



Land North of Whychurch Farm and West of Crudwell Road

Energy & Sustainability Statement

February 2025

Key Features of the Proposals

Highly energy efficient buildings, adopting a 'fabric first' approach

Air source heat pumps for heating and hot water

Renewable energy generation via photovoltaic panels

Zero carbon ready

100%
of properties with associated parking to have dedicated EV charging

Adapted to anticipated future changes in the climate

30%
reduction in potable water use against the national average

100%
of properties to have fibre-to-the-home enabled

Future Homes Standard compliant

The sustainable approach described within this Statement demonstrates that the proposals meet and indeed exceed the requirements of Policy 41 of the Wiltshire Core Strategy (2015), creating a low carbon development which is adapted to future changes in the climate.

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1 Introduction

1.1 This Statement

- 1.1.1 This *Energy & Sustainability Statement* supports the outline application for the proposed development of up to 149 dwellings on land north of Whychurch Farm and west of Crudwell Road in Wiltshire. It has been commissioned by Gleeson Land (the Applicant).
- 1.1.2 The Statement describes how the outline development proposals address the issue of sustainability, with a focus on climate change mitigation and adaptation, in line with national and local policies and regulations.
- 1.1.3 In particular, the Statement demonstrates how the proposals respond to Core Policy 41 of the *Wiltshire Core Strategy (Adopted January 2015)* and current Building Regulations, whilst looking ahead to the proposed Future Homes Standard and the *Wiltshire Local Plan Pre-Submission Draft 2020-2038 (Regulation 19)*:

Sustainable Energy Strategy

- The buildings will be 'zero-carbon ready', and very low carbon from the outset;
- High fabric standards will be specified to meet Future Homes Standard requirements for thermal efficiency as a minimum;
- There will be no natural gas connection to the proposed development;
- Energy demand will be met from low and zero carbon sources.

Reducing Carbon Emissions from Transport

- High quality broadband will be provided as required by Approved Document R;
- Accessibility to local services and sustainable transport options will encourage residents to prioritise active travel and public transport over private car use;
- Electric vehicle charging infrastructure will be incorporated in line with the requirements of Approved Document S.

Climate Resilience and Adaptation

- The development designs will anticipate future changes in the climate;
- Overheating risk will be reduced through passive design measures as required by Approved Document O;
- Open space and landscaping will provide multiple benefits;
- Surface water will be managed with the integration of SuDS.

Domestic Water Efficiency

- High water efficiency standards will be achieved through considered design.

Embodied Carbon and Waste Management

- Embodied carbon will be reduced by applying sustainable design principles, including informed material selection and the use of re-used and recycled materials during construction;
- Construction and operational waste will be managed in accordance with the principles of the Waste Hierarchy.

1.1.4 The recommendations provided are described in as much detail as is possible at this outline planning stage. Where specifics are not available, the overall approach and standards to be achieved have been set out to ensure that sustainability remains a central feature of the development as the designs develop and the application proceeds.

1.2 The Site

- 1.2.1 The proposed 12.48ha site comprises three grazing fields with hedgerow boundaries. A ditch runs along its north western edge, while a series of public rights of way dissect the site, connecting to the wider network in the town.
- 1.2.2 The site is bordered to the west by the existing residential area around Webbs Way and Snell Avenue, and to the north west by the ongoing Avon Rise development, construction of which has commenced. The B4014 Filands Road forms the site's northern boundary, beyond which are more fields. A covered reservoir and water tank and the A429 are to the east, while Whychurch Farm lies to the south.
- 1.2.3 Outline planning permission was granted for residential development on a portion of the site in October 2022 (application reference PL/2021/08453 and subsequent appeal reference APP/Y3940/W/22/3290305). The application, with all matters reserved except for means of access, included the construction of up to 71 dwellings, the creation of a new vehicular access with footways and cycle ways and ancillary road infrastructure, public open space, children's play area, allotments, landscape planting, surface water attenuation and associated infrastructure.
- 1.2.4 A reserved matters application was subsequently submitted in October 2023 to provide the detail to enable the development to be delivered (application reference PL/2023/08687) and this is awaiting determination.
- 1.2.5 This outline application for the development of up to 149 dwellings covers the wider site, encompassing both the land with outline planning consent and a further 6.44 ha of land to the south east. This will enable the provision of an increased number of dwellings as one single, coherent development.

1.3 Description of Development

- 1.3.1 The outline planning application has the following description of development:

Outline planning application (with all matters reserved except access) for residential development, including the construction of up to 149 dwellings, new vehicular access with footways and cycleways, public open space, landscape and associated infrastructure.

- 1.3.2 The image below shows the Illustrative Masterplan for the proposed development:



Figure 1: Illustrative Masterplan (Thrive Architects Ltd)

2 Sustainability Policy Review

2.1 National Planning Policy

The National Planning Policy Framework December 2024 (NPPF)

2.1.1 The NPPF Section 2 states that the purpose of the planning system is to contribute to sustainable development, and it therefore has three overarching objectives 'to be pursued in mutually supportive ways':

- An economic objective, contributing to a strong, responsive, competitive economy;
- A social objective, supporting vibrant and healthy communities and;
- An environmental objective, protecting and enhancing our natural, built and historic environment.

2.1.2 As such, the NPPF at its heart contains a 'presumption in favour of sustainable development'. Emphasising the need to achieve well designed places, the NPPF states that "*Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities*".

