

# Sustainability and Energy Statement

## Hanwell Fields, Banbury

September 2021



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**Client**

Manor Oak Homes Ltd.

**Turley Reference**

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# 1. Introduction

## This Sustainability and Energy Statement has been prepared to demonstrate the sustainability credentials of the development proposals at Hanwell Fields, Banbury.

This Sustainability and Energy Statement has been prepared by Turley Sustainability, on behalf of Manor Oak Homes Ltd (MOH), to support the outline planning application for the development at Hanwell Fields, Banbury.

It provides details of the sustainable design measures incorporated to ensure a high standard of sustainability performance in accordance with local and national planning policy.

### Site Context

The site is an agricultural field located in Hanwell Fields, Banbury. It is bounded to the South by Dukes Meadow Drive and Hanwell Fields Park, to the East by Hanwell Local Centre and residential area and by the North and West by agricultural land. Hanwell Fields to the north of Banbury, approximately 2.9km from Banbury town centre.

Hanwell Fields has a number of community facilities including a primary school, community centre, a play area, convenience store and pub all within walking distance of the proposed development. There are also several areas of public open spaces throughout Banbury, including Hanwell Fields Park to the south of the site, where a Public Right of Way (PRoW) will connect the development to the park. Banbury railway station is 3.4km from the development.

### Proposed Development

The description of development is as follows;

*“Residential development of up to 78 dwellings with all matters reserved other than access”*

The following chapters set out the local and national sustainability objectives, followed by a review of the measures incorporated into the design of the development and those to be considered during the detailed design, in order to demonstrate the social, economic and environmental benefits of the development.

Please note, the terms “carbon”, carbon dioxide (CO<sub>2</sub>)” and “greenhouse gas (GHG)” are used interchangeably in this Strategy depending on the terminology of referenced documents.

Figure 1: Parameters Plan



## 2. Policy Context

This chapter provides an overview of the relevant sustainability planning policy and guidance from a national and local perspective.

### National Policy

This section sets out a summary of current national guidance and policy in relation to sustainable development.

#### National Planning Policy Framework

Most recently updated in June 2019 the National Planning Policy Framework (NPPF) provides a framework for the development of locally-prepared plans and the government's planning policies for England and how these are expected to be applied.

Paragraph 7 of the NPPF states that: 'the purpose of the planning system is to contribute to the achievement of sustainable development'.

It states clearly that in order to deliver sustainable development, the planning system must perform three distinct objectives, aligned to the three pillars of sustainability, which must not be taken in isolation and should be pursued jointly:



An **economic** objective to contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth, innovation and improved productivity; and by

identifying and coordinating the provision of infrastructure.



A **social** objective supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and



An **environmental** objective contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

These objectives are key to the development of plans and the NPPF sets out a number of key themes for consideration which guide the preparation of local plans and policies, ensuring the delivery of sustainable development.

#### Planning Practice Guidance

Planning Practice Guidance (PPG) provides further advice on various planning issues associated with development, including those linked to sustainability and renewable energy and underpins the policies within the NPPF.

PPG is a material consideration in planning decisions and should generally be followed unless there are clear reasons not to. It sets out how local authorities should include policies that protect the

local environment and strategies to mitigate and adapt to climate change and supports developments that are functional and adaptable for the future.

The March 2019 PPG update confirms that Local Authorities have the option to set technical requirements exceeding the minimum requirements of the Building Regulations in respect of access, water and space where sufficient evidence is produced to justify the target.

### National Design Guide

The National Design Guide published in October 2019 and is based on the national planning policy practice guidance and objective for good design as set out in the NPPF. The Guide introduces ten characteristics of well-designed places which work together to create developments of character and community, while positively addressing environmental issues affecting climate.

### Building Regulations

Whilst not planning policy, in April 2014 the Part L regulations changed and it is now a requirement of the current 2013 Regulations for new homes to deliver a 6% reduction in carbon emissions compared to 2010 Part L. This change aimed to strike a balance between the commitments to reduce carbon emissions and improving energy efficiency and ensure that the overall effect of regulation upon consumers and businesses does not stifle growth.

The October 2019 Future Homes Standard (FHS) consultation concluded in a 2021 uplift of 31% CO<sub>2</sub> reduction compared to 2013 Building Regulations standards. This is an interim target ahead of the 2025 implementation of the FHS which will require all new homes to reduce CO<sub>2</sub> emissions by at least 75% lower than current standards. The Government is aiming for Part L and Part F updates to be regulated for in late 2021 (subject to the Part 2 consultation) and implemented from 2022. All homes should be 'zero carbon ready'; adaptable and fit for the future.

Local Authority retain powers to set local energy efficiency standards for new homes.

## Local Policy

### 2.2.1 Cherwell Council Climate Emergency

The council declared a Climate Emergency in July 2019, committing it to ensure its own operations and activities are zero carbon by 2030. The declaration also laid out the goal - with the support of residents, businesses and other organisations - of achieving net zero for the wider district by 2030.

A Climate Action Framework was published in 2020 which includes details on how Cherwell intend to achieve these goals. The framework is primarily focussed on the Council's operations although the below points relate to new residential development;

- Support policies that enable zero carbon developments within the Oxfordshire Plan 2050 and the Oxfordshire Local Connectivity and Transport Plan 5.
- New housing to meet the highest energy standards.
- Focussing on building future resilience: Supporting a local zero- carbon energy system that moves away from reliance on global fossil fuels and Enhancing digital connectivity.

### 2.2.2 The Adopted Cherwell Local Plan 2011-2031 (Part 1)

The adopted local plan contains strategic planning policies for development and the use of land. It forms part of the statutory Development Plan for Cherwell to which regard must be given in the determination of planning applications. The Plan was formally adopted by the Council on 20 July 2015. Policies related to the sustainability of the proposed development are set out below;

**Policy BSC 4: Housing Mix:** New residential development will be expected to provide a mix of homes to meet current and expected future requirements in the interests of meeting housing need and creating socially mixed and inclusive communities.

