

A stylized, light brown map of North West Cambridge is positioned on the left side of the image, partially overlapping the light blue background. The map shows the irregular coastline and internal land features of the area.

NORTH WEST **cambridge**

Sustainability Statement
September 2011

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North West Cambridge – The Vision

The University of Cambridge (“the Applicant”) is committed to creating a successful, sustainable, mixed-use community through the proposed development at the North West Cambridge site (“the Application Site”) (“the Proposed Development”). The result will be a significant addition to the city in terms of housing, employment and research accommodation, public amenities, and open space, merging the Proposed Development with the fabric and community of the existing city. This will be achieved not only by integrating the extension with the existing city and adjacent occupiers, but also by thinking about provision of a range of amenities and facilities within the Application Site that will meet the needs of this community long into the future. The Proposed Development will be differentiated from other urban extensions by the various University uses that will be co-located on the Application Site and the long-term interest of the Applicant in the management of the Proposed Development, and both of these will provide a rich fabric of ‘city life’ within the locality that will help it to achieve its sustainable aspirations.

The City of Cambridge is unusual in many ways, in particular having been shaped by the University over the last 800 years. This clear sense of the city’s history is an important aspect of Cambridge’s character and, in order to be successful, it is important that the Proposed Development makes a positive contribution to the existing fabric of the city and is sensitive to it. The following terms describe aspects which may be perceived through living and working in the city:

<i>Heritage</i>	<i>Education</i>	<i>Cultured</i>
<i>Landmarks</i>	<i>Cycling</i>	
<i>Quality</i>	<i>Affluence</i>	<i>Strong communities</i>
<i>Manicured</i>	<i>Skyline</i>	
<i>Pride</i>	<i>Mixed communities</i>	<i>Innovation</i>
<i>Vernacular</i>	<i>Open space</i>	

Some of these characteristics have grown organically with the City, and whilst not all can be “designed” into the Application Site, the initial site design and ongoing interaction with residents and employees can facilitate their establishment. Other factors can be incorporated into the infrastructure and buildings through the design, layout, and construction of the Application Site.

Education is one of the principal activities of the Applicant and is a defining feature of the Proposed Development. The provision of housing for both students and staff, and of new academic teaching and research departments will play a central role in the future expansion of education in the City. The

design of the Proposed Development will encourage and stimulate new ideas and learning through the provision of work space and leisure space which encourages interaction between staff and students, and academia and commercial research, and helps develop a community in which new ideas can flourish. The design of buildings, open space, and the provision of community facilities will provide opportunities for people to meet and interact, enabling the site to become a centre for learning and research rather than a dormitory campus.

The Proposed Development will also promote education through being a living demonstration of a sustainable community, or a ‘living experiment’ for ongoing research and monitoring. New and innovative technologies and systems will be on-show for residents and visitors to explore, supported by easily accessible information and open days. For example, energy and drainage infrastructure will be displayed in some areas for people to view. These could be linked to a public art strategy enabling residents to both learn and enjoy looking at these features. Opportunities will also be taken to provide linkages between University research and the Proposed Development, in particular the monitoring of resource use (energy, waste, water etc) across the Application Site.

Promoting social interaction is vital to the success of a community and the intention is for the Proposed Development to be a “sharing” development where there is a sense of community cohesion and sharing of facilities. The Proposed Development will attract a variety of residents, from long-term private home owners, to University and College staff (including academic, research and support staff) and postgraduate students. The facilities provided on site, transport infrastructure, and support services will encourage social and community groups to be established, and enable cultural activities to be held on-site. For example, the establishment of a community intranet will help to facilitate social activities and car sharing. The community facilities can also be used for hosting groups from the wider community such as the Scouts. Some of the academic facilities may include suitable space which can be used for concerts and theatrical productions, linked to more established Cambridge venues to encourage arts to flourish at the Proposed Development and attracting the City residents as well.

Introduction

This Sustainability Statement conveys the sustainability strategy for the Proposed Development, providing examples of how the Application Site will meet the high sustainability aspirations of the Applicant.

Sustainability

Sustainability is forming an ever more important role in the way our towns and cities are planned as the case for reducing our impact on the environment becomes stronger. The term sustainability has been defined in a number of ways, but perhaps the best known is:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

(Brundtland Commission 1987)

So in order to be truly sustainable the development of the Application Site being proposed by the University of Cambridge needs to be able to meet the needs of current generations without adversely impacting future generations. This means consideration of not just the physical design and fabric of the buildings and infrastructure, but also the creation of a viable and successful community. The 800 year history of the University of Cambridge sets an important precedent and developing a long term vision with the means to deliver it is one of the defining aspects of the development proposals. Flexibility of buildings and infrastructure designed to adapt to the needs of future residents and users of the Application Site is a guiding principle.

The Area Action Plan for the Application Site contains a number of policy drivers relating to sustainability. This is in addition to emerging National policy and regulations which are increasingly aimed at reducing CO₂ emissions from buildings and activities, and improving the sustainability of developments. For these reasons the Applicant has expressed its desire to see the Proposed Development as an exemplar of sustainable development, demonstrating how a large mixed development can be delivered commercially whilst meeting high sustainability standards.

Sustainability is fundamental to current Government policy. Recent government announcements in the context of the Localism Bill and the emerging draft National Planning Policy Framework make it clear that there is a presumption in favour of sustainable development at the heart of the planning system which should be central to the approach taken to both plan making and decision taking.

This report provides a summary of how the design of the Proposed Development may deliver the aspirations for sustainable development. It is structured around thirteen “sustainability principles” describing how the design responds to these principles, and examples of measures which are proposed

or will be considered during the detailed design. The report also highlights how the Proposed Development can meet requirements to achieve high scores in environmental rating schemes - the Code for Sustainable Homes (Code) and the Building Research Establishment Environmental Assessment Method (BREEAM).

During the next stages of the design, the proposals in this statement will be examined in more detail and proposals will be included in the final design where they demonstrate a positive sustainable benefit, and where they are technically and financially viable.

The information presented in this statement is based on a large variety of detailed technical documents and design proposals. These documents are referenced and are submitted as part of the planning application. They should be referred to for more detailed information.

What isn’t proposed?

There are many measures which can be taken to improve the sustainability of a site but it is not possible to incorporate all of them. There are many reasons for this including:

- Some measures may not be appropriate for the type and scale of the Proposed Development.
- There can be conflicts between different measures.
- The measure may not be viable or deliverable at this location.
- Some measures are not appropriate for consideration at outline planning and will be examined as the design progresses.

This report lists both examples of measures which may be included in the Proposed Development, and also of measures which have been assessed and as a result of a range of factors, are not currently being considered further.

This statement has been developed to accompany the application for planning permission and detailed proposals will continue to be refined in tandem with the Proposed Development itself over the coming years for each phase. Therefore this statement gives an outline of what is considered. Many measures will be examined in more detail as the design progresses.

Setting a sustainability framework

The framework for the Proposed Development is set by the Area Action Plan (AAP), adopted by Cambridge City and South Cambridgeshire District Councils in 2009. The first policy states:

North West Cambridge will create a new University quarter, which will contribute to meeting the needs of the wider city community, and which will embody best practice in environmental sustainability

(NW1: Vision)

In this section, we examine the main legal and policy drivers for sustainability on the Proposed Development. Further detail is provided in the Policy Review in Appendix 3 which provides descriptions of the local and national policy, and environmental rating schemes such as the Code for Sustainable Homes and BREEAM.

Legal Drivers

The challenge of climate change and the need to stabilise CO₂ levels in the atmosphere whilst enabling sufficient growth to support the UK’s growing population has intensified. There is now a comprehensive range of legislation and policy at various scales which supports the design and implementation of measures and approaches to ensure new development is sustainable and ‘low carbon’ as a result of energy efficiency measures and appropriate selection of energy sources.

National Legislation

The UK **Climate Change Act (2008)** sets a legally binding target for reducing UK CO₂ emissions by at least 80% by 2050. The Act is supported by the **UK Low Carbon Transition Plan (2009)**, which sets out the UK’s approach to meeting our carbon reduction commitments. Most recently, the Government has accepted the Committee on Climate Change’s 4th carbon budget recommendations which cover the period 2022 – 2027. These set a CO₂ reduction target in law of 50% reduction by 2027 from 2050 levels.

The **Building Regulations Part L** which set maximum limits for CO₂ emissions from buildings and provide minimum efficiency standards for fabric and building services are revised every few years to become more stringent. The trajectory for further revisions to the Part L (including the recently introduced 2010 version) was set in the consultation “Building a Greener Future: Towards Zero Carbon development” which leads to all new homes being designed to be ‘zero carbon’ from 2016. Non domestic buildings will become zero carbon by 2019.

Floods and Water Management Act 2010. The aim of the Act is to provide better, more comprehensive management of flood risk for people, homes and businesses.

The **Localism Bill** currently before Parliament introduces the proposed National Planning Policy Framework which, in turn, places sustainable development at the heart of both planning policy and decision taking by creating a presumption in favour of sustainable development.

National Planning Policy

The main national planning policies in relation to climate change and sustainable development are summarised below:

- **Planning Policy Statement 1: Delivering Sustainable Development, January 2005.** The PPS sets out three objectives for the planning system: sustainable development; spatial planning; and community engagement.
- **Planning Policy Statement: Planning and Climate Change Supplement to PPS 1, December 2007.** The supplement to PPS1 expects new development to consider its environmental performance and take particular account of the climatic changes likely to be experienced over its expected lifetime.
- **Draft PPS: Planning for a Low Carbon Future in a Changing Climate.** A draft replacement for PPS 22 and the PPS 1 Supplement on Planning and Climate Change was published for consultation on 9th March 2010. The draft PPS represents an evolution in the way planning deals with climate change and focuses strongly on the role of district heating in helping to reduce urban CO₂ emissions as well as designing in adaptive measures to ensure resilience to the impacts of climate change.
- **Planning Policy Statement 22: Renewable Energy, August 2004.** PPS 22 sets out the UK’s policies for renewable energy, which planning authorities should have regard to when making planning decisions.
- **Planning Policy Statement 25: Development and Flood Risk, December 2006.** PPS25 outlines the UK’s approach on development and flood risk, and seeks to ensure that flood risk is taken into account at all stages in the planning process.
- **UK Waste Strategy for England 2007.** Produced by Defra, this and other UK policy, legislation and regulations result in obligations on local authorities and on businesses to manage and handle waste more safely and sustainably.
- **Planning Policy Statement 10: Planning for Sustainable Waste Management, July 2005.** The key objective of PPS 10 is to protect human health and the environment by producing less waste and by using it as a resource wherever possible.
- **Planning Policy Statement 9: Biodiversity and Geological Conservation, August 2005.** This guidance sets out planning policies on

protection of biodiversity and geological conservation through the planning system.

- **Draft Planning Policy Statement: Planning Natural and Healthy Environments, March 2010.** This is a consultation document on a new planning policy statement on planning for the natural environment, green infrastructure, open space, sport, recreation and play.
- **Planning Policy Statement 23: Planning and Pollution Control, November 2004.** PPS23 is intended to complement the new pollution control framework under the *Pollution Prevention and Control Act 1999* and the *PPC Regulations 2000*.
- **Planning Policy Statement 5: Planning for the Historic Environment, March 2010.** This PPS sets out the role planning and new development have in conserving our heritage assets and historic environments whilst delivering sustainable development and addressing climate change.
- **Planning Policy Guidance 13: Transport, April 2001.** The emphasis in PPG 13 is the integration of transport and land use planning. The aim is to reduce growth in the length and number of motorised journeys, encourage alternative means of travel which have less environmental impact and reduce reliance on the private car.
- **Planning Policy Statement 3: Housing, June 2011.** PPS3 sets out the national planning policy framework for delivering the UK’s housing objectives. The main emphasis of the PPS is the design and delivery of high quality new housing which contributes to the creation of sustainable, mixed communities across the wider local authority area as well as at neighbourhood level.
- Draft National Planning Policy Framework (July 2011)

This is the consultation version of the NPPF that will set out the Government’s economic, environmental and social planning policies for England replacing current national planning policy. Taken together, the policies in the NPPF articulate the Government’s vision of sustainable development, which should be interpreted and applied locally to meet local aspirations. As indicated above, at the heart of the NPPF is to be the presumption in favour of sustainable development. .

Regional Policy

It should be noted that with the change of Government in May 2010, regional powers are in the process of being abolished which will probably result in the removal of regional level policy relating to planning and development. However planning policy under the previous Government informed the preparation of the AAP which is the principal planning guidance. See appendix for more details.

Local Policy Drivers

North West Area Action Plan

The main local policy guiding the application proposals of the Proposed Development is the Area Action Plan (AAP) Development Plan Document which was adopted in October 2009.

The AAP sets challenging targets for sustainability in its NW1 policy and this vision continues throughout the document. The main objectives of the AAP are:

- b) To create a sustainable community*
- c) To make the best use of energy and other natural resources, to be built as an exemplar of sustainable living with low carbon and greenhouse gas emissions and be able to accommodate the impacts of climate change.*

(NW1 objectives)

Many of the policies within the AAP set requirements for sustainability measures to be incorporated into the Proposed Development .

These include:

Urban design:

- Policy NW4: Site and Setting
- Policy NW7: Balanced and Sustainable Communities
- Policy NW20: Provision of Community Services and Facilities, Arts and Culture.
- Policy NW21: A Local Centre

Transportation:

- Policy NW11: Sustainable Travel
- Policy NW14: Madingley Road to Huntingdon Road Link
- Policy NW16: Public Transport Provision
- Policy NW17: Cycling Provision
- Policy NW18: Walking Provision
- Policy NW19: Parking Standards

Surface water drainage:

- Policy NW25: Surface Water Drainage

Energy and CO₂ emissions:

- Policy NW24: Climate Change & Sustainable Design and Construction

Construction and waste:

- Policy NW28: Construction Process

Relevant AAP policies are referenced throughout this report to demonstrate how the application proposals address the requirements.

Other local policy and guidance

The AAP is the local policy document which guides the Proposed Development.

However a further document which can be used as additional guidance is the Cambridge City Council ‘Sustainable Design and Construction’ Supplementary Planning Document (SPD) adopted in June 2007.

This document lays down the principles of sustainable design in the context of Cambridge and provides design advice on how these can be met. The document is split into ‘essential’ considerations, and ‘recommended’ considerations, the latter being applicable for large sites.

In this sustainability statement, the relevant elements of the Sustainable Design and Construction SPD and sustainability checklist are referenced in each section to show how the relevant issues have been addressed.

Environmental assessment methodologies

Policy NW24 of the AAP requires Code for Sustainable Homes Level 5 to be achieved for most dwellings and BREEAM Excellent for all non-domestic buildings.

Code for Sustainable Homes

The Code for Sustainable Homes is an environmental assessment system for new housing in England which was introduced in April 2007 based on BRE’s EcoHomes scheme. The Code assesses a development against a set of criteria under nine key categories and awards a rating to each dwelling type based on a scale of level one to six; the rating depends on whether the dwellings meet a set of mandatory standards for each level, as well as an overall score.

Mandatory requirements exist under the following credits:

- Energy and CO₂
- Water
- Embodied Impacts of Construction Materials;
- Surface Water run-off;
- Construction Site Waste Management;
- Household Waste Storage Space and Facilities.

All homes on the Proposed Development are required by the AAP to meet Code level 5 or above (apart from the first 50 units if built before 2013). Perhaps the most demanding component of meeting this is achieving the mandatory CO₂ emission credits which equate to ‘zero carbon’ regulatory loads for Code level 5.

The Code has recently been amended (November 2010) following public consultation and engagement with industry and other stakeholders. The main amendments include aligning the Code energy section with Part L of the Building Regulations, and the introduction of minimum ‘Fabric Energy Efficiency Standards’ (FEES) for different dwelling types. Some credit issues have been removed, replaced or updated, consequently affecting the number of credits allocated.

BREEAM

The Building Research Establishment Environmental Assessment Method (BREEAM) is similar to the Code in that it provides an overall rating for a building based on performance against different credits. Ratings are given from Pass to Outstanding. BREEAM is the most established assessment scheme for non-domestic buildings in the UK although there are other schemes available with a similar assessment and credit structure which are also used in the UK.

The AAP requires all non domestic buildings to achieve a BREEAM rating of Excellent. This will impose constraints on maximum CO₂ emissions and other constraints where the achievement of credits is either mandatory or a minimum standard must be attained.

Referencing in this report

In each section of this report, a short summary of the policy and standards which are addressed is given, allowing a simple cross reference between requirements and design response.

These references cover:

- The Area Action Plan
- The Cambridge City Sustainable Design and Construction SPD
- The Code for Sustainable Homes (Code)
- BREEAM

Sustainability principles

Setting sustainability principles

Sustainability principles have been used to guide the design and development of the sustainability strategy for the Proposed Development. These are based on the BioRegional “One Planet Living” principles which are internationally recognised as a way of guiding sustainable development. They were developed further for the 2012 Olympic Games in London as laid out in the Olympic Delivery Authority Sustainable Development Strategy.

The principles modified for the Application Site drive sustainability in the following areas:

1. Energy and carbon dioxide emissions
2. Water
3. Food
4. Waste
5. Materials and construction
6. Biodiversity and ecology
7. Pollution
8. Global, local and internal environments
9. Culture, heritage and built form
10. Transport and mobility
11. Housing, amenity, and well-being
12. Education and employment
13. Inclusion



Illustrative masterplan of the Proposed Development showing indicative building layout and massing.

Principle 1: Energy and CO₂ emissions

Reduce the carbon footprint of the Proposed Development through the effective use of energy efficiency (‘be mean’), the supply of energy from highly efficient sources (‘be lean’) and the use of energy from renewable sources (‘be green’).

Achieving high performance standards for all of the buildings, as measured by the Code and BREEAM, will require substantial carbon savings over current Part L of the Building Regulations meaning that the buildings will include high levels of energy efficiency and incorporate low and zero carbon sources of energy. All houses and flats built after 2016 will be Zero Carbon through a combination of energy efficiency, on-site renewable energy and investment in off-site carbon mitigation schemes. All buildings will be highly insulated and airtight to minimise space heating demands.

The parameters for the detailed layout of the Proposed Development have been designed to allow buildings to be well orientated where practicable. Houses and flats will generally have larger areas of south facing windows to increase wintertime sun access. Commercial and academic buildings will have larger areas of north facing windows to reduce the risk of summertime overheating.

Adequate space will be provided between buildings to allow good levels of daylight to penetrate throughout, reducing the use of electric lighting, and providing a comfortable internal environment for occupants.

Most roofs will feature arrays of photovoltaic or solar thermal panels. The higher rise buildings within the higher density local centre of the Application Site will have a communal heating system supplied by a distribution main taking waste heat from on-site electrical generation. This highly efficient combined heat and power system (CHP) built in the early phases of the Proposed Development will be a feature of the neighbourhood centre and used to inform residents and visitors about sustainable energy. A communal cooling system connected to some academic and commercial buildings may also enable efficient cooling systems to be used with the opportunity for capturing waste heat for use to meet heating demands.