2.1.3 The NPPF sets out a number of principles which should underpin both plan-making and decision-taking, and of which many are particularly relevant to this document. In this context, planning should:

- Promote healthy and inclusive places that encourage social interaction, enhance healthy lifestyles, and which are safe and accessible;
- Seek to secure a high-quality of design and a good standard of amenity for occupants;
- Support the transition to a low-carbon future, avoid increased vulnerability to climate change impacts, take account of flood risk and coastal change and seek to reduce greenhouse gas emissions. Plans should include a positive strategy to help increase the use and supply of renewable and low carbon energy;
- Help conserve and enhance the natural environment, achieve net gains in biodiversity and reduce the impact of all forms of pollution;
- Plan and manage development to make full use of public transport, walking and cycling, and take into account the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles;
- Support the expansion of electronic communications networks, including next generation mobile technology (such as 5G) and full fibre broadband connections, which are seen as essential for economic growth and social wellbeing.

The Climate Change Act

- 2.1.4 The Climate Change Act 2008 is the basis for the UK's approach for tackling and responding to climate change. It commits the UK government to reducing greenhouse gas emissions by at least 100% of 1990 levels by 2050.

Building Regulations

- 2.1.5 *Approved Document L, Conservation of Fuel and Power, Volume 1: Dwellings (2021)* came into force in June 2022. It sets out the Building Regulation standards for energy performance in new developments, placing a greater emphasis on reducing primary energy use, in addition to achieving carbon and fabric efficiency targets, compared to the previous standards. The tightening of fabric energy efficiency standards, air tightness and carbon performance targets are accompanied by updated calculation and modelling requirements within the compliance mechanism (SAP10.2 for dwellings).
- 2.1.6 *Approved Document F, Ventilation, Volume 1: Dwellings* details requirements for ventilation in domestic properties to ensure that the increased air tightness (as required by the updates to Part L) does not impact on internal air quality.
- 2.1.7 These documents have been joined by the new *Approved Document O: Overheating* which has been put into place to limit overheating risk in new residential buildings. It expands on the provision in the previous Part L and requires the use of passive methods where feasible. Compliance can be demonstrated through a prescriptive or thermal simulation compliance path.
- 2.1.8 A further addition to the Building Regulations, the *Approved Document S: Infrastructure for Charging Electric Vehicles (December 2021)* details new regulations for the installation of electric vehicle charging points and cable routes. Requirement S1 from Part S of Schedule 1 and regulation 44D of the Building Regulations states that every new home with an associated parking space must have access to an EV charging point.
- 2.1.9 Water efficiency targets for new dwellings are driven by *Approved Document G: Sanitation, Hot Water Safety and Water Efficiency (2015)*. Within a domestic setting, the requirement is to limit water use to either 125 litres per person per day or, if required by the planning permission, an enhanced standard of 110 litres per person per day.

The Future Homes Standard

- 2.1.10 The Future Homes Standard (FHS), which is due to come into force in England in 2025, is part of the Government's strategy for achieving the Climate Change Act 2050 target. It will build on the current uplifts within Approved Document L and Approved Document F.
- 2.1.11 Under the proposed new Standard, an average home will have 75 – 80% fewer carbon emissions than one built to the Building Regulation 2013 requirements.

- 2.1.12 The details of the Standard are still to be confirmed, with various options having been consulted upon as part of the Future Homes and Buildings Standards Consultation which was launched in December 2023.
- 2.1.13 However, what is clear is that the Standard will require new homes to be built with high fabric standards and low carbon heating (instead of fossil fuel powered boilers which will be banned) so that they are 'zero-carbon ready'. This means that no future retrofitting will be needed to enable the properties to benefit from the ongoing decarbonisation of the Grid.
- 2.1.14 Two options for the notional building specification have been presented as part of the FHS Consultation, both of which are designed with the aim of reducing running costs and maintaining thermal comfort while balancing build costs. In both cases, the Consultation has proposed that the building fabric standards remain broadly as per those in Approved Document L (2021).

Building Element		Option 1	Option 2
U-Values (W/m ² K)	Roof	0.11	0.11
	External Wall	0.18	0.18
	Floor	0.13	0.13
	Window	1.2	1.2
	Door	1.0	1.0
Wastewater Heat Recovery		Yes	No
Heat Source		A notional air source heat pump equivalent to ErP A++	A notional air source heat pump equivalent to ErP A++
Hot Water System		Hot water storage vessel, 120mm insulation	Hot water storage vessel, 120mm insulation
Airtightness (m ³ /m ² .h@50Pa)		4	5
Ventilation		dMEV	Natural ventilation with intermittent extract fans
Renewable Energy		High efficiency solar PV panels covering equivalent of 40% of ground floor area	None

Table 1: Proposed Main Notional Building Specifications for Homes (Future Homes Standard Consultation, Dec 2023)

- 2.1.15 Other areas under consideration include improving the guidance and minimum standards for heat losses from building services, improving the real-world performance of homes and supporting the expansion of cleaner heat networks.
- 2.1.16 Two options are being considered for transitional arrangements – either a 6-month or 12-month period between the Future Homes Standard legislation being laid and it coming into force in 2025, followed by a 12-month transitional period.
- 2.1.17 The Government has also consulted on a new calculation methodology which will be used to demonstrate compliance with the FHS. Known as the Home Energy Model (HEM), this will replace the existing SAP compliance tool, and will also be used to produce Energy Performance Certificates (EPCs).