**Policy ESD 1: Mitigating and Adapting to Climate Change:** Measures will be taken to mitigate the

impact of development within the District on climate change. At a strategic level, this will include:

- Distributing growth to the most sustainable locations as defined in this Local Plan.
- Delivering development that seeks to reduce the need to travel and which encourages sustainable travel options including walking, cycling and public transport to reduce dependence on private cars.
- Designing developments to reduce carbon emissions and use resources more efficiently, including water (see Policy ESD 3 Sustainable Construction).
- Promoting the use of decentralised and renewable or low carbon energy where appropriate (see Policies ESD4 Decentralised Energy Systems and ESD 5 Renewable Energy).

The incorporation of suitable adaptation measures in new development to ensure that development is more resilient to climate change impacts will include consideration of the following:

- Taking into account the known physical and environmental constraints when identifying locations for development.
- Demonstration of design approaches that are resilient to climate change impacts including the use of passive solar design for heating and cooling.
- Minimising the risk of flooding and making use of sustainable drainage methods, and Reducing the effects of development on the microclimate (through the provision of green infrastructure including open space and water, planting, and green roofs).
- Adaptation through design approaches will be considered in more locally specific detail in the Sustainable Buildings in Cherwell Supplementary Planning Document (SPD).

**Policy ESD 2: Energy Hierarchy and Allowable Solutions:** In seeking to achieve carbon emissions

reductions, we will promote an 'energy hierarchy' as follows:

- Reducing energy use, in particular by the use of sustainable design and construction measures.
- Supplying energy efficiently and giving priority to decentralised energy supply
- Making use of renewable energy.
- Making use of allowable solutions.

**Policy ESD 3: Sustainable Construction:** All new residential development will be expected to incorporate sustainable design and construction technology to achieve zero carbon development through a combination of fabric energy efficiency, carbon compliance and allowable solutions in line with Government policy.

- Cherwell District is in an area of water stress and as such the Council will seek a higher level of water efficiency than required in the Building Regulations, with developments achieving a limit of 110 litres/person/day.
- All development proposals will be encouraged to reflect high quality design and high environmental standards, demonstrating sustainable construction methods including but not limited to:
  - Minimising both energy demands and energy loss;
  - Maximising passive solar lighting and natural ventilation;
  - Maximising resource efficiency  
Incorporating the use of recycled and energy efficient materials  
Incorporating the use of locally sourced building materials;
  - Reducing waste and pollution and making adequate provision for the recycling of waste;
  - Making use of sustainable drainage methods;



- Reducing the impact on the external environment and maximising opportunities for cooling and shading (by the provision of open space and water, planting, and green roofs, for example); and
- Making use of the embodied energy within buildings wherever possible and re-using materials where proposals involve demolition or redevelopment.

**Policy ESD 4: Decentralised Energy Systems:** The use of decentralised energy systems, providing either heating District Heating (DH) or heating and power (Combined Heat and Power(CHP))will be encouraged in all new developments.

A feasibility assessment for DH/CHP, including consideration of biomassfuelled CHP, will be required for:

- All residential developments for 100 dwellings or more; and
- All residential developments in off-gas areas for 50 dwellings or more.

**Policy ESD 5: Renewable Energy:** A feasibility assessment of the potential for significant on site renewable energy provision (above any provision required to meet national building standards) will be required for:

- All residential developments for 100 dwellings or more; and
- All residential developments in off-gas areas for 50 dwellings or more.

**Policy ESD 6: Sustainable Flood Risk Management**

Site specific flood risk assessments will be required to accompany development proposals in the following situations:

- All development proposals located in flood zones 2 or 3;
- Development proposals of 1 hectare or more located in flood zone 1;

- Development sites located in an area known to have experienced flooding problems; and
- Development sites located within 9m of any watercourses

**Policy ESD 7: Sustainable Drainage Systems**

**(SuDS):** All development will be required to use sustainable drainage systems (SuDS) for the management of surface water run-off.

Where site specific Flood Risk Assessments are required in association with development proposals, they should be used to determine how SuDS can be used on particular sites and to design appropriate systems.

In considering SuDS solutions, the need to protect ground water quality must be taken into account,especially where infiltration techniques are proposed.

Where possible, SuDS should seek to reduce flood risk, reduce pollution and provide landscape and wildlife benefits.

**Policy ESD 8: Water Resources:** The Council will seek to maintain water quality, ensure adequate waterresources and promote sustainability in water use.

**Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment:**

Protection and enhancement of biodiversity and the natural environmentwillbe achieved by considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources.

**Policy ESD 13: Local Landscape Protection and Enhancement:**

Opportunities will be sought to secure the enhancement of the character and appearance of the landscape, particularly in urban fringe locations, through the restoration, management or enhancement of existing landscapes,features or habitats and where appropriate the creation of new ones, including the planting of woodlands, trees and hedgerows.

### **Policy ESD 15: The Character of the Built and**

**Historic Environment:** New development will be expected to complement and enhance the character of its context through sensitive siting, layout and high quality design. All new development will be required to meet high design standards.

**Policy ESD 17: Green Infrastructure:** The District's green infrastructure network will be maintained and enhanced through the following measures:

- Pursuing opportunities for joint working to maintain and improve the green infrastructure network, whilst protecting sites of importance for nature conservation
- Protecting and enhancing existing sites and features forming part of the green infrastructure network and improving sustainable connectivity between sites in accordance with policies on supporting a modal shift in transport

### **Policy SLE 4: Improved Transport and Connection:**

All development where reasonable to do so, should facilitate the use of sustainable modes of transport to make the fullest possible use of public transport, walking and cycling. Encouragement will be given to solutions which support reductions in greenhouse gas emissions and reduce congestion.

### **Policy Banbury 5: North of Hanwell Fields**

**Development Area:** Development Description:

Located at the northern edge of Banbury, this residential-led strategic development site will provide approximately 544 dwellings with associated facilities and infrastructure in a scheme that demonstrates a sensitive response to this urban fringe location. Affordable Housing - 30% Key site specific design and place shaping principles Proposals should comply with Policy ESD15 include;

- Layout of development that enables a high degree of integration and connectivity with the Hanwell Fields development to the south.
- A high quality residential District for the north of Banbury that is designed with consideration

to the landscape setting and well integrated with the adjacent residential area.