Flexibility will be central to the energy strategy. Although the combined heat and power system will be based on natural gas initially, centralising all the plant in one place means that the fuel can be most easily substituted as availability/preferences change in the years to come. The parameter plans include (for contextual rather than approval purposes) the potential for a future Energy Centre in the North West corner of the Application Site, which could be powered by a renewable fuel, and which could be linked to a larger scale district heating system covering areas outside the Proposed Development.

The measurement of energy and CO₂ emissions will feature strongly in the ongoing educational and research aspects of the Proposed Development, with on-going monitoring and collection of data. This will be used by the

Applicant for future research into sustainable communities and development practices. In addition, it will enable the education of residents through energy displays and smart meters, allowing them to compare their consumption with the average via the community website, and allowing them to see how much less energy they use than “typical” UK households.

Examples of measures considered:

- Rooftop photovoltaic arrays and / or solar thermal systems are proposed
- District heating in higher density areas and potentially medium density areas is proposed providing heat to dwellings, University and commercial buildings.
- Gas-fired combined heat and power (CHP) is proposed to provide low carbon heat to the energy supply network.
- Centralised cooling network connected to some academic and commercial buildings allowing waste heat to be captured from cooling plant for use in the energy supply network.
- An Energy Centre (central plant room) which aims to educate and inspire visitors through high quality architecture and design, and which houses and displays the CHP plant.
- Solar thermal systems in areas which are not supplied by the district heating/energy supply network.
- High standards of energy efficiency in domestic and non-domestic buildings with high levels of insulation and air-tight construction.
- Southerly orientation of dwellings to capture solar gains in winter for free heating, and reduce overheating in summer.
- Zero carbon achieved through on-site generation and use of off-set mechanisms.

What isn’t currently being considered and why:

- Wind turbines. There is insufficient space on the site for large scale wind turbines, and smaller turbines will make a negligible contribution to the site’s energy and CO₂ reduction.
- Wood fuel biomass district heating or biomass-fired CHP. There are very limited supplies of biomass fuels without importing them from abroad and it is likely that by the time the Proposed Development is built, there will be virtually no available local resource. This presents a number of unknowns at the current stage and the situation will be monitored into the future. There are also difficulties with incorporating a biomass CHP system for a phased site like this in the shorter term.
- Zero carbon on-site. It would be technically difficult and uneconomic to incorporate enough low and zero carbon energy generation technology on site to offset all the site’s CO₂ emissions. Investing in off-site CO₂ savings

- is more cost effective, resulting in greater CO₂ savings being achievable for the same cost.
- Connection of district heating to neighbouring sites. There are no direct benefits with the current energy strategy of connecting to neighbouring sites, but the strategy is flexible to this in the future with the potential for a phased expansion.
 - Anaerobic digestion. The amount of waste generated on site would result in relatively small amounts of energy generation from an anaerobic digestion scheme.
 - Passive design with zero space heating. Designing buildings to be passive (for example no space heating) will provide a relatively small reduction in energy demand over the current proposals, but have large implications on the site design and cost through strict orientation requirements and the use of expensive technologies such as heat recovery systems.

National Policy
<ul style="list-style-type: none">• PPS 1: Delivering Sustainable Development• PPS 1 Supplement: Planning and Climate Change• Draft PPS: Planning for a Low Carbon Future in a Changing Climate• PPS 22. Renewable Energy• Draft National Planning Policy Framework
Local Policy
<ul style="list-style-type: none">• AAP NW24: Climate Change and Sustainable Design and Construction. Sections 2a, 2b, 3d, 3e, 4.
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">• SPD section 2.4: Energy
Code for Sustainable Homes
<ul style="list-style-type: none">• Energy credits
BREEAM
<ul style="list-style-type: none">• Energy credits
References
<ul style="list-style-type: none">• North West Cambridge Carbon Reduction Strategy, Parts A and B. AECOM.• Sustainability Statement Appendix 1: Climate Change Adaptation. AECOM.



Brise soleil and chimneys using the stack effect can help reduce over heating in summer. Design features such as these will be considered at the Proposed Development.



Roof-mounted photovoltaic systems will be used on both domestic and commercial buildings to provide renewable electricity.

Principle 2: Water

Ensure that freshwater consumption at the Proposed Development is reduced through water efficiency and the collection and recycling of rain water and waste water.

The East of England has the lowest rainfall in the country and is described officially as semi-arid. A high proportion of the available water resource is already being exploited and as such, even allowing for the impacts of climate change, careful management of water resources will be crucial if the economic potential of the Cambridge Sub-Region is to continue to be realised.

(NW AAP 9.11)

In the domestic sector, the Proposed Development will aim to reduce average potable water consumption to 80 litres per person per day, almost half of the UK average. This is in line with Code level 5 and 6 requirements. This will be achieved through a combination of efficient water fittings, and the collection of rainwater and recycling of greywater. In higher density areas, rainwater and greywater recycling schemes will be on a communal basis, with individual systems used in the lower density areas.

Academic and commercial buildings will incorporate water efficient fittings in line with BREEAM standards, and make use of rainwater and greywater recycling. The use of green leases (see section on Delivery) would increase the likelihood that water consumption is considered throughout the life of the occupied buildings.

Large areas of the Proposed Development will be landscaped. The landscape strategy will be developed to be as drought resistant as possible. Plant species should be predominantly native to promote biodiversity. Drought resistance will come from good stock choice, the correct planting practices and good initial aftercare during establishment. Irrigation water will be sourced from non-potable sources where practicable.

Domestic water consumption may be measured using smart meters with the information collected centrally for research purposes. Residents could also be able to view their information on the community website and, if they register, to compare it with that of other users.

Examples of measures considered:

- High efficiency water fittings including aerated shower heads and taps (also helping to reduce hot water demand), dual flush toilets, and low water consumption appliances where provided for both key worker and market housing.
- Potable water consumption in dwellings will aim to average 80 litres per person per day.
- Rainwater collection taking water from roofs and filtering and storing it in underground tanks for non-potable demands, such as WCs. Systems may be communal for higher density areas, with individual systems for detached houses and larger commercial and academic buildings.
- Greywater collection and recycling for use in non-potable demands. A series of storage tanks combined with filtering and treatment stages will be incorporated across the site, with communal systems in higher density areas.
- Green leases will increase the likelihood that that all tenants will continue to behave in a water efficient manner.
- Water for irrigation of communal landscaping will be supplied from rainwater or greywater. Rainwater butts will be provided in domestic gardens.
- Smart water meters for most buildings to allow central collection of data and comparison.

What isn’t currently being considered and why:

- Self sufficiency in water. The number of residents and buildings on the Application Site means that self sufficiency in water is not achievable. Mains water comes from a much larger catchment area including the surrounding rural area.
- Bore holes. The Catchment Management Strategy (CAMS) shows that all water resources in the Cambridge Area are either over licensed or over abstracted; therefore it is unlikely to be feasible to develop a new water resource for the Application Site.
- On-site black water treatment including reed-bed filtration. The Proposed Development will be linked to the mains sewer system. Processing and treatment of black water at a large scale off-site can be more efficient than on-site at a smaller scale, and enables the use of energy recovery with anaerobic digestion at the water treatment works.

National Policy
<ul style="list-style-type: none">• PPS 1: Delivering Sustainable development• PPS 1 Supplement: Planning and Climate Change• Draft PPS: Planning for a Low Carbon Future in a Changing Climate
Local Policy
<ul style="list-style-type: none">• AAP NW24: Climate Change and Sustainable Design and Construction. Sections 2a, 2c, 3f, 3g, 4.• AAP NW25 Surface Water Drainage
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">• SPD section 3.2: Water
Code for Sustainable Homes
<ul style="list-style-type: none">• Water credits
BREEAM
<ul style="list-style-type: none">• Water credits
References
<ul style="list-style-type: none">• Utilities and Services Assessment, Environmental Statement. Scott Wilson• Hyrdology, Drainage and Flood Risk Assessment. Environmental Statement. Scott Wilson• Sustainability Statement Appendix 1: Climate Change Adaptation. AECOM.



Rainwater harvesting can reduce the demand for potable water. Rain water is stored in tanks underground for use in non-potable demands. (Image – Aquality)



Waste water at the Application Site, will not simply go “down the drain”, but will be collected and recycled in greywater recycling systems. This can then be re-used in non-potable demands to reduce potable water consumption.

Principle 3: Food

Reduce the ecological footprint of the consumption of food, and increase local employment and business opportunities for food production

Food forms a large part of a typical person’s carbon footprint, through its growth, processing, transportation, retail, and packaging. As food becomes more of a national and international commodity the environmental effects generally increase. However, there is an increasing interest in local sustainable food production enabling people to know how and where food is produced and reducing “food miles”.

The environmental effect of food consumption at the Proposed Development is largely outside the control of the Applicant, but the proposals will provide a variety of opportunities to reduce any negative effects.

The landscaping will be used to provide food through fruit trees concentrated in specific areas, and allotments [] for residents to grow their own produce. Dwellings without gardens will be provided with window boxes or tubs.

The local centre will be available to be used for hosting farmers markets and food fairs aimed at local producers and suppliers. The food store in the local centre will also be encouraged to support these schemes, and to promote local food sales itself.

On-site catering facilities in the hotel, school, and departments will be encouraged to source local produce, potentially from the site gardens, through green leases.

Information will be provided to residents on local food provision including organic box schemes, and it is intended that a collection facility may be developed for boxes to be stored until residents return home from work.

Examples of measures considered:

- Fruit trees in communal gardens and orchards for residents to pick and share.
- [Allotments made available to NWC residents.
- The possible use of selected green spaces for community food production.
- Space within the local centre will be made available for hosting regular farmers markets which would provide local food suppliers with a regular market. There will also be opportunities for food grown on-site to be sold here with the potential for an on-site food cooperative set up through a community body.
- Local food (including that grown on-site) can be used by all of the catering facilities including the school, hotel, and academic and commercial buildings. This can be encouraged through the use of green leases and education.
- Food growing at the school, if possible, could allow school children to take part in growing and eating their own food.
- Information will be provided to residents on the availability of local food, and potential suppliers including organic box companies. A collection facility for organic boxes could provide somewhere safe and cool for delivery of boxes until residents return from work/studies to pick them up.
- The food store could be encouraged to support locally produced food and the hosting of the farmers market. Green lease clauses could encourage the food store to reward customers for buying local produce, for example through a points system, and to encourage the reduction of packaging.

What isn’t currently being considered and why:

- Self sufficiency in food. The Application Site is not large enough to provide the resident population with all of their food. However it can support some small scale food production.
- The food store being limited to selling only local fresh food. The food store will be a commercial operation which has existing supply chains and product lines from local and wider sources. The food store will however be encouraged to reward customers for buying locally produced sustainable food.

National Policy
No reference
Local Policy
No reference
Cambridge City Sustainable Design and Construction SPD
No reference
Code for Sustainable Homes
No reference
BREEAM
No reference
References
<ul style="list-style-type: none">• Design, Access and Landscape Statement. AECOM



Allotments for residents to produce local food.



Space at the local centre for regular farmers markets.

Principle 4: Waste

Make use of opportunities to design out waste and provide new waste infrastructure, to avoid off-site disposal during remediation and construction, through an integrated approach to resource management. Design for recyclability of components arising from the refurbishment, deconstruction and eventual demolition of facilities.

Construction phase: Truly sustainable developments should address the potentially large effects of the construction phase which accounts for around one third of UK waste generation. A site waste management plan (SWMP) developed for the Proposed Development will set out a strategy for reducing waste production. This will propose that existing materials are kept on site and reused where feasible, and methods of construction such as off-site manufacture are used to reduce construction waste.

Locally-sourced, reclaimed and recycled content materials will be used where practicable, including materials from nearby demolition projects if available. Modern methods of construction such as off-site manufacture will also be investigated, whereby waste can be reduced and recycled at the factory. All of these will help to reduce construction waste generation by making use of valuable waste materials from other sites and reduce additional waste generation from the Application Site.

By developing the site over a long period and incorporating large amounts of landscaped areas, the design will mean there should be no need for the transfer of material to or from the site as a result of groundworks, with a balance of cut and fill. This will also have a benefit by reducing vehicular movements and the associated nuisance to neighbouring residents.

Occupancy phase: In occupancy, the design of the Proposed Development will assist residents, visitors and workers to recycle, by collecting separate waste streams from buildings, supplemented by one or more community recycling centres. Businesses on the Application Site will be required to meet stringent levels of waste control and recycling. It is intended that biodegradable waste, from kitchen scraps to garden and landscape waste, will be retained on site for composting using an in-vessel composting system. This compost could be made available free of charge to residents to use on gardens and allotments, and for maintaining the site landscape.

The waste strategy will be designed to make life simple for residents whilst reducing negative effects from bins on the urban landscape. Communal underground bins across the Application Site can encourage recycling without blighting the streetscape.

Significantly reducing overall levels of waste requires a change in occupant's behaviour. The provision of information to all residents to encourage

behaviour change, and clauses in green leases, will help to encourage waste minimisation.

Examples of measures considered:

- Construction phase
- Materials selection heavily weighted towards assessment based on availability of re-usable materials, recycled content, recyclability, lifetime, and embodied CO₂, and efficient manufacture.
 - Materials selection appropriate for the location, building on the high quality image presented throughout Cambridge.
 - Avoiding transfer of materials to or from the Application Site as a result of groundworks.
 - Careful monitoring and reduction of waste generation from the construction process to reduce landfill, and encourage recycling.
- Occupancy phase:
- Communal waste collection systems on most, or all, of the site to reduce the impact of separate wheelie bins.
 - Composting of landscape maintenance waste, allotment waste, and food waste from the food store, school and other on-site catering. Compost to be made available for on-site use.
 - Individual compost bins for private gardens and communal gardens.
 - Separate bins inside buildings for different waste streams to simplify segregation.
 - Recycling centres in public areas.
 - Requirements for commercial organisations to follow the site waste strategy through green leases.

What isn't currently being considered and why:

- Anaerobic digestion. The amount of waste generated on site would result in relatively small amounts of energy generation from an anaerobic digestion scheme.
- On-site energy from waste using advanced thermal processes. These technologies work better at a much larger scale and require a significant amount of pre-processing. The Proposed Development would only produce a fraction of its energy from on-site waste and therefore additional waste would need to be imported.

National Policy
<ul style="list-style-type: none">PPS 1: Delivering Sustainable DevelopmentPlanning for Sustainable Waste Management
Local Policy
<ul style="list-style-type: none">AAP NW28: Construction Process. Sections a, b, c and d.
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">SPD Section 2.5: Recycling and Waste FacilitiesSPD Section 3.3: Materials and Construction Waste
Code for Sustainable Homes
<ul style="list-style-type: none">Materials creditsWaste credits
BREEAM
<ul style="list-style-type: none">Materials creditsWaste credits
References
<ul style="list-style-type: none">Sustainable Resource and Waste Management Strategy. AECOMOutline Site Waste Management Plan. AECOM.Construction Environmental Management Plan. Scott Wilson.



An underground waste collection system is being considered which provides segregated waste collection without the need for unsightly bins for each dwelling. (Image – Sotkon)



Segregated collection will allow the separation of waste streams for all dwellings and non-domestic buildings, helping to promote recycling. On-site composting will be available for green waste.

Principle 5: Materials and construction

Identify, source, and use environmentally and socially responsible materials. Use, where available, certification schemes to guarantee the provenance of environmentally sensitive materials such as timber. Design for and encourage the use of recycled materials in construction and the recyclability of all materials used.

Materials selection and construction processes have a significant effect on waste generation as discussed in the waste section. However materials and construction processes also have a wider environmental effect on the natural environment, neighbouring communities, and people affected by the supply chain of materials.

By encouraging the use of local materials and supply chains, the Proposed Development has the potential to provide a significant economic benefit to the local economy and reduce transportation of materials.

The assessment criteria for materials will mean that re-used and recycled materials are prioritised with the potential for recycling at the end of life also being considered. Materials and buildings will also be designed for a long life with little need for interim refurbishment or re-build. The embodied energy and CO₂, of materials may also be assessed, and used as an additional factor in the selection of materials.

Responsible sourcing of major materials will also be considered and suppliers will be encouraged to have environmental management schemes in place and source all materials legally, meeting international standards, with chain- of-custody certificates. This helps to reduce the likelihood that the supply of materials has an adverse impact on other cultures, ecosystems, and environments.

The Construction Environmental Management Plan will help reduce the impact on local residents by reducing noise and dust production. The requirements will cover all contractors on site, and on-going monitoring will be adopted. Local residents will be consulted during the construction period to help reduce negative impacts and, if appropriate, to discuss methods by which it can be reduced further.

CO₂ emissions associated with transport of staff and deliveries, and on-site energy use during construction phase will be monitored, with efforts made to reduce these through careful planning of construction activities and transportation.

Examples of measures considered:

- Materials selection weighted towards off-site construction, re-usable materials, recycled content, recyclability, lifetime, and embodied CO₂.
- Materials selection aiming for high environmental ratings.
- Major materials responsibly and legally sourced from manufacturers with environmental management systems and materials chain of custody certificates where appropriate.
- Local sourcing of materials.
- Avoiding where possible the transfer of materials to or from the Application Site as a result of groundworks, reducing impact on transport and neighbouring communities.
- Frequent consultation with local residents (both neighbouring and on-site) to assess construction impacts and improve practices if required.
- Early electrification of site to reduce demand for generators, and reduce noise and CO₂ emissions.

What isn’t currently being considered and why:

- Materials selection will be based on a number of criteria, therefore it will not be possible for all materials to meet all of the aspirations including local sourcing, embodied CO₂, recyclability, etc.

National Policy
No reference
Local Policy
<ul style="list-style-type: none">AAP NW28: Construction Process. Sections a, b, c, and d.
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">SPD section 3.3: Materials and Construction Waste
Code for Sustainable Homes
<ul style="list-style-type: none">Materials creditsManagement credits
BREEAM
<ul style="list-style-type: none">Materials creditsManagement credits
References
<ul style="list-style-type: none">Design, Access and Landscape Statement. AECOMConstruction Environmental Management Plan. Scott Wilson.



Materials selection will consider a range of criteria, including recycled content and recyclability, sourcing, and overall environmental impact.



Materials selection and building design will be responsive to the need for a high quality environment which is sensitive to its surroundings.

Principle 6: Biodiversity and ecology

Protect the biodiversity and ecology of the existing area and plan for a natural environment that balances the needs of access with assured survival of bio-diverse areas and habitats.

The Application Site is predominantly green field with some ecologically valuable features including the Washpit Brook, seven species rich hedgerows and some mature trees. However a large part of the area has relatively low ecological value being intensive farmland.

Once developed, approximately 50 ha of the Application Site will remain as open land, providing significant opportunities for increasing overall ecological value. All features of major ecological value have been incorporated into the design of the Proposed Development and will be protected during the construction process to add maturity and biodiversity to the final scheme. Additional planting of a range of native species will increase the overall site ecological value, with areas being provided for wildlife.