2.2 Local Planning Policy

Wiltshire Core Strategy (Adopted January 2015)

- 2.2.1 The Wiltshire Core Strategy (Adopted January 2015) sets out the Council's spatial vision, key objectives and overall principles for development in the county. It forms the main basis for assessment in planning terms and this Statement has therefore been designed to address its requirements.
- 2.2.2 Addressing climate change is one of the strategic objectives identified within the Core Strategy, highlighting it as a key consideration for Wiltshire Council.
- 2.2.3 Policy extracts from the Core Strategy which are of most relevance to this document are provided within the following table:

Core Policy	Extract
41	Sustainable Construction and Low Carbon Energy Climate change adaptation New development, building conversions, refurbishments and extensions will be encouraged to incorporate design measures to reduce energy demand. Development will be well insulated and designed to take advantage of natural light and heat from the sun and use natural air movement for ventilation, whilst maximising cooling in the summer. Sustainable construction New homes (excluding extensions and conversions) will be required to achieve at least Level 4 (in full) of the Code for Sustainable Homes*. (...) Renewable and low-carbon energy All proposals for major development will be required to submit a Sustainable Energy Strategy alongside the planning application outlining the low-carbon strategy for the proposal.
57	Ensuring High Quality Design and Place Shaping A high standard of design is required in all new developments (...) Applications for new development must be accompanied by appropriate information to demonstrate how the proposal will make a positive contribution to the character of Wiltshire through: (...) ii. the retention and enhancement of existing important landscaping and natural features, (e.g. trees, hedges, banks and watercourses), in order to take opportunities to enhance biodiversity, create wildlife and recreational corridors, effectively integrate the development into its setting and to justify and mitigate against any losses that may occur through the development; (...) v. the maximisation of opportunities for sustainable construction techniques, use of renewable energy sources and ensuring buildings and spaces are orientated to gain maximum benefit from sunlight and passive solar energy, in accordance with Core Policy 41 (Sustainable Construction and Low Carbon Energy); (...) xiv. meeting the requirements of Core Policy 61 (Transport and New Development).

61	Transport and New Development New development should be located and designed to reduce the need to travel particularly by private car, and to encourage the use of sustainable transport alternatives. As part of a required transport assessment, the following must be demonstrated: i. That consideration has been given to the needs of all transport users, where relevant, according to the following hierarchy: a. Visually impaired and other disabled people b. Pedestrians c. Cyclists d. Public transport e. Goods vehicles f. Powered two-wheelers g. Private cars (...) Where appropriate, contributions will be sought towards sustainable transport improvements, and travel plans will be required to encourage the use of sustainable transport alternatives and more sustainable freight movements.
67	Flood Risk (...) All new development will include measures to reduce the rate of rainwater run-off and improve rainwater infiltration to soil and ground (sustainable urban drainage) unless site or environmental conditions make these measures unsuitable.

* Code for Sustainable Homes was abolished in 2015 and has been largely superseded by Building Regulations standards.

Wiltshire Local Plan Pre-Submission Draft 2020-2038 (Regulation 19) September 2023

- 2.2.4 Wiltshire Council are currently preparing a new Local Plan to replace the Core Strategy described above. It will cover the period 2020-2038 and will contain a suite of new policies to guide development in the area.
- 2.2.5 The Regulation 19 Pre-Submission Draft Local Plan was submitted to the Planning Inspectorate for examination on 28 November 2024. The Wiltshire Local Development Scheme states that the Council is aiming for adoption in the third quarter of 2025.
- 2.2.6 The Regulation 19 Pre-Submission Draft Local Plan document includes a substantially updated version of Core Policy 41 (Draft Policy 85: Sustainable Construction and Low Carbon Energy) which states new build residential development should achieve a zero-carbon in operation standard, alongside a new Draft Policy 87: Embodied Carbon.

Draft Policy	Extract
85	Sustainable Construction and Low Carbon Energy <i>New residential developments</i> New build residential development will achieve a zero-carbon in operation standard, by significantly reducing heat and power demand of the building through energy efficient design and/or modern methods of construction. The remaining energy demand should then be supplied through onsite renewables. Proposed new dwellings will demonstrate the following: • space heating demand less than 30kWh/m2/annum; • total energy use less than 40kWh/m2/annum; • on site renewable energy generation to match the total energy use, with a preference for roof mounted solar PV, subject to building orientation and heritage considerations; and • connection to a district heating network where one is available. If it can be demonstrated that this would be economically unviable or technically unfeasible (for example to achieve enough onsite renewables for a block of flats), after on-site renewables have been maximised, any remaining carbon can be offset through developer contributions. (...)
87	Embodied Carbon Proposals for major residential and/or non-residential development will need to be supported by an Embodied Carbon Assessment that demonstrates a score of less than 900kg/sqm of carbon can be achieved within the development of the substructure, superstructure, and finishes.

- 2.2.7 It should be noted that these are draft policies which may not be adopted in their current form. However, it is the Applicant's view that the proposed development at Malmesbury should aim to achieve high levels of sustainability.
- 2.2.8 This Statement therefore looks ahead to the emerging Future Homes Standard and outlines the principles to be adopted to reduce embodied carbon, ensuring that the development will align with the broad aims of the emerging policy.