- Development should actively address Dukes Meadow Drive, providing active frontage and surveillance onto this route.
- A layout that maximises the potential for walkable neighbourhoods and enables a high degree of integration and connectivity between new and existing communities.
- New footpaths and cycleways should be provided that link with existing networks, the wider urban area and community facilities with a legible hierarchy of routes to encourage sustainable modes of travel.
- Good accessibility to public transport services should be provided for with effective footpaths and cycle routes to bus stops including the provision of a bus route through the site and new bus stops on the site.

### **2.2.3 Cherwell Local Plan 2040**

A new Local Plan for Cherwell is under development, the plan will be called the Cherwell Local Plan 2040. Once the Plan has been adopted, it will replace the adopted Cherwell Local Plan 2015 and 'saved' policies in the Cherwell Local Plan (1996).

A Community Involvement Paper Consultation was completed between 31 July 2020 and 14 September 2020. The Local Plan Review is at a very early stage of development.

### **2.2.4 Cherwell Residential Design Guide Supplementary Planning Document**

The Cherwell Residential Design Guide provides masterplanning and architectural design guidance to applicants and was adopted on 16 July 2018. It also provides further guidance on how to achieve the sustainability policies present in the adopted local plan. Key points include:

- **Sustainable Technologies:** In all developments, opportunities to incorporate sustainable technologies and raise levels of

energy efficiency should be taken wherever this can be successfully achieved without detriment to the urban form and placemaking objectives of the vision. Where the vision is for a sustainable exemplar with high levels of energy efficiency, it is recognised that this will have an influence on the urban form of the masterplan and the design of individual buildings.

- **Sustainable Travel: Electric charging points:** Every home should have access to at least one electric charging point. **Car clubs:** The Council supports car clubs particular in low car developments. Car club vehicles are generally made available to residents on a pay as you go basis and are particularly suited to central and higher density areas where car use is only necessary for occasional trips. Discussion with the Council is required to resolve practical issues relating to implementation.

New development in Cherwell should:

- Consider sustainability objectives at the masterplan, plot and building scale
- Incorporate innovation in a manner which reinforces the principles of good urban design
- Create robust places which can adapt to future changes in the way we live and use technology
- Create healthy buildings which provide a safe and comfortable environment for their inhabitants

## 2.3 Planning Policy Summary

Both local and national policy aims to ensure the delivery of sustainable and well-designed homes and which mitigate and adapt to the increasingly urgent impacts of climate change.

The Cherwell Local Plan demonstrates the Borough's commitment to the creation of sustainable new developments in the Borough, bolstered by the Climate Emergency declaration and the Climate Action Framework 2020.

Latest national planning policy and guidance confirms the Government's approach to sustainable development is being driven through the updates to the Building Regulations through the Future Homes Standard to ensure that new homes are well designed and reduce emissions in line with the UK's national carbon targets.

The adopted Local Plan and Design Guide SPD requires development to consider a range of sustainable design measures, including sustainable construction and resource management, green infrastructure, SuDS, energy efficient and low carbon buildings, water efficiency, access for all and enhancing biodiversity; and health and wellbeing of a community. It is noted that the Local Plan includes a need to align with Government policy which has evolved since the plan was adopted in 2015.

The following sections of this Sustainability and Energy Statement set out the measures incorporated into the design of the development to ensure the delivery of a sustainable development and address the requirements of local and national policy.

# 3. Sustainability at Hanwell Fields, Banbury

## This section sets out the sustainability and energy strategy for the Proposed Development at Hanwell Fields, Banbury.

This section of the report sets out the sustainability and energy strategy for the Proposed Development at the Hanwell Fields, demonstrating how the development responds to local sustainability planning policy.

Manor Oak Homes Ltd are committed to the delivery of a sustainable new development. To ensure the sustainability strategy reflects the current ambition of Cherwell's sustainability approach in light of the Climate Emergency declaration, Manor Oak Homes have focused their sustainability strategy on the targets present in the local plan and achievement of the Interim Future Homes Standard, which is a 31% improvement beyond current Building Regulations. Meeting the FHS interim target through an all-electric strategy will allow home owners to operate Net Zero through the purchase of renewable electricity.

The sustainable design measures incorporated into the development masterplan at the outline application stage are set out under headings which reflect the key Cherwell Local Plan policies listed below;

- Mitigating and Adapting to Climate Change (Policy ESD 1, 6 and 7)
- Sustainable Construction and Energy Strategy (Policy ESD 2,3, 4 and 5)
- Resource Efficiency and Materials (Policy ESD 3)
- Environment Protection and Enhancement (Policy ESD 3)

- Waste Management (Policy ESD 3)

### 3.1 Mitigating and Adapting to Climate Change

One of the main challenges facing the UK and new development is the need to mitigate and adapt to a changing climate. The Government is committed to tackling climate change and in 2019 set out an ambition to extend the UK Carbon reduction target to reduce carbon emissions by 100% by 2050, relative to the levels in 1990s.

Climate change will cause the UK to become warmer, winters will become wetter, and summers will become drier. Adapting to this changing climate will impact on the design, construction, location, cost and operation of all new buildings in the next few decades. One of the NPPF's core planning principles is for development to consider climate change adaptation and mitigation during the planning process.

The Council's adopted Local Plan and Climate Action Framework support the Government's objectives for sustainable development reducing energy use and carbon dioxide emissions, adapting to and mitigating the effects of climate change. Adopted **Policy ESD 1: Mitigating and Adapting to Climate Change** provides guidance on measures to be taken to mitigate the impact of development within the District on climate change. These measures include;

- Taking into account the known physical and environmental constraints when identifying locations for development;
- Delivering development that seeks to reduce the need to travel and which encourages sustainable travel options including walking, cycling and public transport to reduce dependence on private cars;

- Demonstration of design approaches that are resilient to climate change impacts including the use of passive solar design for heating and cooling and;
- Minimising the risk of flooding and making use of sustainable drainage methods, and Reducing the effects of development on the microclimate.