New habitats are being provided, particularly within the extensive area of public open land along the western edge of the Application Site. This area will include new wetland features of value for water voles, a new badger sett and ideal foraging habitat for badgers, and ponds and valuable foraging habitat for great crested newts.

Bat and bird boxes will be installed throughout the Application Site, both within public open land and the residential areas, and artificial otter holts will be constructed on the Washpit Brook.

The long term care and maintenance of ecology and biodiversity on the Application Site will help to create a healthy place for building occupants and wildlife, with the added benefits of natural cooling from the plants and trees, and shade in the summer. This will mean that residents, workers and visitors are provided with areas for relaxation and exercise, and the effects of higher summer temperatures with future climate change are mitigated to some extent.

Long term management of the landscape will be an important feature of the Application Site with the Applicant committing to 5 yearly ecology management plans. During the construction phase, undeveloped areas will be managed and used to provide mature planting for the Application Site, with on-site plant and tree nurseries.

Examples of measures considered:

- Existing features of major ecological value will be retained including the Washpit Brook, and trees and hedgerows where possible.
- Creation of new habitats for water voles and otters along the Washpit Brook corridor, including artificial otter holts.
- Introduction of bird and bat boxes throughout the site.
- Retention of badger setts where practicable and construction of an artificial sett; provision of particularly valuable foraging habitat for badgers within a copse which is retained within the public open space.
- Creation of new breeding ponds for great crested newts and provision of valuable foraging habitat for the population associated with off-site ponds.
- Landscape planting which increases the overall ecological value through extensive planting of a wide range native species.
- Creation of wildlife areas in the western edge [to be used for leisure and education].
- Off-site habitat enhancement for farmland birds and brown hares.
- Five year ecology plan for the Application Site.
- Retention and protection of existing significant ecology on-site during the construction phases with a biodiversity champion nominated by each contractor.
- Appropriate method statements to protect wildlife during construction and works carried out under licence to Natural England, where required.

National Policy
<ul style="list-style-type: none">PPS 9: Biodiversity and Geological ConservationDraft PPS: Planning Natural and Healthy Environments
Local Policy
<ul style="list-style-type: none">AAP NW4: Site and Setting.
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">SPD section 2.6: Biodiversity
Code for Sustainable Homes
<ul style="list-style-type: none">Ecology credits
BREEAM
<ul style="list-style-type: none">Land use and ecology credits
References
<ul style="list-style-type: none">Design, Access and Landscape Statement. AECOMBiodiversity Strategy. MD Ecology.Ecological Assessment Environmental Statement.



The landscape strategy will provide new habitats for wildlife, and places for residents to enjoy and relax in.



The creation of new habitats and maintenance of existing features will provide facilities for enjoyment by residents, and education for children.

Principle 7: Pollution

Encourage positive outcomes and reduce adverse effects on land, water, and air quality. Restore land to beneficial use and avoid risk of flooding on and off site arising from the development. Use opportunities afforded by the Proposed Development to enhance land, water and air quality.

Noise: The noise climate across the Application Site is dominated by traffic on the M11 to the west, and to a lesser extent by traffic on Huntingdon Road to the east and Madingley Road to the south. The objective is, through building design and internal layout, to provide suitable internal noise levels within buildings whilst enabling natural ventilation, and to open spaces to meet local policy requirements and provide attractive leisure spaces.

Air: Local air quality within the Application Site is generally of a good standard although road traffic emissions elevate background concentrations to undesirable levels close to the busier roads surrounding the site and within Cambridge City Centre. The suitability of the Application Site for residential use and the potential effect of the Proposed Development on local air quality in the surrounding area have been assessed in accordance with the approach set out in Planning Policy Guidance PPS23: Planning and Pollution. A combination of sustainable transport planning and thoughtful site layout have been considered supported by the use of computational models to gauge the dispersion of emissions of air pollutants and avoid and manage any adverse effects.

Water: The Application Site is located at the headwaters of the Washpit Brook, which receives runoff from the Greenfield catchment and runs along the toe of the M11 embankment on the western boundary. The site is generally situated within Flood Zone 1, where the annual probability of flooding from tidal or fluvial sources is assessed as being less than 1 in 1000, but that a small portion of the site situated adjacent to the Brook is within Flood Zone 2 and 3. Land use has been sequentially located to ensure that more vulnerable development, such as residential, academic and commercial buildings are located entirely within Flood Zone 1. A cascading system of Sustainable Urban Drainage Systems (SUDS) will be used to attenuate and improve the quality of runoff from paved areas and replicate as closely as possible the natural drainage of the Application Site before development.

Ground: The Application Site is generally undeveloped agricultural farmland and there are several buildings present, including an Animal Research Station, Agronomy Centre and World Conservation Monitoring Centre which are unlikely to have generated contaminants. Ground investigation works support this analysis

Light: The streets within the Application Site will be illuminated to create a secure environment and to minimise light pollution, energy consumption and any adverse effects upon wildlife and landscape. Lighting levels will vary

throughout the Proposed Development according to the volume of vehicular and pedestrian traffic and proposed adjacent land use. Streets adjacent to wildlife corridors will have lower lighting levels and reduced luminaire mounting heights to reduce light spill into the surrounding area.

Examples of measures considered:

- Site layout designed to provide acceptable noise climates to open land and buildings.
- Design of internal layouts of buildings to take advantage of “quiet” facades.
- Site layout designed to reduce exposure to air pollutants generated by road traffic
- Source control features such as porous paving, swales, filter strips and soakaways to attenuate and improve the quality of runoff from paved areas where intercepted.
- Site control features such as retention ponds and linear wetlands to provide a secondary level of treatment and attenuation before the runoff is discharged to the existing watercourse at pre-developed rates.
- Rainwater harvesting and soakaways to intercept runoff from roof areas and to enable water recycling within buildings.
- White lighting sources to allow a lower lighting class to be used on residential streets, providing energy savings and reduced light pollution along with better ‘quality’ light. Automated switching, time controls, and photoelectric controls to reduce lighting times reducing energy consumption and light pollution.

National Policy

- PPS 10: Planning for Sustainable Waste Management
- PPS 23: Planning and Pollution Control
- PPG 24: Planning and Noise
- PPS 25: Development and Flood Risk
- PPG1: General Guide to the Prevention of Pollution (Sustainable Development)
- PPG2: Above Ground Oil Storage (2004)
- PPG5: Works in, near or liable to affect watercourses
- PPG6: Working at construction and demolition sites
- PPG13: Vehicle washing and cleaning
- Groundwater Protection: Policy and Practice (GP3)
- Future Water - The Government's Water Strategy for England
- Environment Act 1995;
- Environment Protection Act 1990 Part II (as amended);
- Control of Pollution (amendment) Act 1989;
- Hazardous Waste (England and Wales) Regulations 2005; and
- Environmental Protection (Duty of Care) Regulations 1991 (as amended).

Local Policy

- Air Quality Action Plan for the Cambridgeshire Growth Areas
- South Cambridgeshire D.C. Development Control Policy NE/16
- AAP NW24: Climate Change and Sustainable Design and Construction
- AAP NW25: Surface Water Drainage
- AAP NW27: Management and Maintenance of Surface Water Drainage Systems
- Cambridge Area Water Cycle Strategy
- Local Plan Policy 4/13.
- Local Plan Policy 4/15 - Lighting

Cambridge City Sustainable Design and Construction SPD

- SPD section 2.7: Pollution

South Cambridgeshire District Council. District Design Guide SPD

- SPD Appendix 6: Noise – Detailed Design Guidance

Code for Sustainable Homes

- Pollution credits

BREEAM

- Pollution credits

References

- North West Cambridge Air quality assessment (ES Chapter 14). Scott Wilson
- North West Cambridge Noise assessment (ES Chapter 13). Scott Wilson.
- North West Cambridge Hydrology Drainage and Flood Risk Assessment (ES Chapter 15)
- North West Cambridge Utilities Assessment (ES Chapter 17)



Sustainable urban drainage systems (SUDs) will be used to minimise the risk of flooding by reducing surface run-off in storm conditions. Interceptors will be used as part of the SUDs system to reduce pollution from hard landscaped areas such as car parks.



External lighting design will aim to minimise light pollution, directing light to where it is needed, and helping to maintain a dark night sky.

Principle 8: Global, local and internal environments

Design and build in a sensitive manner for internal and local environments, adaptable to future climates. Actively engage in design that accommodates the potential effects of climate change through adaptation strategies, and design so as to mitigate as far as reasonable the potential adverse effects of the Proposed Development on climate change.

It is widely acknowledged that some degree of climate change is inevitable as a result of historic emissions of carbon dioxide. Higher summer temperatures, lower yearly rainfall and more intense storms are expected. Designing buildings and sites to be able to cope with future, as well as current climatic conditions, is therefore necessary.

The Proposed Development will be designed in a way which reduces the risk of overheating without incurring additional air conditioning where possible. Buildings will also need to cope with more adverse weather conditions including higher rainfall and winds, and the Proposed Development will reduce additional surface water run-off with future rainfall levels.

Measures to reduce the need for future domestic air-conditioning, such as orientating dwellings south to reduce morning and evening solar gains, the use of overhangs and pergolas, optimisation of window areas and glazing performance and thermal mass will be incorporated where practicable. Measures will also be investigated to reduce the urban heat island effect through the use of reflective surface finishes, trees and vegetation. Water features in the Proposed Development, such as the balancing ponds located within the linear parkland along the M11, and swales located within the built development, will provide natural cooling and help manage water run-off during storms.

Measures to improve internal environments will include natural ventilation with designs aimed at limiting pollution and noise from outside. Daylighting will also be important in providing natural working and living environments and appropriately located windows will allow residents to have good views out from their homes and workplaces. Buildings will generally be shallow plan to achieve these aims.

Mitigation of climate change features strongly across the Application Site and the other sections in this report demonstrate the steps proposed to minimise energy and CO₂ emissions associated with direct and indirect consumption of energy.

Examples of measures considered:

- Buildings spaced, and windows designed, to optimise natural daylighting whilst reducing overheating risks. Provision of attractive healthy environments and minimising energy consumption from artificial lighting.
- Southerly orientation of buildings, to capture solar gains in winter for free heating, but to minimise overheating in summer. External shading and building design to provide summer shading.
- Commercial and research buildings with shallow plans to allow natural ventilation throughout most of the year. Green leases so that buildings are operated with minimum reliance on artificial cooling.
- Dwellings designed to meet predicted comfort criteria for 2050 temperatures using natural ventilation to reduce the use of domestic air conditioning.
- Use of thermal mass as a method of reducing overheating.
- Extensive green infrastructure including urban landscaping and planting to provide cooling through evapo-transpiration and shading to exterior areas and buildings.
- An extensive network of Sustainable Urban Drainage Systems (SUDS) to attenuate run off and limit to pre-developed levels.
- Materials and coatings with a high reflectivity for hard landscaping and building roofs to reduce heat absorption in summer.
- Materials used in the fit-out of buildings having low volatile organic compound (VOC) levels to provide a healthy environment for residents.

What isn’t currently being considered and why:

- Non-domestic buildings being entirely naturally ventilated. For modern buildings with high internal gains (for example from ICT), it is not always possible to rely on natural ventilation alone. Therefore the mixed mode approach with natural ventilation and additional cooling is planned for the Proposed Development.
- Green roofs can provide additional thermal mass, reduce rainwater run-off, and provide bio-diverse habitats. However the Proposed Development includes significant open areas with new habitats, and rain water harvesting is proposed for all buildings, with solar thermal and PV systems on the roofs. Therefore the potential for green roofs is limited and whilst they may feature on some buildings where practicable, they are not a core component of the proposals.

National Policy
<ul style="list-style-type: none">• PPS 1: Delivering Sustainable Development• PPS 1 Supplement: Planning and Climate Change• Draft PPS: Planning for a Low Carbon Future in a Changing Climate• Draft PPS: Planning Natural and Healthy Environments• PPS 25: Development and Flood Risk
Local Policy
<ul style="list-style-type: none">• AAP NW24: Climate Change and Sustainable Design and Construction. Section 1• AAP NW25: Surface Water Drainage
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">• SPD section 3.1: Adaptation to Climate Change
Code for Sustainable Homes
<ul style="list-style-type: none">• Health and Wellbeing credits
BREEAM
<ul style="list-style-type: none">• Health and Wellbeing credits
References
<ul style="list-style-type: none">• Carbon Reduction Strategy Parts A and B. AECOM• Sustainability Statement Appendix 1: Climate Change Adaptation. AECOM.



Dwellings will be designed to reduce scope for overheating in summer, making use of natural ventilation and shading techniques to provide a healthy internal environment. Natural daylight will also be used to minimise electricity for lighting consumption and to improve internal conditions.



Non-domestic buildings will use solar shading to minimise unwanted solar gains and help to reduce the need for air-conditioning, whilst providing high quality natural lighting.

Principle 9: Culture, heritage, and built form

Develop designs that embrace the culture and heritage of the setting and reflect local values and expectation consistent with the vision for the Proposed Development.

The City of Cambridge is unique in many ways, in particular having been shaped by the University over the last 800 years. This clear sense of the city’s history is central to Cambridge’s character.

The desire to create an exemplar development extends to creating a high quality long life development which takes design inspiration from across Cambridge whilst presenting the best in modern architecture.

The Proposed Development contains a mix of uses providing education, research, living, leisure, and commercial facilities on one site. The layout is centred around a number of nodes, bringing together complementary uses and providing a mix of uses to create viable neighbourhoods. The development blocks, layout, parameters and access provide ease of movement across the site for vehicles, and for pedestrians and cyclists using dedicated non-vehicular routes, and allow the penetration of the natural landscaping with ‘green fingers’ from the western edge. By locating the local centre near the middle of the Application Site adjacent to the large open area known as Storey’s Field, facilities and leisure space are open to all residents on the Application Site with a minimal walking or cycling distance using the Ridgeway cycle and pedestrian route.

The designs will reference existing features from Cambridge including the use of courtyards to provide quiet, secure, and shaded external space for residents. The combination of well maintained open and communal land and high quality design will reflect the existing Cambridge heritage making this a long term addition to both the University and the City.

This heritage extends to cultural facilities with Cambridge characterised by the large number of musical, theatrical, and artistic venues and events. Storey’s Field will become another Cambridge venue for outdoor events, providing a North West Cambridge equivalent of Parkers Piece (in scale). The community facilities will be available to residents for arts events and adaptable University facilities could be used for concerts and theatrical productions.

Examples of measures considered:

- Application parameters enable the detailed design to echo existing Cambridge structures including the use of courtyards to create private spaces.
- Incorporation of high quality materials and architecture to take design cues from the existing city.
- Development of cycling infrastructure to link the Proposed Development to the city and surrounding areas, and provision of significant on-site support for cyclists.
- Large formal open spaces for leisure and the hosting of events.
- Informal open space for gardens and leisure to provide facilities for socialising and relaxing.
- Community facilities and academic facilities which could be used for a range of cultural activities including music, theatre and art.
- Information presented around the Application Site to promote recreation including the SSSI, and natural habitats.
- Public art strategy to set out a visionary role for an integrated art and culture programme across the life of the Proposed Development.

What isn’t currently being considered and why:

- Separate cultural facilities such as a concert hall or theatre. Cambridge currently has a large number of cultural venues in and around the city, including University venues. Therefore a separate venue is not considered viable for the Proposed Development and a facility located on the Application Site would not have the co-location advantages of many of the other venues in the city. However adaptable space, including lecture theatres and community facilities will be available for hosting cultural events as part of the Proposed Development.

National Policy
<ul style="list-style-type: none">• PPS 5 : Planning for the Historic Environment• Draft PPS: Planning Natural and Healthy Environments
Local Policy
<ul style="list-style-type: none">• AAP NW4: Site and Setting• AAP NW7: Balanced and Sustainable Communities• AAP NW20: Provision of Community Services and Facilities, Arts, and Culture• AAP NW21: A Local Centre
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">• SPD section 2.1: Urban Design.• SPD section 3.4: Historic Environment
Code for Sustainable Homes
<ul style="list-style-type: none">• Ecology credits
BREEAM
<ul style="list-style-type: none">• Health and Wellbeing credits• Land Use and Ecology credits
References
<ul style="list-style-type: none">• Design, Access and Landscape Statement. AECOM.• Environmental Statement Chapter 10: Cultural Heritage• North West Cambridge Public Art Strategy. Contemporary Arts Society.



The built form of the Proposed Development will reference existing Cambridge buildings, providing quiet, secure, and shaded external spaces for residents.



High quality landscaping and external spaces to provide areas to relax for both residents and workers on the Application Site will encourage the interaction between students, academics, commercial researchers and residents and promote a rich community.

Principle 10: Transport and mobility

Create an accessible, pedestrian friendly site, with good connectivity to surrounding areas. Connect the site with existing public transport facilities and existing, cycle-ways and footways. Engender mode shift towards public transport, cycling and walking through measures to address security, journey time, comfort and perception.

Cambridge has unusual travel characteristics, with a large proportion of social trips and commuting using walking, cycling and public transport. Car use is correspondingly low with only 27% of Cambridge residents travelling to work within Cambridge by car and a total of only 44% of commuting journeys using a car during the last census. The Application Site is well-located for sustainable transport, and has specially selected land-uses that will also assist in reducing the demand to travel. The provision of 1,500 key worker housing units provides the opportunity to significantly reduce car-based trips by co-locating employment and living accommodation enabling walking and cycling.

The Site-Wide Travel Plan will set targets for commuting to work for residents and employees of the Proposed Development below the Cambridge average of 44% to reduce car use. Safe, attractive and appropriate routes for pedestrians and cyclists through a network of car-free segregated routes and traffic calmed areas will be provided, combined with cycle storage facilities in both homes and employment areas. On-site pool-cycles are also are being considered to provide residents with easy access to conveniently located bicycles. The food store will also be encouraged to assist shoppers to make a car-free journey through the provision of cycle facilities, convenient public transport stops, and home delivery services.

Cycle training could be offered to new residents and employees, and “Walking Bus” schemes could both increase the safety of children walking to school, and help enable social inter-activity. Larger employment buildings will be equipped with conveniently located cycle storage, with changing, showering, and storage facilities inside the buildings for pedestrians and cyclists. Homes will be equipped with secure cycle storage areas to remove the need to leave bikes outside on the street or in gardens.

Car parking on the Application Site will be set at or below minimum AAP standards to help manage the demand in favour of more sustainable transport modes, and to reduce visual impact. Whilst car use can be reduced, some journeys will doubtlessly require cars. The existing successful Car Club scheme in Cambridge will be expanded to the Proposed Development to accommodate residents and employees who want to live car-free lives apart from those essential trips. The Cambridgeshire car-share scheme will be promoted development-wide for both employees and residents on the Proposed Development’s community intranet.

Homes with garages will be equipped with electricity supplies suitable for charging electric vehicles. Provision of additional electric vehicle charging points at car parking areas within the local centre, and at the other car parks is being examined across the Application Site.

