impact to wildlife and landscape, character particularly at sites on the edge of the City.

Developments of major sites will be required to submit an assessment of the impact on any sensitive residential premises both on and off site.

3-51. The lighting of new developments must be carefully designed to ensure that areas are appropriately lit, whilst avoiding or minimising light pollution. Excessive lighting reduces the visibility of the night sky, is a waste of energy and can harm residential amenity by disturbing people's sleep. It can also disturb wildlife and be visually intrusive in the landscape. Details of the proposed lighting scheme should be in line with the latest nationally accepted guidance available at the time of the application and submitted with the planning application. Lights should be carefully selected and sited for their purpose, directed only onto the area where they are needed, and where necessary shielded by way of appropriate landscaping. Particular care will need to be taken with floodlighting of sports pitches. Where appropriate, conditions will be used to control lighting, including limiting the hours of illumination.

3-52. The City council supports the lighting of landmark buildings and public spaces in line with this strategy, where it is carried out in a sensitive way avoiding light spillage.

Policy 17. Protection of Human Health from Noise and Vibration

Development will be permitted where it is demonstrated that it will not lead to significant adverse effects, including cumulative effects, on health and amenity from noise and vibration: or that significant adverse effects can be minimised through appropriate reduction and/or mitigation measures (prevention through design is preferable to mitigation).

Developers of major sites and sites which include noise sensitive development located close to existing noise sources shall provide a noise assessment in accordance with Tables 4 below also taking in account the latest nationally and internationally accepted guidance available at the time of the application. Proposals that are sensitive to noise and located close to existing noise sources, will be permitted where adequate noise mitigation measures are provided as part of the development package.

Development of sites that include noisy activities or plant or activities that operate at unsocial hours shall provide a noise assessment based on current national and international guidance available at the time of the application.

3-53. Noise not only causes annoyance, but can also cause serious disturbance such as the loss of sleep. Research by the World Health Organisation (WHO) has also shown noise to cause measurable health affects. Some aspects of noise is covered other legal controls such as nuisance law. these controls cannot meet the aim of the planning system, which is the protection of amenity and the test of 'statutory nuisance' is a much higher bar than 'unacceptable harm'. Neither do they include the impact from transport related noise on development. Therefore noise is a material planning consideration. However, it is not the role of the Local Plan to prevent all forms of development that may result in some measure of noise, but rather to control development that may have significant adverse effects. The Plan does not seek to duplicate the statutory nuisance and noise controls provided by other legislation.

3-54. This policy relates to noise from all potential sources and protects amenity, particularly to noise sensitive receptors including receptors living and working in Cambridge City. It will also aim to protect any 'Quiet Areas' that may be identified in the future under the Environmental Noise (England) Regulations 2006.

3-55. For the purposes of the above noise includes vibration.

Policy 18. Air Quality, Odour and Dust

A. Development will be permitted where it can be demonstrated that it does not lead to significant adverse effects on health, the environment or amenity from polluting or malodorous odour emissions, or dust or smoke emissions to air; or

B. where a development is a sensitive end use, that there will not be any significant adverse effects on health, the environment or amenity arising from existing poor air quality, sources of odour or other emissions to air.

Specifically applicants, where reasonable and proportionate, according to the end use and nature of the area and application, must demonstrate that:

- **i.** there is no adverse affect on air quality in an Air Quality Management Area;
- **ii.** pollution levels within the Air Quality Management Area will not have a significant adverse effect on the proposed use/users;
- **iii.** the development will not lead to the declaration of a new Air Quality Management Area;
- **iv.** the development will not interfere with the implementation of the current Air Quality Action plan;
- **v.** any sources of emissions to air, odours. dusts and smoke generated by the development are adequately mitigated so as not to lead to loss of amenity for existing and future occupants and land uses.
- **vi.** any impacts on the proposed use from existing poor air quality, odour and emissions are appropriately mitigated.