Wiltshire and Swindon Waste Core Strategy 2006-2026 (Adopted 2009)

2.2.9 The *Wiltshire and Swindon Waste Core Strategy* sets out the strategic policy framework for waste management and forms one element of the Wiltshire and Swindon Minerals and Waste Development Framework. It includes a set of policies designed to meet identified issues for waste management in the area, relevant extracts of which are included below:

Policy	Extract
WCS5	The Wiltshire and Swindon Waste Hierarchy and Sustainable Waste Management In the interest of sustainable waste management, the Councils will seek to drive waste up the hierarchy by ensuring that developers demonstrate that the most sustainable option for waste management in Wiltshire and Swindon has been promoted.
WCS6	Waste Reduction and Auditing Proposals for developments (...) will be required to design and provide facilities for occupiers of the development to recycle / compost waste (bring systems) and / or facilities within individual or groups of properties or premises for the source separation and storage of different types of waste for recycling and / or composting. (...) Such provision will be expected to have regard to the existing capacity of facilities already available and to the existing Recycling Plan or Municipal Waste Management Strategy relevant to the area. (...)

Malmesbury Neighbourhood Plan (February 2015)

2.2.10 The Malmesbury Neighbourhood Plan establishes a vision for the development of Malmesbury, setting out clear objectives to influence the area's growth. It forms part of the Development Plan for Wiltshire and includes two documents: Volume I (Main Body) and Volume II (Design Guide). It includes objectives focussed on sustainable design and encourages appropriate use of renewable technology.

Additional Planning Policy Documents

2.2.11 Further guidance exists relating to transport, parking, flood risk and ecology. These are covered in more detail in the other reports accompanying this submission. This Statement does however summarise the outputs of these reports where relevant to give a rounded picture of the approach to sustainable design and construction issues.

3 Sustainable Energy Strategy

3.1 Introduction

- 3.1.1 The proposed development at Malmesbury will be built to at least achieve the requirements of the Future Homes Standard which is due to come into force in 2025.
- 3.1.2 However, since the detailed requirements of the Future Homes Standard are still to be confirmed, and the fact that this application is in outline, there are areas within this section where a definitive solution cannot be provided.
- 3.1.3 Instead, this Sustainable Energy Strategy describes the design principles to be applied at the proposed development which will ensure that it will achieve the Future Homes Standard and, in doing so, will exceed the requirements of Core Policy 41 while satisfying many of the core themes of the submitted Draft Local Plan:
- The development will be 'zero carbon ready';
 - Space heating demand will be reduced by:
 - Balancing solar gain against overheating risk;
 - Applying 'fabric first' principles and adopting a highly efficient thermal specification.
 - Operational energy use will be reduced by:
 - Installing high efficiency lighting and appliances;
 - Installing low carbon air source heat pumps.
 - Energy will be generated on site via photovoltaic panels.
- 3.1.4 Further detail, accompanied by compliance calculations to demonstrate performance, can be provided at Reserved Matters and be secured by Condition if necessary.

3.2 The Energy Hierarchy

- 3.2.1 The Energy Hierarchy underpins the entire approach to building performance for this development, thus prioritising a reduction in the demand for energy as far as possible through thermally efficient, easily controlled, well designed and oriented buildings. This 'fabric first' approach is in line with the requirements of Core Policy 41 of the Wiltshire Core Strategy.

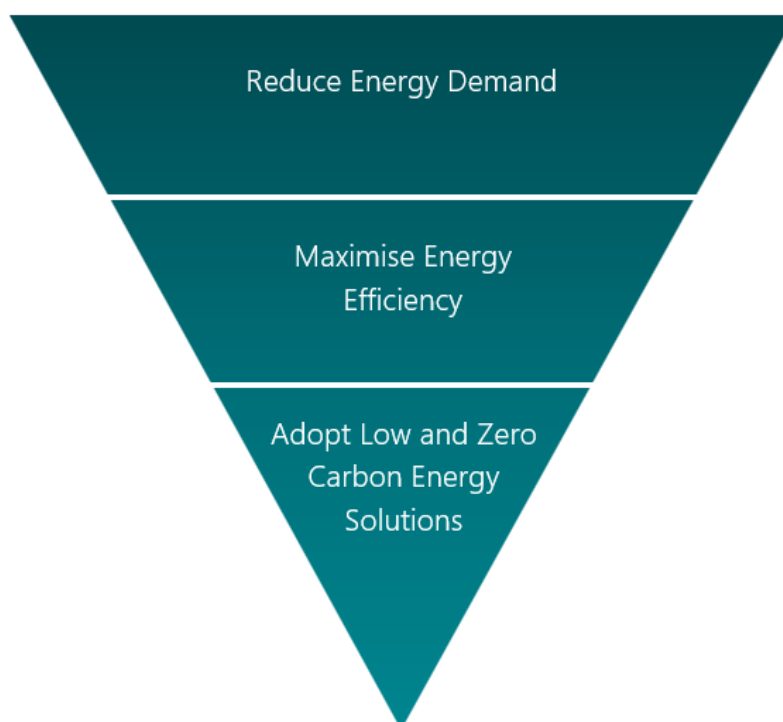


Figure 2: The Energy Hierarchy

3.3 Site Layout and Property Orientation

- 3.3.1 The orientation of buildings, along with the size and location of glazing and the extent of overshadowing, plays an important role in energy performance. Improving a building's orientation so that the main living spaces benefit from the heat and light of the Sun can reduce the requirement to use fuels to perform the same function thus reducing costs, energy use and associated carbon emissions.
- 3.3.2 When buildings have a southerly orientation, they can benefit from the Sun during the middle portion of the day without suffering from potential overheating later in the afternoon. This orientation can also help to ensure that they still benefit as much as possible from sunlight during the winter when the Sun's path is shortened.
- 3.3.3 However, there is a balance to be struck between maximising solar gain and the risk of overheating. Section 5 of this Statement discusses approaches to addressing and managing this risk which align with the requirements of Building Regulations Approved Document O.
- 3.3.4 The proposed layout of the site will be developed with respect to identified spatial, topological and visual constraints, all of which need to be carefully considered. Within these parameters, a

proportion of the properties will have a southerly orientation. Furthermore, the relatively low density of the development will ensure appropriate spaces around dwellings, reducing overshadowing.