Examples of measures considered:

- A Site-Wide Travel Plan has been developed to promote sustainable transport, aimed at increasing walking, cycling, and public transport, and reducing car use.
- Equipping homes with secure cycle storage in accordance with the AAP and Code for Sustainable Homes standards. Providing non-domestic buildings with high quality secure covered cycle spaces and showering and changing facilities.
- Providing on-site bicycle pools at hubs across the Application Site is being considered along with cycle maintenance services in the Local Centre.
- Providing electric car charging points in car parks and on-street, and electricity supply for future car charging in domestic garages.
- Providing a car club through a national operator enabling car use for car-based essential journeys without needing to own a car. . A travel plan coordinator will be responsible for maintaining this service.
- Good public transport links including connections to the Park & Ride Site on Maddingley Road, which provides access to direct and high-frequency services to the City Centre. Real-time information displays for public transport in non-domestic buildings, bus stops, and on the community website.
- Well-located on-site hopper bus services, to transport people through the Application Site to local and City destinations.
- An appropriate level of car parking to reduce car demand without impacting upon the quality of the Proposed Development.
- Segregated cycle and pedestrian provision on major routes, including the Ridgeway. Shared surfaces for minor routes and parts of the local centre with traffic calming to provide a safe environment for pedestrians and cyclists giving them equal priority of vehicles.
- On-site nursery & school. Encouragement to use “walking bus” as a safe means of taking children to school without using cars.
- Provision of free cycles to car free homes and discounts on cycles for other residents. Promotion of University Cycle purchase scheme to University employees.
- Provision of free / deposit based cycle trailers from retail stores for local residents.

What isn’t currently being considered and why:

- Car free site. There will always be a demand to some extent for private transport – the challenge is to minimise the use of cars by providing attractive, more convenient alternatives. Totally banning cars would make the Proposed Development very unattractive to most residents and businesses that will require occasional use of cars.
- Perimeter parking. This may be considered in certain areas of the Application Site, but is not considered viable for the entire Application Site.

National Policy
<ul style="list-style-type: none">• PPG 13: Transport• PPS 1 Supplement: Planning and Climate Change
Local Policy
<ul style="list-style-type: none">• AAP NW11: Sustainable Travel• AAP NW14: Maddingley Road to Huntingdon Road• AAP NW16: Public Transport Provision• AAP NW17: Cycling Provision• AAP NW18: Walking Provision• AAP NW19: Parking Standards• AAP NW21: Local centre
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">• SPD section 2.2: Transport, Movement, and Mobility.
Code for Sustainable Homes
<ul style="list-style-type: none">• Energy credits
BREEAM
<ul style="list-style-type: none">• Transport credits
References
<ul style="list-style-type: none">• Transport Assessment. Peter Brett Associates.• Site-Wide Travel Plan. Peter Brett Associates.



Cycling will be promoted on the Application Site through the provision of covered secure cycle storage, cycle facilities in buildings, and an extensive network of safe cycle routes.



Expansion of existing bus routes and the creation of new bus routes through the Application Site will provide excellent services into and around Cambridge. Real time provision of timetable information to residents will make travelling by bus as simple and reliable as possible.

Principle 11: Housing, amenity and wellbeing

Create new attractive and appealing, safe, mixed use public space, housing and facilities appropriate to the demographics and character of Cambridge. Seek new ways of delivering more sustainable communities.

The development of a community is central to the creation of a sustainable development. The community is primarily made up of people who live on the site, people who work on the site, and the businesses and organisations located on the site. The community also includes neighbouring areas, both homes and businesses. Providing an attractive development in which people can meet, socialise and interact is therefore central to the application proposals. Through living together, walking and cycling, and making use of local community facilities, opportunities for meeting other people are provided. By combining academic and residential facilities on the same site, the live-work mix will provide a creative exchange for new ideas.

Retail units, including a food store and small shops in the local centre, reduce the need for people to drive to other parts of the city for weekly shopping.

An on-site community facility, the hotel and on-site sport facilities will allow residents to participate in cultural, leisure, and multi-faith activities in their locality without having to travel to other parts of the city, stimulating mixing of residents from the private and key worker housing across a range of cultures.

The creation of a successful community cannot be forced but will require supportive infrastructure that can support the will and desire of residents. From the outset, a community website may be available to residents, to help develop a “Sharing Community”, where residents can share ideas, skills, and equipment and organise events. This will help foster links between home owners, tenants, and businesses and organisations at the Proposed Development.

The Proposed Development will provide a healthy environment for residents, both through the provision of extensive green leisure space and green gym facilities, significantly increasing the amount of open area available to the public over the current site, and also through providing healthy buildings with good internal environments. Buildings will be naturally ventilated where practicable and provide good levels of natural daylight. Residential buildings will be favourably orientated and dual aspect where practicable. All homes will also have access to private external space, either private gardens, or communal gardens allocated to designated dwellings.

Examples of measures considered:

- Mixed use site providing leisure, residential and work areas, leading to a creative exchange atmosphere.
- A community centre for use by residents.
- Community website available from the outset providing forums, data exchange, local adverts and information, and a portal for setting up new groups and exchanging ideas.
- A community where ideas, skills, facilities and equipment can be shared.
- Dual aspect dwellings where practicable to enable views, good daylighting and cross ventilation.
- Narrow plan buildings to allow natural ventilation through most of the year.
- High levels of daylighting to minimise lighting use and provide a natural well lit internal environment.
- External space in the form of private gardens or well maintained restricted-access communal gardens.
- Green leisure facilities including signed walkways and trails, and green gym facilities providing outdoor exercise opportunities.
- Sports facilities in the form of pitches and courts and indoor sports facilities.
- Play areas for different age groups and abilities.

National Policy
<ul style="list-style-type: none">• PPS 3: Housing
Local Policy
<ul style="list-style-type: none">• AAP NW7: Balanced and Sustainable Communities.• Cambridgeshire Green Infrastructure Strategy (Consultation draft)
Cambridge City Sustainable Design and Construction SPD
<ul style="list-style-type: none">• No reference
Code for Sustainable Homes
<ul style="list-style-type: none">• Health and Wellbeing credits
BREEAM
<ul style="list-style-type: none">• Health and Wellbeing credits
References
<ul style="list-style-type: none">• Carbon Reduction Strategy Part A and B. AECOM• Design, Access, and Landscape Statement. AECOM• Faith Needs Assessment



Suitable outdoor play facilities will be provided in a number of locations across the Application Site. Adult facilities such as fitness trails and green gyms will also be provided.



Large parts of the Application Site will provide attractive external space for use by occupants (residents and workers), with a mix of natural and landscaped areas, and external sports and leisure facilities.

Principle 12: Education and employment

Provide new employment and business opportunities locally, regionally and nationally. Integrate the development of skills training and education into the design and development of the facilities engaging all players in becoming part of a process to enhance opportunities for people.

Education and learning is at the heart of the University of Cambridge, and the University is the nucleus of the city. The Proposed Development will aim to build upon this foundation, providing education and learning opportunities through both the development and occupancy phases.

New jobs will be created, and skills learnt throughout the phased construction. Apprenticeships may be created to develop more local skills and jobs. On-site induction and training will be provided to educate construction teams on the sustainability features applying at the Application Site, providing knowledge which it is hoped will be passed on in future schemes. Links will be made with the local Further Education Colleges so that the site can provide a source of data which could be used as part of relevant training courses.

Cambridge is an economic hub for the Eastern Region, and a nationally important area for scientific and hi-tech industries; The Proposed Development will provide a strategic employment location for the expansion of this existing base. It will provide additional employment opportunities for both the University and private sector companies in the service and professional areas.

Education will be ingrained within the Proposed Development, with a number of new academic teaching and research buildings, students and staff living on site, and the creation of a new school. The Proposed Development itself will also be an education, providing an introduction to the sustainable living and working approach. In some ways this will be passive with residents living the experiment. Along with this, the features and facilities on the Application Site will be explicit, with information displays, and open days explaining the operation of, for example, the district heating and CHP system. Ecology is another area where the site will play an educational role with wildlife habitats and nature areas available for the public, and linked to the school activities.

Post occupancy monitoring of dwellings and non-domestic buildings may be conducted through the community intranet, with data collected on items such as energy consumption using the smart metering system, and occupancy surveys used to assess the effectiveness of measures in relation to occupant activity. The community website would enable interested residents to compare their information with others to encourage competitive behaviour change.

The measured information can be used to inform future phases of the Proposed Development and helps to inform other developments through

publication of data and analysis. Consistent data from a site this large will form a valuable input to academic research within the University helping to drive future sustainable development principles and practices.

Residents will be encouraged to behave in an energy efficient manner through the provision of, or recommended purchase of, equipment meeting certain efficiency standards, and through being educated about the benefits of reducing energy demand, with associated cost savings.

Examples of measures considered:

- Creation of space for University academic and commercial research, and service sector jobs.
- Development of a new school linking with the site sustainability features to provide learning facilities for pupils.
- Sustainability infrastructure on display with information available to the public on the design and operation of the systems. Opportunities to enhance this via occasional open days for the public and interested organisations.
- The University will take an ongoing role in the monitoring and assessment of the Application Site from a sustainability perspective including resident surveys. This includes publication of update reports providing information on the performance of the Proposed Development and effectiveness of the measures from which future developments can learn.
- Energy and water meters could be linked to the community intranet to allow centralised recording and monitoring of data. Information will be available to individual buildings and homes, and if people choose, can be compared on the community website to encourage competitive behaviour and exchange of energy information.
- Education and encouragement of behaviour change through green leases and provision of efficient equipment, combined with energy efficiency advice.
- All new residents including those in private market housing to be provided with a “sustainability information pack” with information on the Application Site’s sustainable features and design ethos, operation of buildings and services, and other sources of information.
- Local apprenticeships could be provided by contractors during the construction phase.
- Induction for all workers and contractors on site explaining the sustainability principles behind the design and how the construction process contributes to this.
- On-site training on the installation and maintenance of low and zero carbon technologies to increase the local skills base. This could include

- links to local colleges such as the Cambridge Regional College, who provide training courses.
- Site sustainability coordinator to oversee sustainability on the Application Site during the construction phase and coordinate collection and monitoring of construction data.

What isn’t currently being considered and why:

- Secondary school. Additional provision of secondary school places has been allocated to other new sites in Cambridge and is not required as part of the Proposed Development.

National Policy
No reference
Local Policy
<ul style="list-style-type: none">• AAP NW8: Employment Uses• AAP NW9: Employment Uses in the Local Centre
Cambridge City Sustainable Design and Construction SPD
No reference
Code for Sustainable Homes
No reference
BREEAM
No reference
References
No reference



A school centrally located on the site will promote sustainable living and behaviour, and make use of the extensive facilitates on the site, including natural habitats, to educate children.



Education and learning for primary school children, students, academic staff, and domestic residents is central to the concept of the Proposed Development. The co-location of people will help foster an interactive community and create new ideas.

Principle 13: Inclusion

Involve, communicate, and consult effectively with stakeholders and surrounding communities.

Develop throughout the design process and implementation, designs and decisions that recognise diversity in all its aspects; diversity of physical ability, diversity of mental ability, diversity of cultural and religious backgrounds, diversity of literacy, language, age and gender.

An inclusive development is central to the ongoing sustainability of the Application Site, so that that the Proposed Development is correctly designed in the first place, taking into account the needs and desires of potential residents and the local community, and so that that the all residents are treated equally and inclusively.

The masterplanning of the Proposed Development started in 2005 and thereafter, a number of consultation events have been held with local residents, potential residents (both domestic and commercial), and parish, city, and county council representatives. This process has ensured that there is a strong level of public understanding of the proposals to allow comment and feedback to be obtained at each stage of the design. Information has been available to the public through the project website and the Area Action Plan public inspection allowed interested parties to comment on the proposals and to help to guide the policy which will help shape the Proposed Development.

The Proposed Development by its very nature will be diverse with a mix of private home owners, University key workers and commercial tenants. The international nature of University’s teaching and research will mean a wide variety of cultures and diversities will be resident on the Application Site across a range of ages and abilities. This is part of ‘what makes Cambridge Cambridge’.

Dwellings on the Application Site will be tenure blind, being designed and built to the same quality standards. A suitable proportion of homes will be built to ‘Lifetime Homes’ standards allowing them to be used by a range of abilities and ages and future proofing for long term residence. Community facilities will be available to residents and provide space for staging events, and for clubs and other services. The community website will be central to stimulating this interaction, providing a portal for all community groups to have a public face and discussion forum.

Examples of measures considered:

- Consultation so far:
- A comprehensive public consultation process commenced in 2005 allowing the design proposals to be shared and providing a forum for discussion and feedback into later design iterations.
 - Technical consultation with the relevant planning representatives from Cambridge City Council, South Cambridgeshire District Council, and Cambridgeshire County Council to ensure proposals meet the various planning requirements.
 - Public inspection of the Area Action Plan allowing local residents and groups to comment on, and input to, the policy guiding the site.
 - Public website providing the latest information and contact details for questions and feedback.
 - Expert input from the University and other experts to guide the technical design based on past experience of similar projects such as BedZED.
- Future consultation:
- The consultation process will continue throughout the design period and through each phase, so that local communities have their say in the proposals.
- Design inclusivity:
- A range of accommodation sizes and types available to suit various budgets and requirements, from small flats to large detached homes.
 - Key worker homes constructed to the same design and quality standards as private housing to provide tenure-blind accommodation.
 - Key worker homes available in different forms to suit occupancy length, budget and family circumstances.
 - Senior Care accommodation provided close to the local centre.
 - A proportion of dwellings will meet ‘Lifetime Homes’ standards to future-proof them for older residents and long term occupation.
 - Support for residents of all diversities in terms of abilities, ages, culture, religion, language and gender through a community body, bound by constitution, and public community website portal.

National Policy
No reference
Local Policy
<ul style="list-style-type: none">• AAP NW7: Balanced and Sustainable Communities.
Cambridge City Sustainable Design and Construction SPD
No reference
Code for Sustainable Homes
<ul style="list-style-type: none">• Health and Wellbeing credits
BREEAM
<ul style="list-style-type: none">• Management credits
References
<ul style="list-style-type: none">• Design, Access and Landscape Statement. AECOM• Key Worker Housing Statement. AECOM• Statement of Community Involvement. AECOM



The proposals aim to create an inclusive site, where people of all ages and backgrounds can interact and socialise, creating a sharing community.



Community consultation has been an important aspect during the pre-application process, testing proposals with a range of people, and helping to develop new ideas which fulfil the requirements of the wider community.

Delivery of the sustainability principles

The University of Cambridge will retain long term ownership and control over most of the Proposed Development and its environs. This will help to maintain the ongoing sustainability of the Application Site. A number of proposals are made to help deliver and maintain a sustainable development as outlined below.

Design Guidelines

The sustainability strategy laid out in this statement will be interpreted into Design Guidelines. The Design Guidelines will be submitted to the authorities and approved before or as part of reserved matters applications for the Application Site. The guidelines will provide a link between the illustrative materials produced for the planning application and the detailed design of schemes at reserved matters stage. They will set out the design requirements for achieving a high quality of environment and provide design coherence across the Proposed Development whilst maintaining flexibility during the extended implementation period. The status of the guidelines will be advisory as a base case against which to evaluate future scheme designs and development scenarios. The guidelines will set the design principles and form a reference point for a design discourses between the University, future designers and the local planning authorities.

Rating methodologies

All homes are proposed to meet the Code for Sustainable Homes level 5 or above. All non-domestic buildings are required to achieve the relevant BREEAM Excellent rating. Meeting these standards will require assessment by accredited BREEAM and Code assessors who will check information from both the design and construction phases, and carry out post construction reviews. This will provide independent verification of many features.

Tendering for services

When services are tendered for the Proposed Development, for example to developers of individual plots, sustainability principles will be embedded in the tender documentation. All responses will be considered on the grounds of sustainable design proposals alongside other considerations.

In addition to the Design Guidelines, Development Briefs will be prepared as individual phases come forward. Whilst the Design Guidelines will set out the overall design requirements for the entire Application Site, the Development Briefs will set out design and procurement requirements for specific plots and respond to the market conditions at the time. These future Development Briefs will provide a reference tool for the University and direction to other developers on the scheme.

Green leases

Green leases and contracts will be considered across the Application Site for non-domestic and domestic buildings. These would require the building occupier / owner to operate within a certain sustainable framework. An example might be a requirement for a company to have a trained sustainability champion, or for residences, limiting car parking spaces. They would also increase the likelihood that commercial organisations comply with factors outside the University’s direct control such as waste management or procurement.

Options for the food store in particular will be explored – this facility has a considerable influence over the Application Site and neighbouring areas and provides a good opportunity for demonstrating sustainable retail practice.

There is increasing interest in the use of green leases across the UK and support from businesses. However they need to be refined so that the day-to-day operation and economic viability of the businesses and organisations are not adversely affected.

Community body

A community body will be established to take on long term operation and management of the ‘softer’ community measures such as management of the community website, organisation of events, and interaction with neighbouring areas and groups like residents’ associations. The body will have the sustainability principles embedded in its constitution and will support measures aimed at meeting these principles. The body will be made up of a number of representatives including private and key worker residents, the University, and companies operating on the Application Site including potentially the food store and Energy Supply Company (ESCo) if one is appointed to manage and run the Energy Centre.

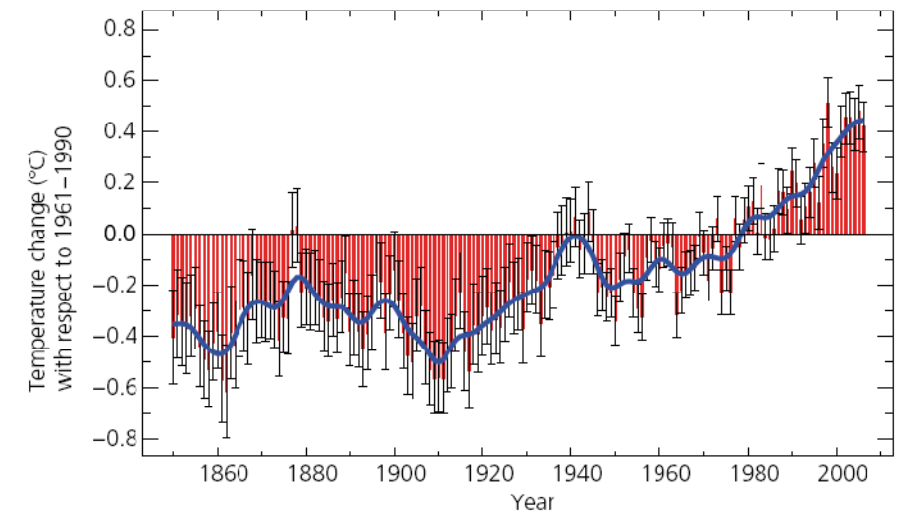
Appendices

Appendix 1: Climate Change
Adaptation

Climate change
A changing climate

There is international scientific agreement that the earth’s climate is changing and will continue to change as a result of increased concentrations of greenhouse gases. The most prevalent of these is CO₂ and the overwhelming evidence base suggests that this is as a result of the burning of fossil fuels by humans.