The ways in which the development has been designed to respond to locational constraints, as set out in the first bullet point, is detailed in **Section 3.1.1** of this report. The ways in which the design reduces the need to travel and includes sustainable transport options is set out in **Section 3.1.1**. The ways in which the design supports resilience to climate change impacts including the use of passive solar design for heating and cooling is set out in **Section 3.1.2**. The ways in which the development will minimise the risk of flooding is set out in **Section 3.1.2**.

### 3.1.1 Physical and Environmental Constraints

As stated in policy ESD 1 the proposed development has taken into account the known physical and environmental constraints when identifying locations for development.

#### Sloping Gradient

The key physical constraint is that the site is sloping and falls from around 133m on its western edge to around 105m above ordinance datum (AOD) on its eastern side near the roundabout. The existing gradient is on average around 1:10.

The existing gradient of the site requires a careful design approach to minimise large retaining structures, visually soften the roofscape of the dwellings as they rise up the hill and to achieve a road gradient of around 1:15.

The design response to this constraint is to leave the highest parts of the site to the western edge (and above the 129m) contour as open space to create a green buffer to the development and

minimise the height of structures on the raising ground.

Full details on how the development has responded to site constraints and opportunities is set out in the Design and Access Statement by Thrive Architects<sup>1</sup>.

#### Sustainable Location for development

The site is located on the northern settlement edge of Banbury, adjacent to the recently established “Hanwell Fields” residential area built out along the Dukes Meadow Drive corridor. The site is sustainably placed to access by foot and cycle the wide range of facilities in the existing Hanwell Fields residential area.

Immediately adjacent to the south east of the site and across Dukes Meadow Drive is the Hanwell Local Centre which comprises a range of small retail shops a Co-Op neighbourhood food store and the Hanwell Arms pub and Hanwell Community Centre.

The sustainable location of the development will be further enhanced through the transport strategy. The development will be designed to encourage pedestrians and cyclists, through provision of the following:

- Creation of a 2 new links into Hanwell Fields Park to access the recreational area and the PRow network.
- Cycle parking will be provided at a level of at least one space per one bed dwellings and at least two spaces per dwelling of two or more bedrooms.
- Within the site the 5.5m wide development road will be bound by two 2m wide footways.
- To promote sustainable travel each household will be provided with a Travel Welcome Pack. The pack will contain a high-quality map of the area, showing cycle, walking and public

<sup>1</sup> Design and Access Statement, Thrive, September 2021

transport routes, and up-to-date timetables for local bus and connecting train services.

The travel plan has been developed in line with emerging policy SLE 4 'Improved Transport and Connections'. The key features of the plan are set out below;

- **Electric Vehicle Charging** – The development will include provision for electric vehicle charging, details of which will be agreed with the Local Planning Authority (LPA).
- **Cycle Parking** - Secure cycle parking facilities will be provided across the development with least one space per one bed dwellings and at least two spaces per dwelling of two or more bedrooms.

Full details of the sustainable transport measures provided are located in the Transport Statement and Travel Plan completed by MAC<sup>2</sup>.

### 3.1.2 Mitigating and Adapting to Climate Change

In this context the following section outlines the key climate change mitigation and adaptation measures considered appropriate for this development based on the latest national guidance and policy **ESD 1**.

Developing energy efficient, low carbon buildings is a key objective of national policy and anticipated changes to the Building Regulations, supporting the reduction of energy demand through efficient building design to reduce carbon emissions.

To ensure the Proposed Development is resilient to the effects of climate change it will incorporate a number of key design measures in response to the climate predictions set out in the UKCP18 projections.

The UKCP18 projections demonstrate that over time the UK will experience increased summer and winter temperatures with significantly increased maximum temperatures, reduced summer rainfall,

increased winter rainfall and an increase in extreme weather events.

The UK Climate Change Risk Assessment identifies the key risks associated with the effects of climate change and in relation to the built environment, namely reduced summer water availability, increased winter rainfall and increased summer temperatures.

This section identifies key measures which will be incorporated into the design of new buildings and the Proposed Development to adapt to climate change. The ways in which the design supports resilience to climate change impacts including the use of passive solar design for heating and cooling are set out in the bullet points below. These measures will form a part of the detailed design for the new homes.

- Design to promote **passive solar gains**, maximise natural daylight, and sunlight;
- Homes designed to take account increasing annual temperatures set out in the UKCP18 climate projections to **minimise the risk of overheating**.
- Roof spaces across the site **orientated to accommodate Solar PV panels**.
- Incorporating **high efficiency lighting** targeting 100% of all light fittings as low energy lighting;
- Prioritisation of **natural ventilation**, contributing to good internal air quality;
- Utilisation of materials and services that have **low emission rates and pollutants**.

#### 3.1.2.1 Water Efficiency

Potable water is an increasingly important natural resource and with the majority of the UK classed as being in an area of moderate or severe water stress, the conservation of water is becoming a more significant sustainability metric.

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<sup>2</sup> Transport Statement & Travel Plan, MAC, August 2021

Adopted **Policy ESD 3: Sustainable Construction** confirms that Cherwell District is in an area of water stress and as such the Council will seek a higher level of water efficiency than required in the Building Regulations, with developments achieving a limit of 110 litres/person/day.

The new development will aim to reduce water consumption through a range of water efficiency measures such as:

- Dual flush WCs;
- Water meters;
- Low flow fittings; and
- Where appropriate, water efficient equipment.

Through the use of these measures new homes will achieve a water consumption rate of 110l/p/d, in line with the policy requirement.

These measures will help place less burden on the fresh water infrastructure and reduce water bills for residents.

### 3.1.2.2 Flood Risk and Drainage

Adopted policies **ESD 6: Sustainable Flood Risk Management and ESD 7: Sustainable Drainage Systems** confirm the importance of new developments utilising SuDs for management of surface water and SuDS should seek to reduce flood risk, reduce pollution and provide landscape and wildlife benefits.

A Flood Risk Assessment (FRA) & Drainage Strategy has been prepared by MAC<sup>3</sup>, which indicates that the site is located entirely within in Flood Zone 1 for fluvial flooding in addition to largely a very low risk of surface water flooding.