3.3.5 The impact of orientation on the viability of photovoltaic panels is discussed in paragraph 3.5.8.

3.4 Highly Efficient Building Envelope

Thermal Elements

3.4.1 A 'fabric first' building specification will be developed to ensure that the envelope of each dwelling, including the wall, roof, floor, glazing and doors, will be highly energy efficient. This will reduce energy demand and increase comfort.

3.4.2 Thermal bridges will be minimised through the application of design details and products that provide continuous insulation, such as insulated lintels.

3.4.3 The specification will be confirmed at a later stage in the planning process once housetypes have been finalised and the details of the Future Homes Standard have been announced. It will be designed to ensure that the dwellings meet the Future Homes Standard as a minimum, with the option of further refining the specification should this be required by local policy.

3.4.4 Table 2 in Section 3.7 provides an indication of the levels of performance required, including u-values for different thermal elements.

3.4.5 Air Tightness

3.4.6 The air tightness of a building is important in reducing heat loss and in the prevention of draughts. It is also an important factor in managing interstitial condensation and reducing sound transmission through the structures.

3.4.7 The current target for the development will be to ensure the buildings are constructed with an air permeability level of c. $4\text{m}^3/\text{m}^2@50\text{Pa}$ to align with the emerging requirements of the Future Homes Standard.

3.4.8 Controlled Ventilation

3.4.9 The drive for air tightness will need to be matched by correctly designed and controlled ventilation, which becomes increasingly important as a result.

3.4.10 As the air tightness standard for the development currently targets a figure below $5\text{m}^3/\text{m}^2@50\text{Pa}$, it will be necessary to install a high efficiency mechanical extract ventilation unit (dMEV), ideally with heat recovery, as required by Approved Document F.

3.4.11 The dwellings will also benefit from natural cross ventilation via openable windows which will enable rapid purges of air and will contribute to good levels of internal air quality.

Lighting, Fixtures and Fittings

- 3.4.12 Further energy savings will be made by maximising the efficiency of appliances, lighting, fixtures and fittings.
- 3.4.13 All internal and external fixed electric lighting will be categorised as 'energy efficient' in line with regulations to minimise lifetime energy use and associated emissions.
- 3.4.14 All appliances where installed will be high efficiency, further minimising the use of both electricity and hot water. Moreover, where these are not installed, they will be provided to incoming residents within the list of optional extras. There will be space in all gardens for clothes drying to discourage the use of tumble dryers.
- 3.4.15 Taps and shower fixtures and fittings that reduce hot water consumption with low and/or aerated flows will be specified; more detail in relation to potable water management is provided in Section 6.
- 3.4.16 A further option that could be explored is the installation of Waste Water Heat Recovery units (WWHR) in those dwellings that can accommodate them. WWHR units enable heat to be recovered from the waste water produced in bathrooms via baths or showers. This heat is then used to pre-warm water in the system, and thus reduce the amount of energy needed to provide hot water for use within the property. The impact is a further reduction in energy use

3.5 Low Carbon Energy Supply

- 3.5.1 The UK is rapidly moving towards electrification of the heating system. Indeed, it is expected that the Future Homes Standard will not permit the installation of gas or oil boilers.
- 3.5.2 The Applicant has therefore confirmed that this development will not be connected to the gas network and will instead look to alternative options for energy supply and heating provision.

Air Source Heat Pumps

- 3.5.3 Air source heat pumps will be installed to provide space and water heating to all properties at this development.
- 3.5.4 High quality, well installed units can deliver a seasonal heating efficiency in excess of 300%, significantly reducing both operational costs for occupiers and carbon emissions when compared to gas or direct electric baselines.

- 3.5.5 The heat pump solution will ensure the homes are 'zero-carbon ready', setting the development on a trajectory to net zero emissions over time: the rapid expansion in renewable and low carbon energy supply within the Grid in recent years means that Grid electricity is considerably cleaner per unit than natural gas, and will continue to decarbonise over time:

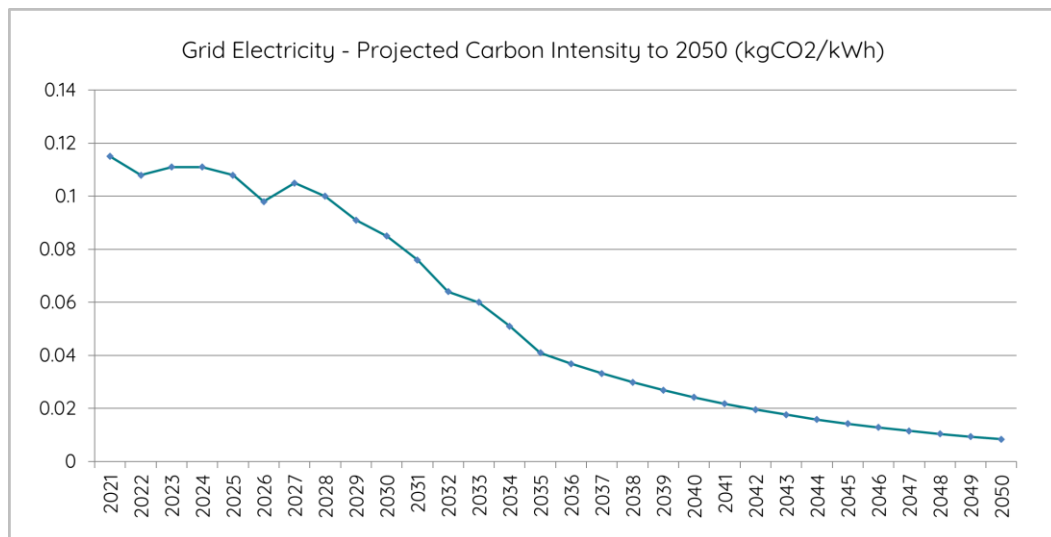


Figure 3: Projected Grid Decarbonisation

Solar Photovoltaics

- 3.5.6 Photovoltaic (PV) panels will be installed to complement the heat pump solution where appropriate. This option will result in further carbon reductions and energy cost savings by generating electricity on-site.
- 3.5.7 The quantity of PV installed at each property will be determined later at the Reserved Matters stage once housetypes have been designed and the details of the Future Homes Standard have been finalised.
- 3.5.8 The PV panels will be roof integrated to minimise visual impact, so the orientation and design of the buildings and roofscapes will be carefully considered. The designs will avoid roof features on southerly orientations that significantly limit the installation of PV, such as hipped roofs and dormers. Certain elevations will also be avoided where possible, including those facing WNW or ENE (although it is recognised that orientation to maximise solar PV potential is just one of many considerations when determining residential development layouts). Increasingly, east-west facing split systems are being adopted, providing a more even amount of generation through the day, without any significant loss in annual output. It should not therefore be assumed that all roofs need to face between south east and south west when finalising the layout.
- 3.5.9 PV diverters may also feature within homes - these allow excess electricity produced during the summer months to be diverted to the hot water tank to generate domestic hot water. This minimises any export and maximises the benefits to the resident.

Smart Meters and Control Systems

- 3.5.10 The dwellings will feature smart control systems to help future residents maximise the efficiency of their heating and energy generation systems. This is likely to include highly granular time and temperature zone control and weather compensation. Clear and straightforward system user guides will be provided to incoming residents as part of their welcome packs.
- 3.5.11 Smart meters will also be installed in each property in line with regulations and supplier requirements.
- 3.5.12 In addition, the introduction of domestic energy storage (battery) systems will be considered where PV is installed, potentially as an optional extra for incoming residents. The use of battery technology provides far greater flexibility and control for residents, enabling them to benefit from the value of the energy generated and to capitalise on flexible tariffs designed for heat pump users.

3.6 Indicative Specification

- 3.6.1 Due to the outline nature of this application and the fact that the details of the Future Homes Standard are still being finalised, it is not possible to provide an exact specification for the dwellings.
- 3.6.2 Table 2 instead provides a summary of the *indicative* levels of performance which will be applied at the proposed development. This has been compiled using the notional building specifications for homes under the Future Homes Standard Option 1.

Element Type	Indicative Specification for the Proposed Development
Roof / Sloped Roof	0.11 W/(m ² .K)
External walls	0.18 W/(m ² .K)
Ground floor	0.13 W/(m ² .K)
Glazing	1.2 W/(m ² .K)
Doors	1.0 W/(m ² .K)
Air permeability	4.0m ³ /m ² /hour@50Pa
Ventilation system	dMEV
Heating system	Air source heat pump
Photovoltaic system	High efficiency panels

Table 2: Summary of Indicative U-Values and Specifications

- 3.6.1 The precise specification to be applied at the site will be for determination as part of a Reserved Matters application. At that point, detailed energy calculations can be provided, demonstrating more accurately the impact of the proposed approach and how it complies with the local policies and national regulations in place at that point.
- 3.6.2 This includes the Future Homes Standard plus the Regulation 19 Pre-Submission Draft Local Plan, should it be adopted before the point of determination.

4 Reducing Carbon Emissions from Transport

4.1 Introduction

- 4.1.1 This section provides a summary of how transport related carbon emissions have been considered during the early design stages for the proposed development, within the 'avoid, shift, improve' framework.
- 4.1.2 These issues are comprehensively addressed in the Transport Assessment and associated Travel Plan completed by i-Transport which accompany this application, and which should be referred to for full details.

4.2 Avoiding Travel

Provision of Fibre to the Premises

- 4.2.1 The availability of high-quality, reliable broadband infrastructure is increasingly viewed as critical to the functioning of a development and its continued attractiveness to incoming residents.
- 4.2.2 Indeed, such provision can facilitate better home working, enabling clear video calling and effective file sharing, all of which can contribute to a reduction in commuting.
- 4.2.3 Better quality, reliable internet connections for all have wider social ramifications too – reducing the risk of exclusion, a lack of access to services (which are increasingly internet based) and enabling people to better connect with society as a whole.
- 4.2.4 The provision at the development will align with *Approved Document R Volume 1 (2022 Edition)* which sets out requirements to ensure that, during construction, all new homes are installed with the fastest broadband connections available.