The climate has always changed with fluctuations in global temperature resulting in historical warm and cold periods. The current rate of change though is significantly faster than any past change in history and this has important consequences on the way that buildings and infrastructure is designed and operated. Future development needs to reduce the effects which are causing climate change to minimise any future changes, and also prepare for the change which is likely to occur in the shorter term.



Change in annual-average global-mean near-surface temperature showing increases in temperature during the 20th century as a result of rising CO₂ emissions. (Source – UKCIP)

Mitigation or adaptation?

Climate change **mitigation** is something we need to do as a society. Mitigation is about changing the way we live and generate energy to reduce the emissions of greenhouse gases which are causing climate change. New development plays a role in this and much of the work on the Proposed Development, particularly in terms of energy and transport, aims to mitigate

against further climate change, by reducing our reliance on fossil fuels and minimising CO₂ emissions.

The concept of climate change **adaptation** is more recent in the UK, although basic climate adaptation is a feature of buildings internationally to allow them to cope with local climatic conditions. Climate change adaptation is a broad topic which covers a number of aspects of site and building design. Adaptation is about designing buildings and sites to be fit for future climatic conditions as well as current conditions. It is widely recognised that there will be some degree of climate change in the next 50 years which is caused by anthropogenic CO₂ emissions, with the following potential impacts on the UK:

- Increased peak summer temperatures and milder winters
- Lower annual rainfall
- More intense storms including higher peak rainfall and winds.

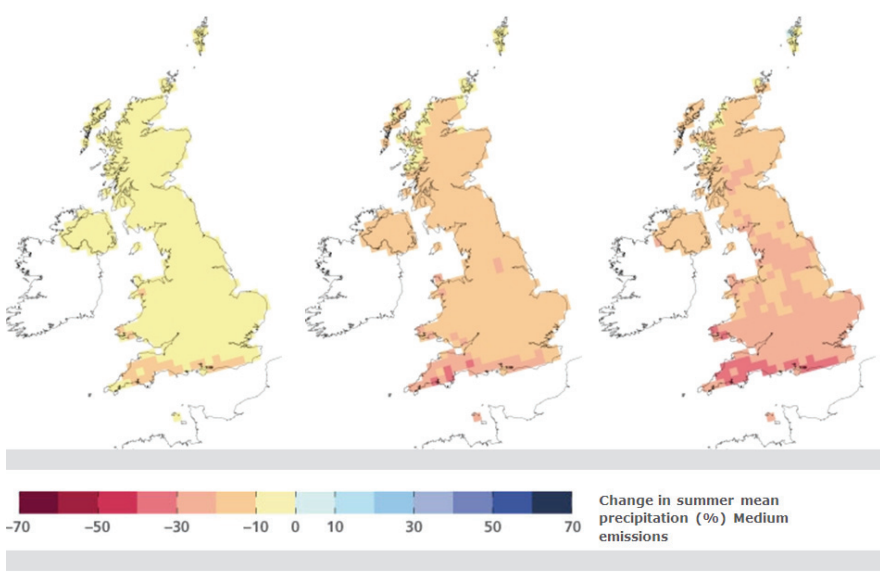
The impacts of these are fairly obvious – we need to design buildings which minimise overheating, which are able to withstand more adverse weather conditions, and which require less potable water.

Quantifying the potential climate change

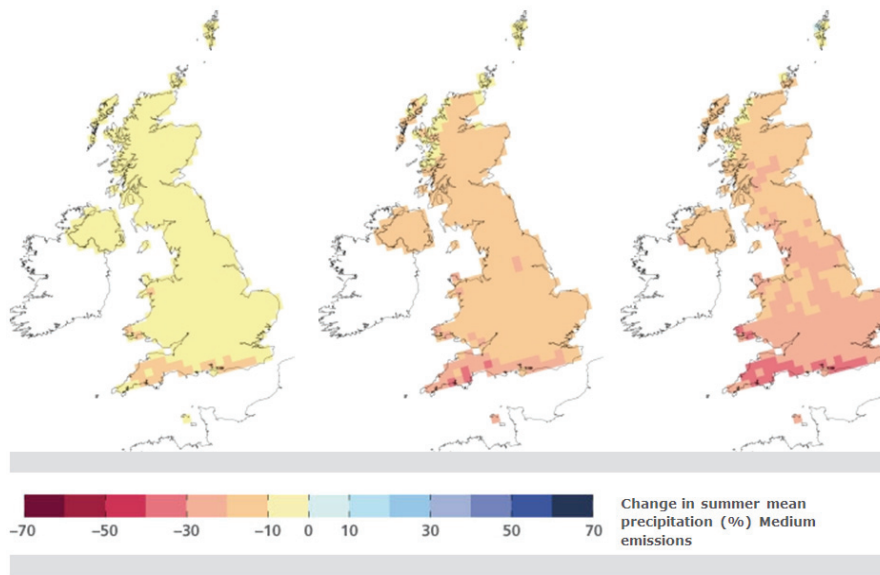
Detailed information about the major climatic changes expected in the UK is prepared by the UK Climate Impacts Programme (UKCIP) and is available as the UKCP09 (UK Climate Predictions 2009) climate change scenarios.

These climate projections, the fifth generation of climate information for the UK, have been developed to help understand the possible future climate; they are intended to inform practical decisions, helping society deal with the risks presented by climate change. The UKCP09 provides projections of climate change based on quantification of the known sources of uncertainty. UKCP09 does not provide a climate forecast, it provides a snapshot of the evidence for different potential climate scenarios which allows us to understand the likelihood of projected changes over three time slices (where 2020s is 2010-2039, 2050s is 2040-2069 and 2080s is 2070-2099) at particular locations and for given emissions scenarios.

The following maps show examples of central scenario projections for summer temperature and rainfall.



UKCIP projections for mean summer temperature in 2020s, 2050s, and 2080s. Data shown for the 50% probability level (central) for the medium emissions scenario. By the 2080s, average summer temperatures are predicted to be over 4 °C higher than now.



UKCIP projections for mean summer precipitation in 2020s, 2050s, and 2080s. Data shown for the 50% probability level (central) for the medium emissions scenario. By the 2080s, average summers will be up to 30% drier than now.

Higher summer temperatures

Higher summer temperatures could have two impacts on the built environment. Firstly higher peak temperatures may cause conditions which are uncomfortable for building residents with acceptable comfort criteria being exceeded on a regular basis. Secondly, higher temperatures (combined with lower annual rainfall) may affect ground conditions, and affect the structural stability of buildings and infrastructure. This second aspect is perhaps easier to cope with and requires foundations and infrastructure to be designed in such a way that they can cope with shifting ground conditions such as clay shrinkage. This will be assessed as part of the detailed design proposals for the Proposed Development.

Overheating presents more of a challenge and buildings need to be designed to provide natural ventilation and cooling to cope with higher summer temperatures for occupiers' comfort and investor confidence. Measures under consideration for the Proposed Development include:

- shallow plan and dual aspect buildings to allow cross ventilation. (This also means natural daylighting will be improved). Buildings will have sufficient areas of opening windows and secure shuttered ventilation to achieve this. Passive ventilation measures such as the inclusion of stack effect chimneys will be examined.
- Hard landscaping and building surface finishes with high albedo where beneficial to increase solar reflectivity. This means that less infrared radiation is absorbed. One simple way of doing this is to paint roofs white and use light coloured materials.
- The use of shading to reduce solar gains. Shading can be in a range of forms including external shutters, brise soleil, recessed windows, or natural vegetation (either growing up the building or neighbouring trees). Natural vegetation is particularly attractive because it can provide shading in the summer when required, but loss of leaves in the winter means better solar access. There is also the potential for evapo-transpiration to reduce external temperatures.
- High thermal mass buildings which provide a buffer to high daytime external temperatures.

To demonstrate that the design proposals function correctly at a detailed design stage, thermal modelling of buildings will use current climate data and also future weather data from the UK Climate Impacts Programme (UKCIP). The architect will be required to demonstrate that the designs are optimised for both and that the need for additional cooling has been minimised through passive design.



Brise soleil can be used to provide shading and minimise internal overheating. Natural stack ventilation is provided with vertical chimneys.



Internal shading and planting can be used to provide a cool pleasant environment for working.

Water supply

With lower annual levels of rainfall, water will become more scarce. In East Anglia, with already the lowest levels of rainfall in the UK, there will be a significant pressure on existing supplies.

The Proposed Development includes a number of features to reduce potable water demand:

- Water fittings and sanitary ware will be selected on the basis of low consumption, including dual flush toilets, aerated taps and showers, and intelligent water controls.
- Buildings will be designed to achieve high Code and BREEAM standards for water consumption resulting in design for 80 litres per person per day or less for all dwellings.
- Water will be metered for all buildings, via smart meters, allowing occupants and residents to monitor and observe water consumption.
- Greywater and rainwater systems will be installed on a per building or communal basis to reduce the demand on mains water.
- Water for irrigation purposes will be sourced from rainwater or greywater systems. Each house will be equipped with a rainwater butt where practicable.
- Any appliances provided will be designed for low water consumption. Green leases will require all residents and tenants to use only low consumption devices.



Aerated shower heads reduce water consumption whilst maintaining pressure.



Greywater recycling means that less freshwater is needed for non-potable demands.

More intense weather

Climate change may mean that the UK experiences more intense weather events, for example more intense storms with higher winds and peak rainfall. Both buildings and the wider site infrastructure will need to be designed to cope with these.

Buildings in the UK are currently designed with a large safety margin for wind loading and major structural failure is rare. However all the building designs will be required to demonstrate that they have considered increased wind loading on key components, for example shading devices, and that these are adequate for predicted future climatic conditions.

Predicted combinations of high wind and rainfall suggest that the building fabric will need to be impervious to driving rain. The use of roof overhangs and recessed windows would provide protection from driving rain and additional shading.

Predicted higher levels of winter rainfall suggest higher surface run-off and that flooding will result unless adaptation measures are incorporated. At a building scale, guttering and downpipes can be sized to allow for greater rainwater run-off to prevent damage to the structure. At the ground level, the use of Sustainable Urban Drainage Systems (SUDs) can provide a way of attenuating the run off. The following measures are proposed:

- Areas in the northern gravel-based part of the site will make use of permeable paving and landscaping to allow infiltration of rainwater.
- In the southern clay-based part of the site, a series of swales will provide a high capacity drainage system providing a buffer and increased levels of infiltration.
- Balancing ponds on the western edge will provide additional attenuation.

The end result is that surface run-off will be no greater than for the existing greenfield site for a 1 in 100 year event modelled on 2050 rainfall scenarios from UKCIP.



Extended eaves provide shelter against intense rainfall.



Swales can be used as part of a sustainable urban drainage strategy (SUDs) to attenuate run-off during intense rainfall.

**Appendix 2: Code for Sustainable Homes
and BREEAM**

Introduction

The North West Area Action Plan (NWAAP) policy 24 “Climate Change and Sustainable Design” sets out a number of design requirements for the Proposed Development in relation to sustainable design and construction. In particular the following sustainable construction standards are specified:

- 1. Code for Sustainable Homes. All dwellings built up to 2013 (for up to 50 dwellings) are required to meet Code for Sustainable Homes level 4 (Code 4) or higher. The 51st and subsequent dwellings prior to 2013 and all dwellings constructed post 2013 are required to meet Code 5 or higher.
- 2. Building Research Establishment Environmental Assessment Method (BREEAM). All non-domestic buildings are required to achieve a BREEAM rating of Excellent or higher.

The following section highlights the mandatory credits and likely credits required in order to meet Code Levels 4, 5 and 6 and BREEAM Excellent. In particular it highlights credits that will have an effect on the application proposals and that need to be thought about at this early stage of the developing design.

Many of the environmental issues covered by the Code and BREEAM will only become relevant once the detailed design of individual dwellings and buildings starts in conjunction with a developer.

For example, the Code gives credit for including energy efficient lighting and a clothes drying space within dwellings. Whilst these issues impact on capital cost they are not relevant to the overall masterplanning of the Application Site and can be incorporated at a later stage.

The following tables therefore briefly outline all of the credits considered at various levels of the Code and BREEAM in order to highlight which assumptions have been made for the credits that are not relevant to the design of the Proposed Development.



Code for Sustainable Homes – indicative credits

The following table shows indicative credits for the Code for Sustainable Homes assessment. This table has been developed based on the current Code for Sustainable Homes scheme (version November 2010). It is likely that the scheme will continue to change over the next few years and therefore the purpose of this table is to highlight where the application proposals support the current Code for Sustainable Homes and how a rating may be achieved.

Due to the difference in built form, houses (H) and flats (F) are shown separately. Credits which require consideration at masterplan stage are highlighted, and credits which are mandatory under the scheme are highlighted red.

ID	Issue (red = mandatory)	Level 4		Level 5		Level 6		Notes / Actions
		H	F	H	F	H	F	
ENERGY								
Ene 1	Dwelling Emission Rate	3	3	9	9	10	10	Credits will be achieved using a combination of gas fired CHP with district heating, and solar technologies where viable.
Ene 2	Fabric Energy Efficiency	5	5	7	7	8	8	To be addressed by developer and design team at detailed design
Ene 3	Energy Display Devices	2	2	2	2	2	2	To be addressed by developer and design team at detailed design
Ene 4	Drying Space	1	1	1	1	1	1	To be addressed by developer and design team at detailed design
Ene 5	Energy Labelled White Goods	2	2	2	2	2	2	To be addressed by developer and design team at detailed design
Ene 6	External Lighting	2	2	2	2	2	2	To be addressed by developer and design team at detailed design
Ene 7	Low and Zero Carbon Technologies	2	2	2	2	2	2	Gas CHP and high levels of solar technologies (PV and solar thermal) are proposed for all dwellings.
Ene 8	Cycle Storage	2	2	2	2	2	2	Cycle storage to be included which meets AAP standards and exceeds Code requirements.
Ene 9	Home Office	1	1	1	1	1	1	To be addressed by developer and design team at detailed design
WATER								
Wat 1	Indoor Water Use	3	3	5	5	5	5	Rainwater harvesting, grey water recycling, and efficient water fittings proposed for all dwellings.
Wat 2	External Water	1	1	1	1	1	1	Rain water harvesting combined with drought resistant planting where possible will minimise

ID	Issue (red = mandatory)	Level 4		Level 5		Level 6		Notes / Actions
	Use							external water use.
MATERIALS								
Mat 1	Environmental Impact of Materials	8	7	12	10	13	9	To be addressed by developer and design team at detailed design. Basic requirements are mandatory.
Mat 2	Responsible Sourcing of Materials – Basic Building Elements	3	3	3	3	4	4	To be addressed by developer and design team at detailed design
Mat 3	Responsible Sourcing of Materials – Finishing Elements	1	1	2	2	2	2	To be addressed by developer and design team at detailed design
SURFACE WATER RUN-OFF								
Sur 1	Management of Surface Water Run Off from developments	2	2	2	2	2	2	SUDs strategy consisting of infiltration and swales and balancing ponds proposed across whole site in compliance with Code requirements.
Sur 2	Flood Risk	2	2	2	2	2	2	The Application Site is situated in a zone with a low annual probability of flooding. 2 credits will therefore be awarded by default – pending flood risk assessment.
WASTE								
Was 1	Household Waste Storage and Recycling Facilities	4	4	4	4	4	4	The waste strategy provides sufficient storage of household waste to achieve maximum Code credits.
Was 2	Construction Site Waste Management	3	3	3	3	3	3	An outline SWMP is being submitted as part of the outline planning application, Full SWMPs will be required for each stage of development.
Was 3	Composting	1	1	1	1	1	1	Compostable waste collections are included in the waste strategy. In addition, on-site composing facilities will be provided in gardens and food preparation areas.

ID	Issue (red = mandatory)	Level 4		Level 5		Level 6		Notes / Actions
POLLUTION								
Pol 1	Global Warming Potential (GWP) of insulants	1	1	1	1	1	1	To be addressed by developer and design team at detailed design
Pol 2	NOx Emissions	3	3	0	0	2	2	To be determined at detailed design
HEALTH AND WELLBEING								
Hea 1	Daylighting	1	0	2	0	3	2	The site layout and indicative internal layouts aim to achieve a minimum daylight factor of 2% and 1.5% in the required areas. The third credit will be targeted in lower density areas.
Hea 2	Sound Insulation	3	3	4	4	4	4	To be addressed by developer and design team at detailed design.
Hea 3	Private Space	1	1	1	1	1	1	All dwellings will have access to private or shared gardens provided for specific residents.
Hea 4	Lifetime Homes	4	4	4	4	4	4	A proportion of dwellings will comply with the Lifetimes homes standards.
MANAGEMENT								
Man 1	Home User Guide	3	3	3	3	3	3	To be addressed by developer and design team at detailed design
Man 2	Considerate Constructors Scheme	2	2	2	2	2	2	To be addressed by developer and design team at detailed design
Man 3	Construction Site Impacts	2	2	2	2	2	2	To be addressed by developer and design team at detailed design
Man 4	Security	2	2	2	2	2	2	All dwellings to comply with secure by design principles with the input from an Architectural Liaison Officer or Crime Prevention Design Advisor.
ECOLOGY								
Eco 1	Ecological Value of Site	0	0	0	0	0	0	The site will not meet the criteria for being of low ecological value as it contains trees, hedgerows, ponds and a watercourse, and supports BAP habitats and species
Eco 2	Ecological Enhancement	1	1	1	1	1	1	Assuming acceptance of key recommendations and 30% of additional recommendations, this credit should be awarded

ID	Issue (red = mandatory)	Level 4		Level 5		Level 6		Notes / Actions
Eco 3	Protection of Ecological Features	0	0	0	0	0	0	Some mature trees and hedgerows may need to be removed (albeit not the species rich ones) and therefore this credit may not be achieved.
Eco 4	Change in Ecological Value	3	3	3	3	4	4	The credits to be awarded here will depend on the species diversity of new planting in comparison with that lost. Achieving 3 or 4 credits will require the provision of new planting to include a greater diversity of species.
Eco 5	Building Footprint	0	2	0	2	0	2	This credit will be achieved for some dwellings. Final proposals will identify whether an average footprint target can be achieved across the entire site.

Example code ratings

Changes to the Code will mean that the ratings are likely to alter in future versions. However to demonstrate that the dwellings can indicatively achieve the required levels, example assessments for levels 4 and 5 are illustrated in the tables below.