The surface water discharge rate from the site will be restricted to greenfield equivalent run-off rates to ensure that the rate of surface water run-off from the site does not increase as a result of the proposed development. Surface water run off will be managed on site by a series of attenuation

features and swales feeding to an attenuation basin located on the lowest part of the site to the east and in the adjacent field.

The proposed drainage strategy will comprise a:

- A piped network;
- Hydrobrake flow control;
- Detention Basin for the storage of Runoff; and
- Permeable paving to private drives which will act as a treatment stage for any contaminated runoff and will also provide attenuation.

The detention basin will be in the form of a habitat pond which will provide landscape and wildlife benefits in line with policy ESD 7.

Through these measures the drainage system will be capable of attenuating the 1 in 100 year storm event plus a 40% allowance for climate change.

Further information on the sites flood risk and the proposed surface water management system can be viewed in the accompanying FRA and Sustainable Drainage Strategy.

### 3.1.2.3 Managing Heat Risk

With increasing summer temperatures there is an increasing risk of overheating in buildings which could adversely affect building occupants and users.

The development will incorporate passive solar design measures. The proposed windows will aim to maximise daylight. The glazing specification will be selected to provide a balance of solar control and access to passive solar gain.

The homes are orientated to make best use of passive solar gains and will as required undergo overheating assessments in accordance with the updated building regulations or thermal dynamic modelling to minimise the potential risk of overheating as a result of increasing annual temperatures.

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<sup>3</sup> Flood Risk Assessment, MAC, September 2021

### 3.1.3 Recommendations

The following recommendations for the development at reserved matters stage relating to mitigating and adapting to climate change are set out below;

Mitigating and Adapting to Climate Change: Recommendations.	
Design to incorporate climate resilience measures as set out in section 3.1.2 <b>(Policy Target ESD1)</b>	✓
New homes will achieve a water consumption rate of 110l/p/d <b>(Policy Target ESD3)</b>	✓
Drainage system will be capable of attenuating the 1 in 100 year storm event plus a 40% allowance for climate change <b>(Policy Target ESD6&amp;7)</b>	✓
Provide sustainable transport measures in line with transport strategy and travel plan. <b>(Policy Target ESD1)</b>	✓
Completion of overheating assessments to minimise risk of overheating <b>(Policy Target ESD1)</b>	✓

### 3.2 Sustainable Construction and Energy Strategy

Adopted Policy **ESD3 Sustainable Construction** confirms that all new residential development will be expected to incorporate sustainable design and construction technology to achieve net zero carbon development through a combination of fabric energy efficiency, carbon compliance and allowable solutions in line with government policy.

Policy ESD3 confirms that all development proposals will be encouraged to reflect high quality design and high environmental standards, demonstrating sustainable construction methods including but not limited to:

- Minimising both energy demands and energy loss; **(Covered in Section 3.2.1)**

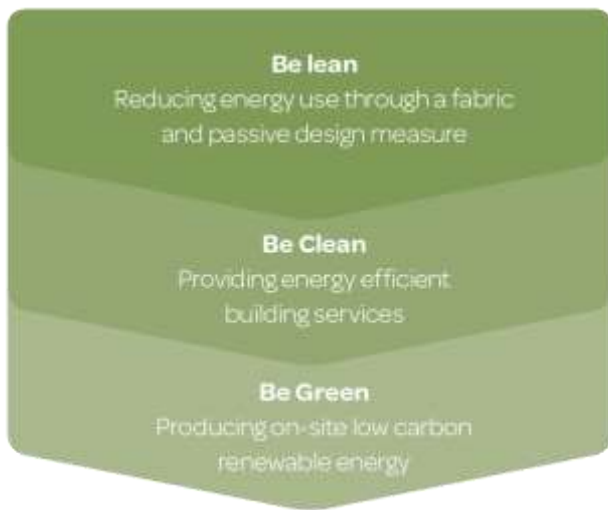
- Maximising passive solar lighting and natural ventilation; **(Covered in Section 3.2.1)**
- Maximising resource efficiency  
Incorporating the use of recycled and energy efficient materials and use of locally sourced building materials; **(Covered in Section 3.3)**
- Reducing waste and pollution and making adequate provision for the recycling of waste; **(Covered in Section 3.5)**
- Making use of sustainable drainage methods; **(Covered in Section 3.1.2)**
- Reducing the impact on the external environment and maximising opportunities for cooling and shading (by the provision of open space and water, planting, and green roofs, for example); **(Covered in Section 3.4)**
- Making use of the embodied energy within buildings wherever possible and re-using materials where proposals involve demolition or redevelopment. **(Covered in Section 3.3)**

The new homes will be designed to meet the FHS interim target through an all-electric strategy which will allow home owners to operate Net Zero. This reflects the Council’s policy which includes a need to align with Government policy which has evolved since the plan was adopted. Further detail of the ways in which the proposed development will achieve the carbon reduction target are set out in section 3.2.4 below.

The proposed dwellings have been designed in accordance with the energy hierarchy, as shown in **Figure 2**, which aims to reduce energy demand through passive design measures and a fabric first approach before utilising low carbon energy and the production of on-site renewable energy.



Figure 2: The Energy Hierarchy



Through meeting the interim FHS the new dwellings will achieve a 31% carbon reduction, beyond Current Building Regulations.

The following sections set out the measures included to deliver an energy efficient, low carbon development in line with the energy hierarchy and local planning policy.

### 3.2.1. Be Lean – Reducing Energy Use

Central to the delivery of low carbon and energy efficient buildings is the 'Fabric First' principle which recognises the most effective way of minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This 'fabric first' approach has a number of distinct benefits including:

- Carbon savings delivered are 'locked-in' for the lifetime of the building (60 years or more);
- Virtually no maintenance and/or replacement costs to maintain carbon reductions through improved fabric;

- No reliance on an occupier's behaviour to deliver carbon reductions.

**Energy Efficiency Measures** – The design of the new homes will reduce thermal energy demand by the achievement of improved insulation levels and air leakage and fabric u-values in line with the interim FHS.