4.3 Shifting Away from Private Car Use

Accessibility

- 4.3.1 Accessibility is a key aspect of sustainability and is described as such in the NPPF. Any new development needs to have easy to use, safe and obvious links into the surrounding community to prevent isolation and disconnection, to encourage the use of existing facilities and to facilitate commuting. Core policies 60 and 61 of the Wiltshire Core Strategy reinforce this, stating that developments should be planned in accessible locations, and that they should be located and designed to reduce the need to travel, particularly by private car.
- 4.3.2 The proposed site is in a very accessible location, with a range of local facilities within a comfortable and safe walking/cycling distance. For example, there is a supermarket and garden centre within approximately 0.5km and shops, cafes, a medical centre and a library less than 2km away in Malmesbury town centre. The local primary school is approximately 500m from the site and the secondary school, 1.2km. There are cricket pitches, football pitches and tennis courts all within walking or cycling distance.

Sustainable Transport Options

- 4.3.3 As described in the Transport Assessment, the site is well situated to make the most of existing road networks, public transport provision and public rights of way (PROW).
- 4.3.4 The streets and paths within the development will link to the existing PROWs, which include footpath MALM7 through the site and MALM6 and MALM8 which run along the site boundaries. This network extends through to the town centre and neighbouring developments, providing safe and accessible routes to the nearby facilities. A National Cycle Route runs through the town centre and is easily accessed via the PROW.
- 4.3.5 While final designs will be detailed as part of a reserved matters planning application, all the proposed properties will include a secure and weatherproof means of cycle storage: for example, some of the houses will have garages and those that do not can have sheds provided. Any flats will have access to a secure communal cycle store.
- 4.3.6 There are a number of bus stops within a short walking distance, including on the A429 and the B4014 and within the existing settlement directly west of the site. These provide regular services into nearby towns and villages including Chippenham, Cirencester and Swindon.
- 4.3.7 The draft Travel Plan completed by i-Transport for the development encourages modal shift away from private vehicles towards more sustainable forms of travel, as required by Core Policy 61. The Plan outlines a number of measures including the production of a Travel Information Pack for residents to inform and promote public transport, walking and cycling, and the promotion of local car share databases to reduce car journeys from the site.

4.4 Improving Technology

Provision of Electric Vehicle Charging Points

- 4.4.1 Increasingly, energy and transport systems are becoming interlinked as the nation transitions from the use of petrol and diesel vehicles to zero emission solutions based around electric charging.
- 4.4.2 There is therefore a need to provide charging infrastructure to support this wholesale shift to cleaner vehicle technology and this is supported by policy: Approved Document S of the Building Regulations described in Section 2 sets out the comprehensive standards and detailed specifications required at new residential development.
- 4.4.3 The Applicant will design and manage the power network to provide the level of EV charging infrastructure required by Approved Document S. To this end, each dwelling with associated parking will have EV charging infrastructure installed.
- 4.4.4 Approved Document S should be referred to for full details including installation requirements, the cost cap and standards for charging points and cable routes.

- 4.4.5 The full details of the EV charging provision to be installed on the proposed development will be confirmed at the appropriate stage in the planning and design process.

5 Climate Resilience and Adaptation

5.1 Adapting to the Future

- 5.1.1 The ability of the development to adapt to anticipated future changes in the climate is an important aspect of its longevity, and ultimate habitability. The principle of adaptation applies to both the built and external environment, and indeed how they interact.
- 5.1.2 This section discusses ways in which the Applicant is addressing climate resilience and adaptation on site in line with Core Policy 41 of the Core Strategy, which requires that developments consider climate change adaptation through careful and considered design.

5.2 Reducing Overheating Risk Through Design

- 5.2.1 The risk of the overheating of living spaces is of increasing concern, given our knowledge of future climate. Approved Document O details requirements for mitigating this risk in new residential dwellings and methods for demonstrating compliance, including the use of either a compliance checklist or the *CIBSE Guide TM59 Design Methodology for the Assessment of Overheating Risk in Homes* (CIBSE, June 2017).
- 5.2.2 The dwelling designs will undergo overheating risk modelling using the CIBSE TM59 methodology at the appropriate design stage. In order to provide a robust analysis, and in the context of a changing climate, the use of a 'future weather' file will help ensure that we can be more certain of the impact in the future, and the resulting efficacy of the solutions put forward where any overheating risk exists.
- 5.2.3 Acceptable strategies for reducing overheating risk described in Approved Document O focus on passive design features and include:
- Limiting solar gains:
 - Fixed shading devices such as shutters, external blinds, overhangs or awnings;
 - Glazing design including size, orientation, glass g-value and depth of window reveal;
 - Shading provided by adjacent permanent structures.
 - Removing excess heat:
 - Opening windows and ideally cross ventilation;
 - Ventilation louvres in external walls;
 - A mechanical ventilation system;
 - A mechanical cooling system as a last resort.