Code Level 4 Scoring Summary					AECOM	
Points Summary		Points Available	Target points (Houses)	Target points (Flats)		
Energy	Dwelling Emission Rate	11.7	3.5	3.5		
	Fabric energy efficiency	10.6	5.9	5.9		
	Energy display devices	2.3	2.3	2.3		
	Drying Space	1.2	1.2	1.2		
	Energy Labelled White Goods	2.3	2.3	2.3		
	External Lighting	2.3	2.3	2.3		
	Low or Zero Carbon Technologies	2.3	2.3	2.3		
	Cycle Storage	2.3	2.3	2.3		
	Home Office	1.2	1.2	1.2		
	Section Total	36.4	23.5	23.5		
Percentage of points achieved within this section			0.6	0.6		
Water	Indoor Water Use	7.5	4.5	4.5		
	External Water Use	1.5	1.5	1.5		
Section Total		9.0	6.0	6.0		
Percentage of points achieved within this section			0.7	0.7		
Materials	Environmental Impact of Materials	4.5	2.4	2.1		
	Responsible Sourcing of Materials - Basic Building Elements	1.8	0.9	0.9		
	Responsible Sourcing of Materials - Finishing Elements	0.9	0.3	0.3		
Section Total		7.2	3.6	3.3		
Percentage of points achieved within this section			0.5	0.5		
Surface Water	Management of Surface Water Run-off from developments	1.1	1.1	1.1		
	Flood Risk	1.1	1.1	1.1		
Section Total		2.2	2.2	2.2		
Percentage of points achieved within this section			1.0	1.0		
Waste	Storage of non-recyclable waste and recyclable household waste	3.2	3.2	3.2		
	Construction Site Waste Management	2.4	2.4	2.4		
	Composting	0.8	0.8	0.8		
Section Total		6.4	6.4	6.4		
Percentage of points achieved within this section			1.0	1.0		
Pollution	Global Warming Potential (GWP) of Insulants	0.7	0.7	0.7		
	NO _x Emissions	2.1	2.1	2.1		
Section Total		2.8	2.8	2.8		
Percentage of points achieved within this section			1.0	1.0		
Health & Wellbeing	Daylighting	3.5	1.2	0.0		
	Sound Insulation	4.7	3.5	3.5		
	Private Space	1.2	1.2	1.2		
	Lifetime Homes	4.7	4.7	4.7		
Section Total		14.0	10.5	9.3		
Percentage of points achieved within this section			0.8	0.7		
Management	Home User Guide	3.3	3.3	3.3		
	Considerate Constructors Scheme	2.2	2.2	2.2		
	Construction Site Impacts	2.2	2.2	2.2		
	Security	2.2	2.2	2.2		
Section Total		10.0	10.0	10.0		
Percentage of points achieved within this section			1.0	1.0		
Ecology	Ecological Value of the Site	1.3	0.0	0.0		
	Ecological Enhancement	1.3	1.3	1.3		
	Protection of Ecological Features	1.3	0.0	0.0		
	Change in Ecological Value of Site	5.3	4.0	4.0		
	Building Footprint	2.7	0.0	2.7		
Section Total		12.0	5.3	8.0		
Percentage of points achieved within this section			0.4	0.7		
Total Score		100.0	70.32	71.52		
TER Score			3.52	3.52		
Internal Water Consumption Score			4.50	4.50		
Total Points Scored			70.32	71.52		
Code for Sustainable Homes Rating			Level 4	Level 4		

Code level 5 Scoring Summary					AECOM	
Points Summary		Points Available	Target points (Houses)	Target points (Flats)		
Energy	Dwelling Emission Rate	11.7	10.6	10.6		
	Fabric energy efficiency	10.6	8.2	8.2		
	Energy display devices	2.3	2.3	2.3		
	Drying Space	1.2	1.2	1.2		
	Energy Labelled White Goods	2.3	2.3	2.3		
	External Lighting	2.3	2.3	2.3		
	Low or Zero Carbon Technologies	2.3	2.3	2.3		
	Cycle Storage	2.3	2.3	2.3		
	Home Office	1.2	1.2	1.2		
	Section Total	36.4	32.9	32.9		
Percentage of points achieved within this section			0.9	0.9		
Water	Indoor Water Use	7.5	7.5	7.5		
	External Water Use	1.5	1.5	1.5		
Section Total		9.0	9.0	9.0		
Percentage of points achieved within this section			1.0	1.0		
Materials	Environmental Impact of Materials	4.5	3.6	3.0		
	Responsible Sourcing of Materials - Basic Building Elements	1.8	1.2	1.2		
	Responsible Sourcing of Materials - Finishing Elements	0.9	0.6	0.6		
Section Total		7.2	5.4	4.8		
Percentage of points achieved within this section			0.8	0.7		
Surface Water	Management of Surface Water Run-off from developments	1.1	1.1	1.1		
	Flood Risk	1.1	1.1	1.1		
Section Total		2.2	2.2	2.2		
Percentage of points achieved within this section			1.0	1.0		
Waste	Storage of non-recyclable waste and recyclable household waste	3.2	3.2	3.2		
	Construction Site Waste Management	2.4	2.4	2.4		
	Composting	0.8	0.8	0.8		
Section Total		6.4	6.4	6.4		
Percentage of points achieved within this section			1.0	1.0		
Pollution	Global Warming Potential (GWP) of Insulants	0.7	0.7	0.7		
	NO _x Emissions	2.1	0.0	0.0		
Section Total		2.8	0.7	0.7		
Percentage of points achieved within this section			0.3	0.3		
Health & Wellbeing	Daylighting	3.5	2.3	0.0		
	Sound Insulation	4.7	4.7	4.7		
	Private Space	1.2	1.2	1.2		
	Lifetime Homes	4.7	4.7	4.7		
Section Total		14.0	12.8	10.5		
Percentage of points achieved within this section			0.9	0.8		
Management	Home User Guide	3.3	3.3	3.3		
	Considerate Constructors Scheme	2.2	2.2	2.2		
	Construction Site Impacts	2.2	2.2	2.2		
	Security	2.2	2.2	2.2		
Section Total		10.0	10.0	10.0		
Percentage of points achieved within this section			1.0	1.0		
Ecology	Ecological Value of the Site	1.3	0.0	0.0		
	Ecological Enhancement	1.3	1.3	1.3		
	Protection of Ecological Features	1.3	0.0	0.0		
	Change in Ecological Value of Site	5.3	4.0	4.0		
	Building Footprint	2.7	0.0	2.7		
Section Total		12.0	5.3	8.0		
Percentage of points achieved within this section			0.4	0.7		
Total Score		100.0	84.74	84.48		
TER Score			10.57	10.57		
Internal Water Consumption Score			7.50	7.50		
Total Points Scored			84.74	84.48		
Code for Sustainable Homes Rating			Level 5	Level 5		

Building Research Establishment Environmental Assessment Method (BREEAM)

There are a number of BREEAM schemes for different types of non domestic buildings. The schemes are largely similar, but with changes to account for the specific building uses. In addition, the credit structure changes within schemes depending on the design and scope of the building.

The following table demonstrates where the application proposals have been developed to help meet the BREEAM requirements across the main relevant schemes of Offices, Retail, Multi-Residential, Schools, and Healthcare. Due to the changing credit requirements within schemes, and the flexibility in meeting targets, individual credit ratings are not provided at the current stage.

Where a credit has a tick, the credit is applicable, and will be targeted as part of the scheme design. This will contribute towards a BREEAM Excellent rating.

ID	Issue (red = mandatory)	Offices	Retail	Multi-residential	Schools	Healthcare	Notes
MANAGEMENT							
M1	Commissioning	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
M2	Considerate Constructors	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
M3	Construction site impacts	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
M4	Building user guide	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
M5	Site investigation				✓		Early site investigations (including archaeological investigations) will comply with BREEAM requirements.
M6	Consultation				✓	✓	The consultation process will be BREEAM compliant.
M7	Shared facilities				✓	✓	To be addressed by developer and design team at detailed design
M8	Security	✓	✓	✓	✓	✓	All buildings to comply with secure by design principles with the input from an Architectural Liaison Officer or Crime Prevention Design Advisor.
M9	Publication of building information				✓		To be addressed by developer and design team at detailed design
M11	Ease of maintenance				✓	✓	To be addressed by developer and design team at detailed design

ID	Issue (red = mandatory)	Offices	Retail	Multi-residential	Schools	Healthcare	Notes
M12	Whole life costing				✓	✓	Credit to be targeted where possible and desirable.
M13	Good Corporate Citizen					✓	To be addressed by developer and design team at detailed design
HEALTH AND WELLBEING							
HW1	Daylighting	✓	✓	✓	✓	✓	Daylighting analysis to identify potential issues with daylighting for input to application proposals. 2% day-lighting will be targeted in all relevant areas.
HW2	View out	✓	✓	✓	✓	✓	Non-domestic buildings to make use of narrow floor plans where appropriate to allow a view out for all occupants. This will also assist with day-lighting and natural ventilation.
HW3	Glare control	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW4	High frequency lighting	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW5	Internal and external lighting levels	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW6	Lighting zones and controls	✓	✓		✓	✓	To be addressed by developer and design team at detailed design
HW7	Potential for natural ventilation	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW8	Indoor air quality	✓	✓	✓	✓	✓	Landscaping and site design will help provide buffer zones between buildings and car parks and roads. Where practicable air intakes will be located 20m from sources of external pollution.
HW9	Volatile organic compounds	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW10	Thermal comfort	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW11	Thermal zoning	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW12	Microbial contamination	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
HW13	Acoustic performance	✓	✓		✓	✓	To be addressed by developer and design team at detailed design

ID	Issue (red = mandatory)	Offices	Retail	Multi- residential	Schools	Healthcare	Notes
HW14	Office space		✓				To be addressed by developer and design team at detailed design
HW15	Outdoor space			✓		✓	To be addressed by developer and design team at detailed design
HW16	Drinking water				✓		To be addressed by developer and design team at detailed design
HW17	Specification of laboratory fume cupboards				✓		To be addressed by developer and design team at detailed design
HW18	Containment level 2 & 3 laboratory areas						To be addressed by developer and design team at detailed design
HW19	Arts in health					✓	To be addressed by developer and design team at detailed design
HW20	Home office			✓			To be addressed by developer and design team at detailed design
HW21	Sound insulation			✓			To be addressed by developer and design team at detailed design
ENERGY							
E1	Reduction of CO ₂ emissions	✓	✓	✓	✓	✓	The number of credits will depend on the individual building design, but the proposed energy strategy will result in a large number of credits being achieved to meet the mandatory requirements.
E2	Sub-metering of substantial energy uses	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
E3	Sub-metering of areas/tenancy	✓	✓			✓	To be addressed by developer and design team at detailed design
E4	External lighting	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
E5	Low or Zero Carbon Technologies	✓	✓	✓	✓	✓	The number of credits will depend on the individual building design, but the proposed energy strategy will result in a large number of credits being achieved to meet the mandatory requirements.
E6	Building fabric performance &		✓				To be addressed by developer and design team at detailed design

ID	Issue (red = mandatory)	Offices	Retail	Multi- residential	Schools	Healthcare	Notes
	avoidance of air infiltration						
E7	Cold storage		✓				To be addressed by developer and design team at detailed design
E8	Lifts	✓	✓		✓	✓	To be addressed by developer and design team at detailed design
E9	Escalators & travelling walkways	✓	✓				To be addressed by developer and design team at detailed design
E10	Free cooling				✓		To be addressed by developer and design team at detailed design
E11	Energy efficient fume cupboards				✓		To be addressed by developer and design team at detailed design
E12	Swimming pool covers				✓		To be addressed by developer and design team at detailed design. Only applicable if a swimming pool is built with the school.
E13	Labelled lighting controls						Not applicable to these schemes
E14	BMS						Not applicable to these schemes
E15	Provision of energy efficient equipment			✓		✓	To be addressed by developer and design team at detailed design
E16	CHP Community Energy					✓	A BREEAM compliant CHP study will be completed as part of the Carbon Reduction Strategy for each phase.
E17	Residential areas energy consumption						Not applicable to these schemes
TRANSPORT							
T1	Provision of public transport	✓	✓	✓	✓	✓	The number of credits will depend on the exact location of the building and relevant services. A large number will be targeted.
T2	Proximity to amenities	✓	✓	✓	✓	✓	This credit will be achievable for most of the site. For some areas, the availability of amenities will depend on viability.
T3	Cyclist facilities	✓	✓	✓	✓	✓	The proposed cycle facilities required by the AAP are in excess of BREEAM requirements.
T4	Pedestrian and cycle safety	✓	✓	✓	✓	✓	Footpaths and cycleways will be designed using the best practice guidance, details will be agreed with the highway authority as part of the reserved

ID	Issue (red = mandatory)	Offices	Retail	Multi- residential	Schools	Healthcare	Notes
							matters application
T5	Travel plan	✓	✓		✓	✓	A BREEAM compliant travel plan is being developed in support of the planning application.
T6	Maximum car parking capacity	✓		✓		✓	The parking strategy proposes stricter parking standards than specified in BREEAM.
T7	Travel information point		✓			✓	Real-time travel information to be provided throughout the site as part of the site intranet.
T8	Deliveries and manoeuvring		✓		✓	✓	Manoeuvring and delivery areas will reflect the vehicles anticipated to access the development.
WATER							
W1	Water consumption	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
W2	Water meter	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
W3	Major leak detection	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
W4	Sanitary supply shut off	✓	✓		✓	✓	To be addressed by developer and design team at detailed design
W5	Water recycling		✓	✓	✓	✓	Greywater and rainwater recycling are proposed for most buildings as part of the water strategy.
W6	Irrigation systems		✓	✓	✓	✓	Drought resistant planting combined with rainwater collection are proposed.
W7	Vehicle wash		✓				To be addressed by developer and design team at detailed design
MATERIALS							
MW1	Materials specification (major building elements)	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
MW2	Hard landscaping and boundary protection	✓	✓	✓	✓	✓	All materials will be selected partially on the basis of environmental impact.
MW3	Re-use of building façade						Not applicable to NWC.
MW4	Re-use of building structure						Not applicable to NWC.
MW5	Responsible sourcing of materials	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design

ID	Issue (red = mandatory)	Offices	Retail	Multi- residential	Schools	Healthcare	Notes
MW6	Insulation	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
MW7	Designing for robustness	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
MW8	Responsible sourcing of materials – finishing elements			✓			To be addressed by developer and design team at detailed design
WASTE							
WST1	Construction Site Waste Management	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
WST2	Recycled Aggregates	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
WST3	Storage of recyclable waste	✓	✓	✓	✓	✓	Site waste strategy proposed although some buildings may follow a separate strategy if more applicable to the specific building requirements.
WST4	Compactor / Baler		✓			✓	Credit to be targeted if compatible with the selected waste strategy for each building.
WST5	Composting		✓	✓		✓	Composting facilities proposed for the site including domestic and commercial areas.
WST6	Floor finishes	✓					To be addressed by developer and design team at detailed design
LAND USE AND ECOLOGY							
LE1	Re use of land						This credit will not be achievable since the land being built on is greenbelt.
LE2	Contaminated land						This credit is unlikely to be achieved as the land being built on is greenbelt.
LE3	Ecological value of site AND Protection of ecological features	✓	✓	✓	✓	✓	The site will not meet the criteria for being of low ecological value as it contains trees, hedgerows, ponds and a watercourse, and supports BAP habitats and species. In addition, some mature trees and hedgerows may need to be removed. Therefore this credit may not be achieved.
LE4	Mitigating ecological impact	✓	✓	✓	✓	✓	It should be possible to meet the criteria for 2 credits to be awarded
LE5	Enhancing site ecology	✓	✓	✓	✓	✓	It should be possible to meet the criteria for 2 credits to be awarded. It may be possible (dependent on the diversity of planting) to achieve 3 credits

ID	Issue (red = mandatory)	Offices	Retail	Multi- residential	Schools	Healthcare	Notes
LE6	Long term impact on biodiversity	✓	✓	✓	✓	✓	It should be possible to meet the criteria for 2 credits to be awarded
LE7	Consultation with students and staff				✓		To be addressed by developer and design team at detailed design
LE8	Local Wildlife Partnerships				✓		To be addressed by developer and design team at detailed design
POLLUTION							
P1	Refrigerant GWP - Building services	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
P2	Preventing refrigerant leaks	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
P3	Refrigerant GWP - Cold storage		✓		✓	✓	To be addressed by developer and design team at detailed design
P4	NOx emissions from heating source	✓	✓	✓	✓	✓	To be determined at detailed design.
P5	Flood risk	✓	✓	✓	✓	✓	It is understood that the Application Site is situated in a zone with a low annual probability of flooding. 2 credits will therefore be awarded by default – pending flood risk assessment. Note: A small parcel of land to the north-west of the site has a medium risk of flooding and may affect the number of credits for buildings if constructed in this area.
P6	Minimising watercourse pollution	✓	✓	✓	✓	✓	SUDs system proposed will meet this credit.
P7	Reduction of night time light pollution	✓	✓	✓	✓	✓	To be addressed by developer and design team at detailed design
P8	Noise attenuation	✓	✓		✓	✓	To be addressed by developer and design team at detailed design

Appendix 3: Policy review – setting a sustainability framework

Legal Drivers

The challenge of climate change and the need to stabilise CO₂ levels in the atmosphere whilst enabling sufficient growth to support the UK's growing population has intensified. There is now a comprehensive range of legislation and policy at various scales which support the design and implementation of measures and approaches to ensure new development is sustainable and 'low carbon' as a result of energy efficiency measures and appropriate selection of energy sources.

The UK **Climate Change Act (2008)** sets a legally binding target for reducing UK CO₂ emissions by at least 80% by 2050. The Act is supported by the **UK Low Carbon Transition Plan (2009)**, which sets out the UK's approach to meeting our carbon reduction commitments. Most recently, the Government has accepted the Committee on Climate Change's 4th carbon budget recommendations which cover the period 2022 – 2027. These set a CO₂ reduction target in law of 50% reduction by 2027 from 1990 levels.

Part L of the Building Regulations requires that CO₂ emissions calculated for a new development should be equal to or less than a Target Emission Rate.

Following the "Building a Greener Future: Towards Zero Carbon development" consultation, the Government announced in July 2007 that all new homes will be designed to be zero carbon from 2016. The following interim changes to the Building Regulations for homes are likely to be introduced:

- 2010 - 25% improvement in regulated emissions (relative to 2006 levels). This corresponds with the mandatory energy and CO₂ standards for Level 3 of the Code for Sustainable Homes. (Introduced in Oct 2010)
- 2013 - 44% improvement in regulated emissions (relative to 2006 levels), corresponding to Code Level 4 mandatory energy and CO₂ standards.



The 2010 Part L update only applies to emissions that are directly associated with the dwelling and are regulated (heating, ventilation, cooling and lighting). From 2016, the requirements will apply to all emissions associated with energy use in the dwelling, including cooking and other appliances (referred to as unregulated emissions). Non-domestic buildings will be expected to achieve zero carbon emissions from 2019.

A further consultation in 2008, followed by a Government statement in July 2009 further described the definition of zero carbon that will be applied to new homes and sets out how it will be taken forward through the 'zero carbon hierarchy'.