The following measures to reduce energy use and carbon emissions will be considered during the detailed design of individual buildings:

- Design to promote passive solar gains, maximise natural daylight, sunlight and ventilation;
- Design which aims to optimise natural daylight;
- Buildings which target better u-values and air tightness than current Building Regulations;
- An All-Electric heating strategy;
- Incorporating high efficiency lighting targeting 100% of all light fittings as low energy lighting;
- Specification of high energy efficient equipment that will use less energy and water.

### 3.2.2. Be Clean – Efficient Energy

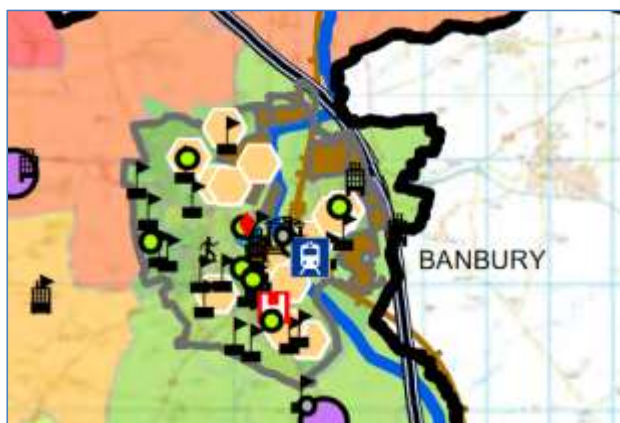
The next stage of the Energy Hierarchy is the efficient supply of heat and energy. This means connecting into an existing district heating network (DNH) where possible or providing an on site communal heat network or individual systems.

Policy **ESD4 Decentralised energy systems** states that decentralised energy systems are encouraged for new development. A feasibility assessment is required for residential development for 100 dwellings or more. Although the proposed development is below the 100 dwelling threshold, a review has been undertaken to determine the feasibility of a DH system.

The inclusion of a decentralised heating system has been investigated in terms of its appropriateness to the proposed development as it can help to provide reductions in CO<sub>2</sub> emissions.

An investigation has been carried out to identify existing and planned district heating networks in the vicinity of the site. The Renewable Energy and Low Carbon Map at Appendix 5 'Thematic Maps' in the Local Plan shows the broad potential for decentralised heat supply in the District.

**Figure 3: Cherwell Renewable Energy Map**



The map above shows no proposed District Heating Schemes or potential Heat Source in the area. The site is largely surrounded by agricultural land and low rise residential buildings and therefore there is no anchor load for a District Heat Network to connect into.

Given the lack of existing nearby district heating or community heating infrastructure to connect to, a Decentralised Energy System is not considered feasible for the proposed development.

The continued decarbonisation of the national electricity grid alongside the revised carbon factors proposed for the interim Part L 2021 update have now made the use of communal gas boilers and CHP technology counterproductive. Alternative low carbon technologies have been considered to supply heat and the use of Air Source Heat Pumps (ASHPs) is considered the most practical, cost

effective and low risk solution for the development.

Policy **ESD 5 Renewable Energy** states that a feasibility assessment for onsite renewable energy provision will be required for residential developments over 50 dwellings in off-gas areas. As the development proposes an all-electric energy strategy MOH are going beyond the current Building Regulation requirements and future proofing the site as off gas. Therefore a feasibility assessment is not required as a part of this application.

### 3.2.3 Be Green – Low Carbon Renewable Energy

The final stage of the energy hierarchy is the generation of on-site low carbon renewable energy to provide a further reduction in carbon emissions.

A review of potential low carbon renewable energy technologies and their suitability for inclusion in the development has been completed and are provided further on in this section.

#### Heat Pumps

Heat pumps provide low carbon heat sourced either from the ground (Ground Source Heat Pumps) or air (Air Source Heat Pumps). This type of system is suited to thermally efficient buildings. They require main electricity to operate but typically generate at around three units of heat for every unit of electricity that is consumed. Because the heat generated is at a lower temperature than that produced by a gas boiler, heat pumps typically require underfloor heating or over-sized radiators to ensure the heat is distributed efficiently. The government anticipates that the decarbonisation of the electricity network will shift design to using electric heating systems, including heat pumps.

#### Ground Source Heat Pumps

Ground source heat pumps (GSHP) draw heat from underground through a refrigeration cycle, and can be a very efficient solution. The ground can also be used as a source of heat and cooling. The ground conditions are currently unknown and may not be suitable for such a system. GSHPs can be

either open loop or closed loop. An open loop system will require abstraction and discharge licences from the Environment Agency; a closed loop system comprises of buried pipes. This system requires extensive ground works to extract low grade heat from the earth, proving very expensive. GSHPs are not practical or cost-effective for this development.

#### Air Source Heat Pumps

Air source heat pumps use the same concept operation as Ground Source Heat Pumps; but use air as a heat source. ASHPs extract low grade heat from the air and raise the heat to a higher temperature for domestic heating and hot water loads.

The use of ASHPs needs to comply with the the minimum performance as set out in the Enhanced Capital Allowance (ECA) product criteria and CIBSE CP1: Heat Network: Code of Practice for the UK. The ASHP will need to be specified in accordance with:

- High seasonal heat supply efficiencies;
- High efficiency motors and variable speed pumps;
- Enhanced insulation of distribution pipework and valves;
- Appropriate controls, temperature and zone zoning; and
- Low noise emissions

#### Solar Photovoltaics (PV)

Solar photovoltaic (PV) systems generate electricity from sunlight and are well suited to dwellings with unobstructed south-east to south-west facing roof space. Excess power is exported to the grid or can be harnessed using battery storage. Maintenance requirements are typically minimal.

The masterplan has been designed to orientate the homes to the south or so the homes have south facing roof spaces that allow PV installation.

#### Solar Thermal

Solar thermal systems generate hot water from sunlight in a similar manner to Solar PV. They require insulated tanks to store the hot water and have greater maintenance demands than solar PV given the need to ensure anti-freeze in the pipework is topped up every few years. They can be a highly cost effective technology particularly where mains gas supplies are not available, however in energy efficient new homes their benefit can be limited.