3-56. Pollution to air can arise from many sources and activities including traffic and transport, industrial processes, commercial premises, energy generation, agriculture, waste storage/treatment and construction sites. This policy relates to air pollution from all potential sources, in any potential form and includes dust, fumes and odour.

3-57. The primary local impacts on air quality on Cambridge are from road transports and domestic, commercial and industrial heating sources such that an Air Quality Management Area was designated in the central part of the city in August 2004. Pollution to air can also arise from industrial processes, commercial premises, energy generation, agriculture, waste storage/treatment and construction sites. Despite increasing economic activity and consequent population increases, the application of air quality management and transport policy has not led to an increase in air pollution in Cambridge. It is important to ensure that development proposals continue to contribute to and enhance the natural and local environment throughout their lifetime.

3-58. Applicants shall, where reasonable and proportionate, prepare and submit with their application, a relevant assessment, taking into account guidance current at the time of the application. The criteria for requiring a Dust Risk Assessment/Management and/or an Air Quality Assessment are set out in the Air Quality in Cambridge Developers Guide. Some applications may require appropriate pollution prevention or mitigation measures to be acceptable. Some development may also require a permit under the Pollution Prevention and Control Act 1999.

Table 5 Noise Exposure Categories

NEC	
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	Planning permission should not normally be granted. Where it is considered thatpermission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of rotection against noise.
D	Planning permission should be refused.

A recommended range of noise levels is given below for each of the NECs for dwellings exposed to noise from road, rail, air, and "mixed sources".

The NEC noise levels should not be used for assessing the impact of industrial noise on proposed residential development because the nature of this type of noise, and local circumstances, may necessitate individual assessment and because there is insufficient information on people's response to industrial noise to allow detailed guidance to be given.

However, at a mixed noise site where industrial noise is present but not dominant, its contribution should be included in the noise level used to establish the appropriate NEC.

The NEC procedure is only applicable where consideration is being given to introducing residential development into an area with an existing noise source, rather than the reverse.

Noise Levels Corresponding to the Noise Exposure Categories for New Dwellings $L_{Aeq,T}$ dB				
Noise Exposure Category				
Noise Source	A	B	C	D
Road Traffic				
0.700-23.00	<55	55 - 63	63 - 72	>72
23.00-0.700[1]	<45	45 - 57	57 - 66	>66
Rail Traffic				
0.700-23.00	<55	55 - 66	66 - 74	>74
23.00-0.700[2]	<45	45 - 59	59 - 66	>66
Air Traffic[3]				
0.700-23.00	<55	57 - 66	66 - 72	>72
23.00-0.700	<48	48 - 57	57 - 66	>66
Mixed Sources				
0.700-23.00	<55	55 - 63	63 - 72	>72
23.00-0.700[1]	<45	45 - 57	57 - 66	>66

Notes:

Noise levels: the noise level(s) (L_{Aeq},T)used when deciding the NEC of a site should be representative of typical conditions.

[1]Night-time noise levels (23.00 - 07.00): sites where individual noise events regularly exceed 82 dB L_{Amax} (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the L_{Aeq},8h (except where the L_{Aeq},8h already puts the site in NEC D).

[2]Aircraft noise: daytime values accord with the contour values adopted by the Department for Transport which relate to levels measured 1.2m above open ground. For the same amount of noise energy, contour values can be up to 2 dB(A) higher than those of other sources because of ground reflection effects.

[3]Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant.

To check if any individual noise source is dominant (for the purposes of this assessment) the noise level from the individual sources should be determined and then combined by decibel addition (remembering first to subtract 2 dB (A) from any aircraft noise contour values). If the level of any one source then lies within 2 dB(A) of the calculated combined value, that source should be taken as the dominant one and the site assessed against the appropriate NEC for that source, rather than using the "mixed source" NECs. If the contribution of the individual noise sources to the overall noise level cannot be determined by measurement and/or calculation, then the overall measured level should be used and the site assessed against the NECs for "mixed sources".

These standards are taken from the former PPS24 on Noise.