Most recently, in the March 2011 budget the government committed to the Zero Carbon Hub's recommendations for carbon compliance. This sees the carbon compliance target differentiated between dwelling types and reduced overall to reflect the difficulties faced by some sites in meeting 70%. The government also announced in the budget that the unregulated emissions will be removed from the definition of zero carbon.

The **Planning and Compulsory Purchase Act (2004)** placed sustainable development at the heart of the planning system.

The key national planning policies in relation to climate change and sustainable development are set out below.

The **Localism Bill** currently before Parliament introduces the proposed National Planning Policy Framework which, in turn, places sustainable

development at the heart of both planning policy and decision taking by creating a presumption in favour of sustainable development.

Planning Policy Statement 1: Delivering Sustainable Development, January 2005

The PPS sets out three objectives for the planning system: sustainable development; spatial planning; and community engagement. The overarching aim of the PPS is to ensure new development brings benefit by:

- Providing improved access for all to jobs, health, education, shops, leisure and community facilities, open space, sport and recreation, by ensuring that new development is located where everyone can access services or facilities on foot, bicycle or public transport rather than having to rely on access by car.
- Reducing the need to travel and encouraging accessible public transport provision to secure more sustainable patterns of transport development.
- Promoting the more efficient use of land through higher density, mixed use development.

In addition, PPS1 leads on design policy and puts forward a number of key objectives to ensure that developments:

- are sustainable, durable and adaptable (including taking account of natural hazards such as flooding) and make efficient and prudent use of resources;
- optimise the potential of the site to accommodate development, create and sustain an appropriate mix of uses (including incorporation of green and other public space as part of developments) and support local facilities and transport networks;
- respond to their local context and create or reinforce local distinctiveness;
- create safe and accessible environments where crime and disorder or fear of crime does not undermine quality of life or community cohesion;
- address the needs of all in society and are accessible, usable and easy to understand by them; and
- are visually attractive as a result of good architecture and appropriate landscaping.

Planning Policy Statement: Planning and Climate Change Supplement to PPS 1, December 2007

The supplement to PPS1 expects new development to consider its environmental performance and take particular account of the climatic changes likely to be experienced over its expected lifetime. The guidance puts forward a number of principles including the following:

- New development should take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption, including maximising cooling and avoiding solar gain in the summer; and, overall, be planned so as to minimise CO₂ emissions;
- New development should be planned to make good use of opportunities for decentralised and renewable or low carbon energy;
- New development should be planned to minimise future vulnerability in a changing climate. Mitigation and adaptation should not be considered independently of each other, and new development should be planned with both in mind;
- Public and private open space should be provided as appropriate so that it offers accessible choice of shade and shelter, recognising the opportunities for flood storage, wildlife and people provided by multifunctional greenspaces;
- Priority should be given to the use of sustainable drainage systems, paying attention to the potential contribution to be gained to water harvesting from impermeable surfaces and encourage layouts that accommodate waste water recycling;
- New development should provide for sustainable waste management; and
- Opportunities for sustainable transport should be secured in line with Planning Policy Guidance (PPG) 13”

Draft PPS: Planning for a Low Carbon Future in a Changing Climate

A draft replacement for PPS 22 and the PPS 1 Supplement on Planning and Climate Change was published for consultation on 9th March 2010. The draft PPS represents an evolution in the way planning deals with climate change and focuses strongly on the role of district heating in helping to reduce urban CO₂ emissions as well as designing in adaptive measures to ensure resilience to the impacts of climate change.

Note: At the time of writing the results of the consultation have not yet been published and the policy decisions based on the outcome of the consultation are yet unknown.

Planning Policy Statement 22: Renewable Energy, August 2004

PPS 22 sets out the UK's policies for renewable energy, which planning authorities should have regard to when making planning decisions. Although due to be replaced by an updated PPS, the guidance is currently still applied as a material consideration and sets out a number of key principles to promote the consideration and implementation of renewable energy projects.

Floods and Water Management Act 2010

The aim of the Act is to provide better, more comprehensive management of flood risk for people, homes and businesses. The main responsibilities of the Act will lie with local authorities. A key feature of the Act is encouragement of the uptake of sustainable drainage systems by providing for unitary and county councils to adopt Sustainable Drainage Systems (SUDS) for new developments and redevelopments.

Planning Policy Statement 25: Development and Flood Risk, December 2006

PPS25 outlines the UK's approach on development and flood risk, and seeks to ensure that flood risk is taken into account at all stages in the planning process.

The key objective of PPS 25 is to deliver sustainable development by appraising flood risk, managing flood risk and reducing flood risk. Flood risk to and from new development must be reduced through location, layout and design and incorporate SUDS.

UK Waste Strategy for England 2007

Produced by Defra, this and other UK policy, legislation and regulations result in obligations on local authorities and on businesses to manage and handle waste more safely and sustainably. Key objectives of the waste strategy are to reduce the amount of waste going to landfill through promoting waste minimisation, reuse and recycling. Although not produced as national planning guidance, this strategy is a key driver in the development of local policies and targets for waste reduction.

Planning Policy Statement 10: Planning for Sustainable Waste Management, July 2005

The key objective of PPS 10 is to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Through more sustainable waste management and the use of the ‘waste hierarchy’, the Government aims to break the link between economic growth and the environmental impact of waste.

Policy Statement 9: Biodiversity and Geological Conservation, August 2005

This guidance sets out planning policies on protection of biodiversity and geological conservation through the planning system. PPS 9 is due to be

replaced by an updated PPS, described below; but remains as a material consideration until that point.

Draft Planning Policy Statement: Planning Natural and Healthy Environments

This is a consultation document on a new planning policy statement on planning for the natural environment, green infrastructure, open space, sport, recreation and play. In its final form this PPS will replace PPS 9: Biodiversity and Geological Conservation, and a number of other PPSs. A new policy (*Policy NE4: Local planning approach for green infrastructure*) has been proposed in regards to the use of green infrastructure in new development. In summary new development should:

- provide for green infrastructure, particularly in locations where it will assist in reducing the impacts of climate change by providing flood water storage areas, sustainable drainage systems, urban cooling and local access to shady outdoor space;
- avoid development being located in areas which result in the fragmentation or isolation of natural habitats;
- identify opportunities to enhance green infrastructure and the natural habitats within it, by retaining, enhancing or creating green corridors linking rural and urban fringe areas and urban green spaces; and
- identify opportunities to enhance the functions urban green spaces can perform.

Planning Policy Statement 23: Planning and Pollution Control, November 2004

PPS23 is intended to complement the new pollution control framework under the *Pollution Prevention and Control Act 1999* and the *PPC Regulations 2000*. This PPS advises that consideration should be made to the quality of land, air or water and the potential impacts arising from development.

Planning Policy Statement 5: Planning for the Historic Environment, March 2010

This PPS sets out the role planning and new development have in conserving our heritage assets and historic environments whilst delivering sustainable development and addressing climate change. In particular, guidance is provided on the positive role historic environments can play in place-shaping and the establishment and maintenance of sustainable communities. It also addresses planning issues in regards to climate change mitigation and adaptation and the interaction with historic buildings or environments.

Planning Policy Guidance 13: Transport, April 2001

The emphasis in PPG 13 is the integration of transport and land use planning. The aim is to reduce growth in the length and number of motorised journeys, encourage alternative means of travel which have less environmental impact and reduce reliance on the private car. The policy sets out the following key objectives:

- Promote more sustainable transport choices both for people and for moving freight;
- Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling;
- Reduce the need to travel, especially by car.

[Planning Policy Statement 3: Housing, November 2006](#)

PPS3 sets out the national planning policy framework for delivering the UK's housing objectives. The main emphasis of the PPS is the design and delivery of high quality new housing which contributes to the creation of sustainable, mixed communities across the wider local authority area as well as at neighbourhood level.

[Regional Policy](#)

The adopted East of England Plan 2008 is the Regional Strategy for the East of England region of which Cambridge forms part. The recently published Localism Bill provides for the abolition of Regional Strategies and is expected to be enacted in November 2011; although the abolition of individual Regional Strategies is not expected to take effect until the consequence of abolition has been the subject of Strategic Environmental Assessment. Until the East of England Plan is formally abolished it remains, therefore, part of the statutory Development Plan. At the time of writing, decisions must be in accordance with the statutory Development Plan unless material considerations require otherwise. In the meantime, LPAs are entitled to take account of the Government's intention to abolish Regional Strategies as a material consideration. For this reason the relevant policies of the East of England Plan are rehearsed below.

It should be noted that with the change of Government in May 2010, regional powers are in the process of being abolished which will probably result in the removal of regional level policy relating to planning and development. However planning policy under the previous Government informed the preparation of the AAP which is the principal planning guidance. Since the AAP still provides the overall planning context for the Application Site, the following discussion of policy is still relevant.

[East of England Regional Assembly – The Regional Spatial Strategy](#)

Regional Spatial Strategies are the top tier of the Statutory Development Plan in all regions of England and have the specific objective of contributing to sustainable development.

The East of England Regional Spatial Strategy provides the framework for local planning policy in response to the following identified sustainability drivers:

- Putting in place a framework that promotes sustainable development, especially to address housing shortages, support the continued growth of the economy and enable all areas to share in prosperity, whilst driving up energy efficiency and carbon performance, improving water efficiency and recycling an increasing percentage of waste;
- Reconciling growth with protection of the environment and avoiding adverse effect on sites of European or international importance for nature conservation;
- Concentrating growth at the key centres for development and change, which include all the region's main urban areas and have potential to accommodate substantial development in sustainable ways to 2021 and beyond, whilst maintaining the general extent of the green belt;

[The Revision to the Regional Spatial Strategy for the East of England, the East of England Plan \(May 2008\)](#)

Following proposed changes to the Draft Regional Spatial Strategy in December 2006, Policy ENV8 has been revised and strengthened by splitting it into policies ENG1 and ENG2:

Policy ENG1: *Carbon Dioxide Emissions and Energy Performance* states that local authorities should:

- Encourage the supply of energy from decentralised, renewable and low carbon energy sources and through Development Plan Documents set ambitious but viable proportions of the energy supply of new development to be secured from such sources and the development thresholds to which such targets would apply. In the interim, before targets are set in Development Plan Documents, new development of more than 10 dwellings or 1000m² of non-residential floor space should secure at least 10% of their energy from decentralised and renewable or low carbon sources, unless this is not feasible or viable;
- Promote innovation through incentivisation, master planning and development briefs which, particularly in key centres for development and change, seek to maximise opportunities for developments to achieve, and where possible exceed national targets for the consumption of energy. To help realise higher levels of ambition local authorities should encourage energy service companies (ESCOs) and similar energy saving initiatives.

Policy ENG2: *Renewable Energy Targets* states that:

- The development of new facilities for renewable power generation should be supported, with the aim that by 2010 10% of the region's

energy and by 2020 17% of the region's energy should come from renewable sources. These targets exclude energy from offshore wind, and are subject to meeting European and international obligations to protect wildlife, including migratory birds, and to revision and development through the review of this RSS

[Local Policy Drivers](#)

On abolition of the East of England Plan, Local Plans incorporating neighbourhood plans where relevant, will be the statutory Development Plan for the determination of any planning application. The presumption in favour of sustainable development within the NPPF will require that development proposals that accord with statutory plans should be granted planning consent without delay; and where the plan is absent, silent, indeterminate or where relevant policies are out of date planning permission should still be granted unless the adverse impacts of allowing development would significantly and demonstrably outweigh the benefits, when assessed against the policies in the NPPF taken as a whole. The local statutory development plan covering the area of the Application Site comprises the North West Cambridge Area Action Plan (AAP), South Cambridgeshire District Council Core Strategy and related local development documents and Cambridge City Local Plan. The Area Action Plan is up to date and is the central policy document in relation to this Proposed Development forming part of the Councils' Local Development Framework

[North West Area Action Plan](#)

The main local policy guiding the Application Site proposals is the Area Action Plan (AAP) Development Plan Document which was adopted in October 2009.

The AAP sets challenging targets for sustainability in its NW1 policy and this vision continues throughout the document. Key objectives of the AAP are:

- [b\) To create a sustainable community](#)
- [c\) To make the best use of energy and other natural resources, to be built as an exemplar of sustainable living with low carbon and greenhouse gas emissions and be able to accommodate the impacts of climate change.](#)

[\(NW1 objectives\)](#)

Urban design is of importance in developing a sustainable community and this appears in a number of places in the AAP:

[Land between Madingley Road and Huntingdon Road, comprising two areas totalling approximately 91ha, as shown on the Proposals Map, is allocated for predominantly University-related uses. A strategic gap is retained between the two parts of the site to ensure separation is maintained between Cambridge and Girton village and to provide a central](#)

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Building Engineering		
<p><i>open space for reasons of biodiversity, landscape, recreation and amenity, whilst ensuring a <u>cohesive and sustainable form of development</u>. Development will create a high quality built edge to the urban area and provide an appropriate setting to Cambridge that maintains the purposes of the Cambridge Green Belt. Any land not required for development by 2016 will be safeguarded for predominantly University-related development for the period post-2016 to meet the longer-term development needs of Cambridge University.</i></p>		
<p>(NW4: Site and Setting)</p>		
<p><i>1. Affordable housing will be intermingled with the market housing in small groups or clusters, whilst the student housing can be provided in a number of groups distributed across each phase of development;</i></p> <p><i>2. A suitable mix of house types, sizes and tenure (including affordable housing) will be provided, attractive to and meeting the needs of all ages and sectors of society including those with disabilities. This should include a proportion of new homes designed to Lifetime Home Mobility Standards. The mix in each particular development will be determined by evidence at the time of planning permission, including housing need, development costs and viability, <u>and the achievement of mixed and balanced communities</u>.</i></p>	<p>Cambridge is has particular travel characteristics with a large proportion of social trips and commuting using walking, cycling, and public transport. Developing a sustainable transport strategy for the site is important and recognised in the AAP:</p> <p><i>Development and transport systems will be planned in order to reduce the need to travel and maximise the use <u>of sustainable transport modes</u> to encourage people to move about by foot, cycle and bus, to achieve a modal share of no more than 40% of trips to work by car (excluding car passengers). This will include the provision of car clubs, employee travel plans, residential travel planning, and other similar measures.</i></p> <p>(NW11: Sustainable Travel)</p> <p><i>A new route will be developed linking Madingley Road and Huntingdon Road. This road will be designed as part of the development and its design will be based on low vehicle speeds. It will give priority to provision for walking, cycling and public transport, including safe and convenient crossings for pedestrians and <u>cyclists, in order to encourage travel by more sustainable modes</u>.</i></p> <p>(Policy NW14: Madingley Road to Huntingdon Road Link)</p>	<p><i>b) Giving priority to cycling within the development, including connections to key destinations, including the local centre, bus stops, the primary schools, employment, and adjacent development; and</i></p> <p><i>c) Linking the development with the surrounding walking and cycling network and orbital routes including links to nearby villages and open countryside.</i></p> <p>(Policy NW17: Cycling Provision)</p> <p><i>Development will be required to provide attractive, direct and safe walking routes as part of the development, including:</i></p> <p><i>a) Giving priority to walking links between Huntingdon Road and Madingley Road, to adjacent development and to the City Centre;</i></p> <p><i>b) Giving priority to walking routes within the development connecting to key destinations, including the local centre, bus stops, the primary schools and employment; and</i></p> <p><i>c) Linking the development with the surrounding walking network, including links to an improved rights of way network and to nearby villages and open countryside.</i></p> <p>(Policy NW18: Walking Provision)</p>
<p>(NW7: Balanced and Sustainable Communities)</p>		
<p><i>1. The development will provide an appropriate level and type of high quality services and facilities in suitable locations to serve all phases of development. In order to identify the appropriate level, detailed assessments and strategies will be required to be prepared with key stakeholders prior to granting planning permission;</i></p> <p><i>2. Where appropriate, those services and facilities delivered by the community or voluntary sector will be provided by the development of appropriate serviced land, e.g. faith, social and sporting clubs.</i></p>	<p><i>High quality public transport provision will be provided to support development, including:</i></p> <p><i>a) Providing segregated bus priority routes through the development, along internal routes;</i></p> <p><i>b) Linkage of bus routes within the development to the wider bus network, including enhanced bus services along Huntingdon Road and the proposed Madingley Road to Huntingdon Road link route;</i></p> <p><i>c) Provision of bus stops, shelters and real time passenger information, with the majority of development being within 400m easy walking distance of a bus stop; and</i></p> <p><i>d) Support for residential travel plans and employee travel plans, including measures to encourage bus use, funded by development.</i></p> <p>(Policy NW16: Public Transport Provision)</p>	<p><i>Car and cycle parking will be provided in accordance with the standards set out in Appendix 1 and 2. In applying these standards, the overall aim will be to minimise the amount of car parking and to maximise the amount of cycle parking in order to encourage the use of more sustainable modes.</i></p> <p>(Policy NW19: Parking Standards)</p>
<p>(Policy NW20: Provision of Community Services and Facilities, Arts and Culture.)</p>		
<p><i>Where appropriate, all services and facilities will be provided in a single centre at the heart of the development and adjacent to the strategic gap, well served by public transport and a cycle path network, and within reasonable walking distance of all parts of the development.</i></p>	<p><i>New and improved cycle links will be provided as part of the development, including:</i></p> <p><i>a) Giving priority to cycling links between Huntingdon Road and Madingley Road and to the City Centre;</i></p>	<p>The Application Site is predominantly a green field area comprising farmland which has been removed from the Green Belt for the purposes of the development; although a proportion on the land remains as Green Belt. Therefore in order to manage the altered regime for surface water drainage, it will include forms of sustainable urban drainage. The AAP provides:</p> <p><i>1. Surface water drainage for the site should be designed as far as possible as a sustainable drainage system (SUDS) to reduce overall run-off volumes leaving the site, control the rate of flow and improve water quality before it joins any water course or other receiving body;</i></p> <p><i>2. The surface water drainage system will seek to hold water on the site, ensuring that it is released to surrounding water courses at an equal, or slower, rate than was the case prior to development;</i></p>
<p>(Policy NW21: A Local Centre)</p>		

- 3. *Water storage areas should be designed and integrated into the development with drainage, recreation, biodiversity and amenity value; and*
- 4. *Any surface water drainage scheme will need to be capable of reducing the downstream flood risk associated with storm events as well as normal rainfall events. All flood mitigation measures must make allowance for the forecast effects of climate change.*

(Policy NW25: Surface Water Drainage)

The areas of sustainability with potentially the largest focus are those of energy and carbon dioxide emissions and of building standards. Policy NW24 “Climate change and sustainable design and construction” is the main policy which drives the physical design of sustainability measures at the Proposed Development.

In particular the following sustainable construction standards are specified:

- 1. Code for Sustainable Homes (Code). All dwellings built up to 2013 (for up to 50 dwellings) are required to meet Code level 4 or higher. The 51st and subsequent dwellings prior to 2013 and all dwellings post 2013 are required to meet Code level 5.
- 2. Building Research Establishment Environmental Assessment Method (BREEAM). All non domestic buildings are required to achieve a BREEAM rating of Excellent.