#### Biomass

Biomass provides useable heat from a range of solid fuels including wood and straw. The installation of a biomass boiler, flue and associated fuel store require significant space which is not considered appropriate for the development.

#### 3.2.4 Summary and Recommendations




The Energy Strategy for the new development proposes an all electric system designed in combination with fabric enhancements to achieve a 31% carbon reduction in accordance with the FHS interim standard. The review of low carbon renewable energy systems shows ASHPs and Solar PV are suitable to provide heating, hot water and power to new homes, and are noted within the governments FHS consultation as the most likely technologies to be used to meet the forthcoming interim carbon reduction target.

In summary, the proposed dwellings will be designed in accordance with the principles of the energy hierarchy to include measures to reduce the primary energy use and carbon emissions which will achieve compliance with the interim FHS. The final design of individual homes will be subject to further energy modelling carried out as part of the detailed design.

Homes will be designed to meet the FHS interim target through an all-electric strategy which will allow home owners to operate Net Zero. This reflects the Council's policy which includes a need

to align with Government policy which has evolved since the plan was adopted in 2015.

The following recommendations for the development at reserved matters stage relating to Sustainable Construction and Energy are set out below;

Sustainable Construction and Energy: Recommendations.	
New homes will be designed to meet the FHS interim target through an all-electric strategy ( <b>Beyond Policy Target ESD3</b> )	
Homes will be orientated to support Solar PV Installations ( <b>Beyond Policy Target ESD3</b> )	
The use of ASHP's for heating and hot water will be investigated ( <b>Policy Target ESD3</b> )	

### 3.3 Resource Efficiency and Materials

**Policy ESD 3, Sustainable Construction**, confirms the following points new developments should take into account in relation to resource efficiency and materials;

- Maximising resource efficiency  
Incorporating the use of recycled and energy efficient materials and use of locally sourced building materials;
- Making use of the embodied energy within buildings wherever possible and re-using materials where proposals involve demolition or redevelopment.

Embodied carbon is the carbon associated with both building materials and the construction and maintenance of a building throughout its whole lifecycle. The areas and processes where the embodied carbon of the construction process can be understood and reduced are as follows;

- Structural building elements, e.g. substructure, superstructure etc;
- Components, e.g. walls, floors, cladding;

- Carbon sources, e.g. transport, materials, site activities.

MOH are aware of the substantial carbon impacts of the construction process and building materials. Therefore as a part of the detailed design of the dwellings lower embodied carbon materials will be selected where possible. This includes locally sourced materials which will have lower transport emissions.

**Sustainable Materials** – The development will aim to use a range of sustainable materials and design features and will make use of;

- Sustainable timber from FSC (or equivalent) sources;
- Materials specified using the BRE Green Guide to construction;
- Materials that have a recycled content;
- Investigation into less carbon intensive construction materials such as low temperature asphalt.

**Reducing Waste** – The development will reduce wastage of materials through the following;

- Avoiding overordering to reduce offcuts;
- Identify materials that can be reused and recycled;
- A site waste management plan will be developed to support the minimisation of waste.

**Reduce Site Emissions** – The embodied carbon from the construction process and associated transport will be reduced through the following;

- Use of locally sourced materials where possible to reduce transport emissions;
- Investigation into use of renewable energy for site power.

Insulation materials containing substances known to contribute to stratospheric ozone depletion or with the potential to contribute to global warming will not be used.

### 3.3.1 Recommendations

The following recommendations for the development at reserved matters stage relating to Sustainable Construction and Energy are set out below;

Resource Efficiency: Recommendations.	
Target the selection of lower embodied carbon materials <b>(Policy Target ESD3)</b>	✓
Reduce waste through an ambitious site waste management strategy. <b>(Policy Target ESD3)</b>	✓
Use locally sourced materials where feasible. <b>(Policy Target ESD3)</b>	✓

## 3.4 Environment Protection and Enhancement

Policy ESD 3 confirms that new developments are to reduce the impact on the external environment and maximising opportunities for cooling and shading (by the provision of open space and water, planting, and green roofs, for example);

The Proposed Development will incorporate measures to support and enhance the environment through consideration of the existing site ecology, including measures to maximise opportunities for cooling and shading, enhance site biodiversity, as well as incorporate measures to reduce pollution from the development.

### 3.4.1 Measures to support and enhance the environment

#### Mitigation Measures

To reduce the impact on the external environment and species, a range of mitigation measures have been proposed and recommended. They can be summarised as follows:

- All hedgerows and trees to be retained within the proposed development shall be protected during construction in line with standard arboricultural best practice;

- Sensitive lighting to support potential bat populations;
- Badger and hedgehog safeguards in the construction period.

#### Enhancement Measures

To enhance the site habitats and species, a range of enhancement measures have been proposed and recommended as part of the Ecological Appraisal, and are displayed within the Landscape Masterplan. Through implementation of ecological enhancements the opportunity exists for the proposals to deliver a number of biodiversity net gains at the site.

They can be summarised as follows:

- New hedgerow and shrub planting;
- Wildflower and ornamental grass mix in the boundary areas;
- Inclusion of wetland areas; and
- Provision of bat and bird boxes.

The integration of these mitigation and enhancement measures will mean the development is capable of achieving a net gain in biodiversity in line with Policy ESD10. These measures will support Policy ESD 3 through the provision of open space and increased planting. New tree planting and inclusion of wetland areas will increase opportunities for cooling and shading.

Green Spaces provide a number of health benefits to occupiers. The World Health Organisation (WHO) reported that 'urban green spaces, such as parks, playgrounds, and residential greenery, can promote mental and physical health by providing psychological relaxation and stress alleviation, stimulating social cohesion, supporting physical

activity, and reducing exposure to air pollutants, noise and excessive heat<sup>4</sup>.

More information is available in the accompanying Ecological Appraisal by Aspect Ecology<sup>5</sup>.