- 1. *Development will be required to demonstrate that it has been designed to adapt to the predicted effects of climate change;*
- 2. *Residential development will be required to demonstrate that:*
 - a. *All dwellings approved on or before 31 March 2013 will meet Code for Sustainable Homes Level 4 or higher, up to a maximum of 50 dwellings across the site. All dwellings above 50 will meet Code for Sustainable Homes Level 5 or higher (these Levels include water conservation measures);*
 - b. *All dwellings approved on or after 1 April 2013 will meet Code for Sustainable Homes Level 5 or higher;*
 - c. *There is no adverse impact on the water environment and biodiversity as a result of the implementation and management of water conservation measures.*
- 3. *Non residential development and student housing will be required to demonstrate that:*
 - d. *It will achieve a high degree of sustainable design and construction in line with BREEAM “excellent “ standards or the equivalent if this is replaced;*
 - e. *It will reduce its predicted carbon emissions by at least 20% through the use of on-site renewable energy technologies only where a renewably fuelled decentralised system is shown not to be viable;*

- f. *It will incorporate water conservation measures including water saving devices, grey water and/or rainwater recycling in all buildings to significantly reduce potable water consumption; and*
- g. *There is no adverse impact on the water environment and biodiversity as a result of the implementation and management of water conservation measures.*
- 4. *Decentralised energy will be required at NWC to meet the targets specified above. The form of decentralised energy system to be used will be determined on the basis of minimising carbon and greenhouse gas emissions. The system will need to serve the whole site unless there are specific circumstances which would render it inappropriate.*

The above requirements are subject to wider viability testing.

(Policy NW24: Climate Change & Sustainable Design and Construction)

Finally, the process of construction itself should adopt best practice with respect to sustainability. Construction is responsible for a large proportion of the UK waste production, and can also cause considerable disruption to local residents if it is poorly planned. The area action plan specifically addresses these points:

Where practicable the development will:

- a. *Recycle construction waste;*
- b. *Accommodate construction spoil within the development, taking account of the local urban and landscape character and avoiding creation of features alien to the topography;*
- c. *Maximise the reuse and recycling of any suitable raw materials currently available on site during construction, such as redundant buildings or infrastructure;*
- d. *Avoid disruption to adjacent parts of the City and Girton.*

(Policy NW28: Construction Process)

Other local policy and guidance

As noted above, the AAP is the key local policy document which guides the development and other local policy does not have statutory powers over the Application Site.

However an important document which can be used as additional guidance is the Cambridge City Council ‘Sustainable Design and Construction’ Supplementary Planning Document (SPD) adopted in June 2007.

This document lays down the principles of sustainable design in the context of Cambridge and provides design advice on how these can be met. The document is split into ‘essential’ considerations, and ‘recommended’ considerations, the latter being applicable for large sites.

In this sustainability statement, the relevant elements of the Sustainable Design and Construction SPD and sustainability checklist are referenced in each section to show how the relevant issues have been addressed.

Environmental assessment methodologies

Code for Sustainable Homes

The Code for Sustainable Homes is an environmental assessment system for new housing in England which was introduced in April 2007 based on BRE’s EcoHomes scheme. The Code assesses a development against a set of criteria under nine key categories. The Code awards a rating to each dwelling type within the development based on a scale of level one to six (denoted by stars) – six being the highest. The rating depends on whether the dwellings meet a set of mandatory standards for each level, as well as an overall score.

Mandatory requirements exist under the following credits:

- Energy and CO₂
- Water
- Embodied Impacts of Construction Materials;
- Surface Water run-off;
- Construction Site Waste Management;
- Household Waste Storage Space and Facilities.

The biggest influence on the cost of Code compliance is the mandatory CO₂ reduction target. Following the update to the Code in 2010 this has been streamlined with Building Regulations such that the CO₂ requirements of Code level 3 is now mandatory under Part L of the Building Regulations in 2010, Code level 4 CO₂ requirements will likely be mandatory in 2013, and Code level 5 CO₂ requirements will be mandatory under the Building Regulations in 2016 (i.e. ‘zero carbon homes’). Another notable mandatory requirement which is identified in the AAP is for internal water consumption, with a target of 80 litres per person per day for Code levels 5 and 6. The energy and water targets for the current 2010 version of the Code are shown in the tables below:

Code Level	Minimum Percentage Improvement in Dwelling Emission Rate over Target Emission Rate
Level 1 (★)	0% (Compliance with Part L 2010 only is required)
Level 2 (★★)	0% (Compliance with Part L 2010 only is required)
Level 3 (★★★)	0% (Compliance with Part L 2010 only is required)
Level 4 (★★★★)	25%
Level 5 (★★★★★)	100%
Level 6 (★★★★★★)	Net Zero CO ₂ Emissions

Code Level	Maximum Indoor Water Consumption in Litres per Person per Day
Level 1 (★)	120
Level 2 (★★)	120
Level 3 (★★★)	105
Level 4 (★★★★)	105
Level 5 (★★★★★)	80
Level 6 (★★★★★★)	80

All homes on the Application Site are required to meet Code level 5 or above (apart from the first 50 units if built before 2013).

BREEAM
The Building Research Establishment Environmental Assessment Method (BREEAM) is similar to the Code in that it provides an overall rating for a building based on performance against different credits. Ratings are given from Pass to Outstanding. BREEAM is the most established assessment scheme for non-domestic buildings in the UK although there are other schemes available with a similar assessment and credit structure which are also used in the UK.

The AAP requires all non domestic buildings to achieve a BREEAM rating of Excellent. This will impose constraints on maximum CO₂ emissions and other constraints where the achievement of credits is either mandatory or a minimum standard must be attained.

For both BREEAM and the Code, certificates are issued by independent accredited assessors. An outline assessment of the factors affected at the masterplan design stage has been conducted and is referenced in this statement. It is important to note that the assessment criteria will almost certainly change during the build out of the Proposed Development and the detailed proposals may need to respond to these changes.

Appendix 4: Cambridge City Council Sustainable Design and Construction SPD Checklist

This section provides a completed version of the Sustainability Checklist from the Cambridge City Council Sustainable Design and Construction SPD, 2007. The checklist has been completed for all Outline Planning considerations.

Theme	Checklist	Comment	Location within statement
Transport	Have you demonstrated that the development is in the most suitable location for access by public transport, walking and cycling?	The Proposed Development is located within the site identified in the AAP. The central location of the site enables use of public transport, cycling, and walking.	Principle 10: Transport and mobility
	Have you demonstrated how the design of the development helps reduce the need to travel, especially by private car?	The transport strategy contains a number of proposals to reduce the use of private cars and increase sustainable transport modes.	Principle 10: Transport and mobility
	Do the development proposals for walking and cycling link with the surrounding walking and cycling network?	A number of links are proposed to existing networks, providing routes into, and out of, the city.	Principle 10: Transport and mobility
	Are existing walking and cycling routes retained, and improved where possible?	Existing public access routes are maintained, and the development proposals increase the amount of open space available to residents.	Principle 10: Transport and mobility
	Will the proposed walking and cycling provision be in place by first occupation of the development so that sustainable travel patterns can be established at an early stage?	The transport facilities will be phased over the lifetime of the development, with significant investment in infrastructure in the first phase to ensure sustainable travel modes are available from the outset.	Principle 10: Transport and mobility
	Do the development proposals provide cycle parking in accordance with the Local Plan Parking Standards (Local Plan Appendix D), in number, location and design?	Cycle storage numbers proposed are in line with Local Plan Parking Standards, the NW AAP, and Code for Sustainable Homes and BREEAM standards. Design will be in compliance with the requirements.	Principle 10: Transport and mobility
	What is the car parking strategy?	This varies across the site for different land uses, but is in compliance with the NW AAP parking standards.	Principle 10: Transport and mobility

Theme	Checklist	Comment	Location within statement
	Does the transport provision conform to established good practice, particularly in terms of wildlife and landscape factors, so that any adverse impact is minimised?	The transport strategy takes a holistic approach to reduce the overall impact of transportation	Principle 10: Transport and mobility
	Have any 'softer' measures been included, to encourage uptake of more sustainable modes of transport?	A number of measures are proposed to help change residents behaviour, and stimulate sustainable transport modes. These include provision of car share and car club schemes.	Principle 10: Transport and mobility
	Does the development inhibit the expansion of high quality public transport routes?	The development promotes the creation of new high quality public transport routes, and supports Cambridge-wide public transport proposals.	Principle 10: Transport and mobility
	Are the development proposals accessible to those with impaired?	Access for impaired will be catered for and considered in detail at detailed design.	Principle 10: Transport and mobility Principle 13: Inclusion
	For non-residential proposals likely to attract a large number of trips, has the sequential approach been followed? (i.e. preference is given to a more central location)	Not applicable to the Proposed Development as the site is defined by the AAP, and alternative locations are not available for this development.	
	If appropriate, has proper consideration given to the potential for movement of goods and materials by rail or water?	Not applicable.	
	If the development is within an urban extension area, is it served by a high quality public transport service (as defined by the Local Plan), within a 400 metre walk of all new housing?	Significant levels of public transport services will be provided throughout the site. Exact location of collection points will be determined during detailed design of each phase.	Principle 10: Transport and mobility
SUDS	Has adequate information been provided in response to questions 1-3 of the Design Accreditation Checklist? (See Appendix B)	The Flood Risk Assessment, which can be found in the Environmental Assessment, defines existing conditions, permitted runoff rates and planning requirements. A Drainage Strategy is defined within the ES to restrict the rate and volume of runoff to Greenfield rates	Principle 8: Global, local, and internal environments. Appendix 1: Climate Change Adaptation

Theme	Checklist	Comment	Location within statement
		and to improve water quality through the use of a cascading SUDS system that incorporates source and site control features.	
	Has sufficient technical information from the Design Information Checklist been provided? (See Appendix B)	<p>The Parameter Plans, define the development plan and land use.</p> <p>The Flood Risk Assessment, which can be found in the Environmental Assessment, defines the site topography, catchment area, hydrology of the Chapter, Flood Risk, Discharge design criteria, potential area and storage capacity of SUDS features, details of receiving watercourse and riparian rights.</p>	Principle 8: Global, local, and internal environments. Appendix 1: Climate Change Adaptation
	Have sufficient soakage tests been carried out on site?	Sufficient soakage tests have been carried out on site to determine the variation in permeability of strata across the site and thereby inform the Drainage Strategy. The results of the infiltration testing are summarised within the Geotechnical Report, which can be found in an Appendix of the Environmental Statement.	Principle 8: Global, local, and internal environments. Appendix 1: Climate Change Adaptation
	Does the proposal meet the principles set out in the Design Principles section of Section 7 of the SPD?	The Drainage Strategy defined within Section 7.1 of the Flood Risk Assessment, which forms Appendix 15.1 of the Environmental Statement, permits runoff rates and volumes to be restricted to Greenfield rates, improved water quality and provides biodiversity and amenity benefits through the provision of a cascading SUDS management system incorporating source and site control features.	Principle 8: Global, local, and internal environments. Appendix 1: Climate Change Adaptation
Energy	Has the 10% CO ₂ reduction required been established using the most appropriate benchmark(s)?	This target is not applicable. A 20% reduction in the aggregate will be targeted for non-domestic buildings.	Principle 1: Energy and CO ₂ emissions

Theme	Checklist	Comment	Location within statement
	Has all onsite energy been included, including process energy where applicable?	The benchmarks developed for the Application Site include all loads where practicable based on measured energy consumption data from similar buildings.	Principle 1: Energy and CO ₂ emissions
	Has the Energy Statement form provided been completed? (Appendix C1)?	This information is provided in full detail within the Carbon Reduction Strategy Part A.	Principle 1: Energy and CO ₂ emissions
	Has initial feasibility work into renewable options for the development been provided?	A full feasibility assessment is provided in the Carbon Reduction Strategy Part A.	Principle 1: Energy and CO ₂ emissions
Recycling and Waste Facilities	Have the size and location of recycling and waste facilities, both for storage and collection, been provided?	Full details of potential waste storage and collection facilities are provided in the Sustainable Resource and Waste Management Strategy.	Principle 4: Waste
Biodiversity	Has an appropriate survey been conducted, with sufficient detail given the nature and size of the site and the proposed development?	A full ecological appraisal has been conducted.	Principle 6: Biodiversity and Ecology.
	If a protected or priority species has been identified, has a specialist been engaged to conduct a detailed survey?	Specialist ecology experts have been consulted for a range of features.	Principle 6: Biodiversity and Ecology.
	Has all the relevant information from these surveys been provided?	This is all provided within the technical Ecology Assessment in the Environmental Statement.	Principle 6: Biodiversity and Ecology.
	Has it been demonstrated how existing habitats and species have been protected through the proposed ecological and landscape strategy?	Items of major ecological value are maintained within the proposals where possible. The Ecological Assessment within the Environmental Statement and Design, Access and Landscape Statement detail the proposals.	Principle 6: Biodiversity and Ecology.

Theme	Checklist	Comment	Location within statement
	Has it been demonstrated how any potentially adverse effects have been mitigated?	A number of mitigation measures are proposed.Further information is provided in the Ecology Assessment in the Environmental Statement.	Principle 6: Biodiversity and Ecology.
	Has it been demonstrated that existing habitats have been enhanced and new ones have been created?	The Design, Access and Landscape Statement further describes and explains the proposals.	Principle 6: Biodiversity and Ecology.
	Has it been demonstrated that adequate compensation measures have been proposed where it is agreed that damage is unavoidable?	A number of mitigation measures are proposed. Further information is provided in the Ecology Assessment in the Environmental Statement.	Principle 6: Biodiversity and Ecology.
Pollution	Has an assessment of the need for lighting been carried out and the principles of an external lighting strategy that meets the requirements of the policy been set out?	<p>The streets contained within the Proposed Development will be illuminated in accordance with Cambridgeshire County Council standards. Lighting levels will vary throughout the development and will be dependent upon the volume of vehicular and pedestrian traffic and proposed adjacent land use.</p> <p>White lighting sources will be utilised to allow a lower lighting class to be used on residential streets in order to provide potential savings in energy consumption, reductions in light pollution and increased amenity due to better colour rendering of the lighting.</p> <p>Switching devices, such as time switches, photoelectric control units or remote switching devices will be used to control the hours of operation.</p>	Principle 7: Pollution
	<i>If the answer to any of the questions 1-9 below is yes, then an Air Quality Assessment is likely to be required and further guidance should be sought from the Environmental Services Scientific Team (see section 2.7 of SPD)</i>		Principle 7: Pollution

Theme	Checklist	Comment	Location within statement
	1) Does the development provide more than 50 new parking spaces or more than 25 if it is within an existing AQMA?	The South Cambridgeshire District Council Air Quality Management Area (AQMA) extends over the northwest corner of the site and there could potentially be more than 25 spaces within this existing AQMA.	Principle 7: Pollution
	2) Is the development within an AQMA and a sensitive development (Residential, school, healthcare, childcare etc.)?	No sensitive development is proposed within the AQMA area at the NW corner of the Application Site.	Principle 7: Pollution
	3) Is the development a prescribed industrial process under the PPC regulations?	A single combustion installation of more than 20 MW would require a Part B Environmental Permit from the Local Authority. If the installation is larger than 50 MW this would require a Part A1 permit from the Environment Agency. The combined rating of the six separate combustion units is in the order of 35 MW; therefore an opinion should be sought on whether this would be classified as a prescribed industrial process.	Principle 7: Pollution
	4) Is the development a sensitive development close to an existing prescribed Process?	No	Principle 7: Pollution
	5) Will the development significantly alter flows or speeds on busy roads greater than 10,000 vehicles per day or any road within an AQMA? Where 'significantly' is defined as including any of the following: <ul style="list-style-type: none">Change in traffic volume of 2% AADT or 1% AADT within the AQMAChange in average vehicle speed of 5kph or a significant increase in congestionA change in the modal split to a greater percentage of Heavy Duty Vehicles(HDVs) including buses	The transport assessment is under development.	Principle 7: Pollution
	6) Is the development part of a major phased redevelopment?	No	Principle 7: Pollution

Theme	Checklist	Comment	Location within statement
	7) May the development create a street canyon or reduce dispersion of pollutants?	No	Principle 7: Pollution
	8) Will the development significantly alter the road or rail network?	The Proposed Development will provide for new access points, a new cycle lane and new pedestrian crossings located on Huntingdon Road and Madingley Road. There will be no major alterations to the road network and no alterations to the rail network.	Principle 7: Pollution
	9) Will the proposals interfere with the Air Quality actions stated in the Local Transport Plan or Local Air Quality Action Plan?	The proposals should not affect the Air Quality actions.	Principle 7: Pollution
	Is there a previous potentially contaminative use?	The site is generally undeveloped agricultural farmland and there are several buildings present, including an Animal Research Station, Agronomy Centre and World Conservation Monitoring Centre. These uses are unlikely to have generated contaminants; however ground investigation works and a desk based risk assessment have been prepared and are contained within the Geoenvironmental Report that forms Appendix 16.1 to the Environmental Statement.	Principle 7: Pollution
	If yes, has a desk top study been undertaken and included with the application?	Yes, a desktop study has been undertaken and confirms the above analysis.	Principle 7: Pollution
	Has the potential impact of noise from the development or noise from adjoining sites which might affect the development been assessed?	Chapter 13 of the Environmental Assessment has been prepared to assess the impact of potential noise will have on the Proposed Development and adjoining sites and mitigation measures have been identified.	Principle 7: Pollution

Theme	Checklist	Comment	Location within statement
	Has the impact of construction noise been assessed and mitigation proposed?	The Environmental Statement includes consideration of noise generated by construction activities and identifies mitigation measures.	Principle 7: Pollution
Climate Change	How have the layout, orientation and any landscaping proposals for the development taken into account predicted climate change impacts?	These will be taken into account fully at detailed design, but a number of measures including orientation and green infrastructure with low irrigation requirements are considered.	Appendix 1: Climate Change Adaptation
	What other measures have been incorporated into the development to enable it to adapt to cope with predicted climate change impacts, without increasing use of energy consuming ventilation and cooling?	All domestic buildings will be designed to be naturally ventilated where practicable and modelling will consider future peak summer temperatures to reduce the risk of overheating. This will help prevent the need for domestic air conditioning in the future. Non domestic buildings will be narrow plan and naturally ventilated where possible.	Appendix 1: Climate Change Adaptation
Water	Has a target been set for the reduction of water consumption for the development?	Code level 5 (80 litres per person per day) is targeted for homes. Reduction levels in non-domestic buildings will vary depending on the building type, but will meet BREEAM requirements by using low water consumption devices, combined with rainwater and / or greywater recycling.	Principle 2: Water
Materials and Construction Waste	Has a target been set for improving the environmental impact of materials used in constructing the development?	Specific targets will depend on the exact nature of the buildings proposed at detailed design. Indicative targets are proposed in the Sustainable Waste and Resource Management Plan and the Outline Site Waste Management Plan.	Principle 4: Waste Principle 5: Materials and Construction