### 3.4.2 Pollution

The Proposed Development will aim to minimise any negative impacts on the natural environment considering the impacts of water use, materials, and air quality in line with **Adopted Policy ESD 3** which confirms the importance of reducing waste and pollution and making adequate provision for the recycling of waste;

Some of the measures are listed below;

- Maintaining and improving air quality by ensuring skips and trucks loaded with construction materials are covered and continually damped down with low levels of water;
- Segregate, tightly cover and monitor toxic substances to prevent spills and possible site contamination;
- Use non-toxic paints, solvents and other hazardous materials wherever possible;
- The construction works will be carried out in such a manner as to avoid adverse effects on nearby surface water drainage to prevent pollution;
- Directional lighting / lighting regime during construction, with no unnecessary task lighting left on overnight;
- Construction Environmental Management Plan (CEMP) to manage noise and light pollution during construction.

- Ensuring management of contaminated land so as not to pose a risk to health and the environment.

To further enhance the development a number of additional measures will be considered during the detailed design of new homes to minimise pollution, including:

- The use of key internal finishes and fittings which comply with best practice emissions levels of Volatile Organic Compounds (VOCs) and other substances;
- Specification of low Global Warming Potential (GWP) and zero Ozone Depleting Potential (ODP) insulation materials.

### 3.4.3 Recommendations

The following recommendations for the development at reserved matters stage relating to Environmental Protection and Enhancement are set out below;

Environmental Protection and enhancement: Recommendations.	
Maximise opportunities for cooling and shading through landscape and ecology strategy ( <b>Policy Target ESD3</b> )	✓
Achieve Biodiversity Net Gain ( <b>Policy Target ESD10</b> )	✓
Minimise waste and pollution through waste strategy ( <b>Policy Target ESD3</b> )	✓

### 3.5 Waste Management

Policy ESD 3 confirms that new developments should reducing waste and pollution and make adequate provision for the recycling of waste. The following sections detail how this will be achieved at the development

<sup>4</sup> World Health Organisation (WHO) Urban green space interventions and health: A review of impacts and effectiveness. [Full report](#) (2017)

<sup>5</sup> Ecological Appraisal, Aspect Ecology, August 2021

### 3.5.1 Construction Waste Management

A Construction Environmental Management Plan (CEMP) will be developed to ensure the use of measures to minimise waste during the construction phases of the development, including a strategy for recycling/disposing of waste arising from construction works. The Construction Waste Management Plan aims to target zero avoidable waste to landfill.

All contractors will be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable.

A Site Waste Management Plan will be prepared to set out the procedures to sort, reuse and recycle construction waste. Adherence to this plan will better support and control material handling and waste; ensuring compliance with relevant waste legislation for the handling, transport and disposal of wastes; compliance with environmental management systems and management of waste-related costs. The reduction, reuse and recycling of construction waste is to be prioritised through measures such as avoidance of over-ordering, supervision of deliveries, use of secure materials storage facilities and reuse of materials onsite where feasible.

In addition the development will be registered with the Considerate Constructors Scheme and achieve certification against the Code of Considerate Practice.

The Considerate Constructors scheme is voluntary and seeks to ensure projects comply with a Code of Considerate Practice which commits those sites, companies and suppliers registered with the Scheme to care about appearance, respect the community, protect the environment, care about safety and value their workforce.



The registration and certification of the proposed development will ensure the development promotes and achieve best practice in its construction.


### 3.5.2 Operational Waste Management

The impact that a new development has on waste is mainly incurred during occupation. In accordance with the principles of the waste hierarchy, the development will be designed to reduce the quality of waste that is sent to landfill by providing residents with facilities to recycle a number of materials, removing them from the waste stream and encouraging residents to recycle.

Full consideration will be given to the Council's waste management infrastructure and services to ensure that the occupiers have the necessary infrastructure to participate in any kerbside recycling services.

### 3.5.3 Recommendations

The following recommendation for the development at reserved matters stage relating to Waste Management is set out below;

Waste Management: Recommendations.	
Target zero avoidable waste to landfill <i>(Beyond Policy Target ESD3)</i>	

# 4. Conclusion

This Sustainability and Energy Statement has been prepared to demonstrate how the Proposed Development at Hanwell Fields, Banbury responds positively to national and local sustainable policy requirements.

The Proposed Development has been designed to respond positively to national and local planning policy, and includes measures to mitigate and adapt to the effects of climate change.

This Sustainability and Energy Statement sets out a number of key sustainable design measures incorporated into the development in line with Cherwell's sustainability policies.

**Mitigating and Adapting to Climate Change** – The development will incorporate a range of measures to reduce carbon emissions, mitigating the effects of climate change, and adaptation measures to ensure the long term resilience of the development to the effects of climate change. Measures include:

- Designed to incorporate climate resilience measures including passive solar gains and natural ventilation.
- Development designed to prioritise sustainable and active modes of travel including walking and cycling;
- Specification of water efficient fittings to reduce water consumption to 110 litres per person per day.

- Development of new homes in Flood Zone 1 and provision of a surface water drainage system designed to manage a 1 in 100 annual probability plus 40% climate change rainfall event.
- Homes designed to take into account increasing annual temperatures set out in the UKCP18 climate projections to minimise the risk of overheating.

#### **Sustainable Construction and Energy Strategy** –

Through a range of design measures the development will ensure the homes will minimise carbon emissions and achieve a high standard of energy efficiency. These include:

- Buildings designed to achieve the interim FHS through the use of a fabric first approach and all electric energy strategy
- Incorporating low carbon renewable energy technologies such as ASHP, with roof spaces across the site designed to accommodate Solar PV.

#### **Resource Efficiency and Materials** –

The development will support resource efficiency and use low embodied carbon materials where possible. Measures include;

- Buildings which will be designed to make use of sustainable materials to reduce environmental impacts of construction;
- Reduce waste through an ambitious site waste management strategy.
- Use locally sourced materials where feasible.

#### **Environmental Protection and Enhancement** –

Through a range of design measures the development aims to protect and enhance the local environment, including;



- Provision of measures to protect on-site ecology and enhancement measures to increase site biodiversity which also helps reduce the impact of climate change on site habitats; and
- Provision of measures through construction and operation of the site to reduce pollution, minimise waste and encourage recycling.

**Manor Oak Homes Ltd are committed to the delivery of homes that are sustainably constructed, energy efficient and mitigate and adapt to the long term effects of climate change.**

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