5.3 The Multiple Benefits of Open Space and Vegetation

- 5.3.1 The proposals feature large areas of public open space including informal parkland and play spaces. These areas will provide a range of valuable habitats, including grassland, wildflower meadow and native shrub. Many of the existing mature trees and hedgerows around the site boundaries will be retained and enhanced with additional planting, and attenuation basins will provide opportunities for wetland marginal species.
- 5.3.2 This landscape led approach will provide multiple benefits in a changing climate:
- The deciduous trees will provide shading in the summer months, reducing heat gain into dwellings and therefore reducing the need for mechanical cooling;
 - Trees throughout the site will also help maintain a comfortable external environment in hot periods by providing shading in gardens and shared spaces and reducing any urban heat island effect;
 - The trees, hedges and shrubs will contribute to the reduction of wind speeds, improving comfort levels and reducing air infiltration into buildings on windier days;
 - Vegetation acts as a 'carbon sink' and improves air quality through dry deposition of gases (including NO_x, SO_x, PM₁₀ and O₃);
 - Trees, hedges and shrubs also help reduce levels of ambient noise.
- 5.3.3 This landscape led approach will also result in biodiversity gains through ecosystem improvement. The Preliminary Ecological Appraisal for the site completed by EAD Ecology should be referred to for full details in this regard.

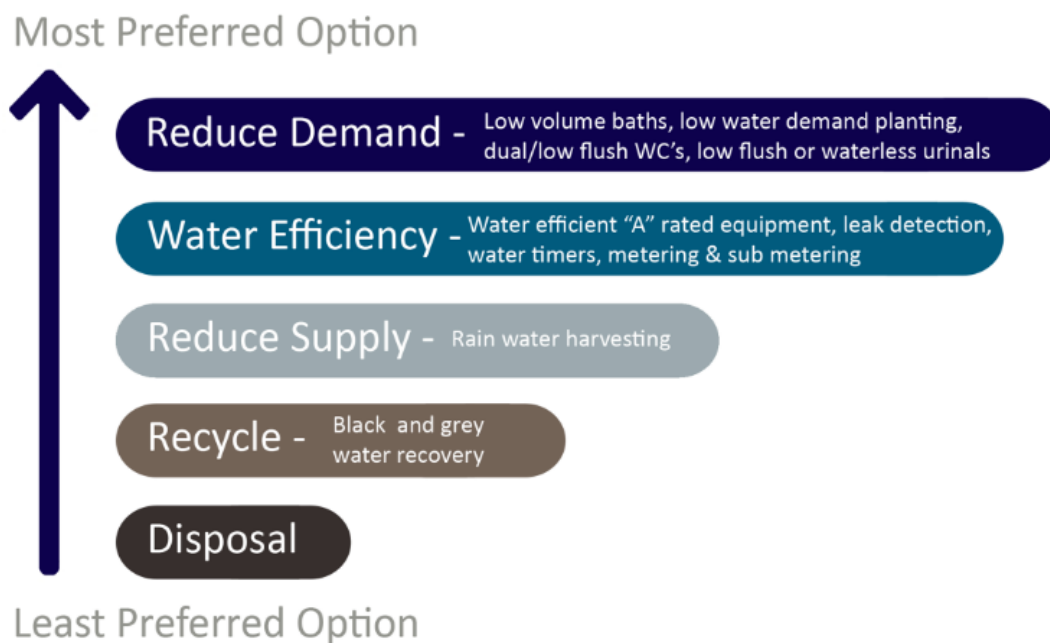
5.4 Managing Water in a Changing Climate

- 5.4.1 Any new development on a previously undeveloped site will inevitably increase the amount of hard standing (roofs, roads, pavements) and therefore the amount of surface water run-off. The integration of different Sustainable Urban Drainage (SuDS) features into the landscape layout will therefore be pivotal in its development, in order to enable the necessary storage volumes associated with a 1 in 100 year storm event, plus a 40% allowance for the impacts of climate change on rainfall distribution throughout the year.
- 5.4.2 The Flood Risk Assessment (FRA) which accompanies this application provides further details in relation to the level of flood risk and the management of surface water flows at the proposed development and this should be referred to for full details in this regard.
- 5.4.3 As housetypes are developed later in the planning process, consideration should also be given to design features such as increased diameter guttering and downpipes to cope with additional intensity of storm water.

6 Water Efficiency

6.1 The Water Hierarchy

- 6.1.1 Water efficiency becomes increasingly important in a changing climate with diminishing water resources.
- 6.1.2 Policy 41 of the Core Strategy refers to the *Code for Sustainable Homes* Level 4 which required all new residential developments to achieve a water efficiency equivalent of 105 litres per person per day (l/p/d). When the *Code for Sustainable Homes* was abolished, this water efficiency target was replaced by the enhanced standard set out in Approved Document G, which requires a water use of 110 l/p/d. The national average for water consumption is around 143 l/p/d.
- 6.1.3 However, the Applicant is committed to very high levels of sustainability across the site and aims to exceed both of these requirements to achieve a water efficiency equivalent of 100 l/p/d.
- 6.1.4 In order to do so, the management of water on the proposed development will follow the principles of the Water Hierarchy:



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Figure 4: The Water Hierarchy

6.2 Water Reduction Measures

6.2.1 A large proportion of the potable water consumed in a domestic setting is used for washing (personal and clothes) and WC flushing:



Figure 5: Domestic Water Consumption by End Use

6.2.2 Considerable savings can therefore be made by specifying water efficient fixtures, fittings and appliances complemented by rainwater recycling (water butts) so that daily water use will not exceed the 100 l/p/d target. The following table is an illustrative list of specifications which typically achieve this:

	Measure	Unit	Performance / Specification
1	Showers	Litres per minute	9
2	Aerated taps	Litres per minute	3
3	Kitchen sink taps	Litres per minute	4
4	Bath	Litre capacity to overflow	140
5	WC	Litres per flush	4 / 2.6 (dual flush)
6	Washing machine	Litres per kg dry load	7
7	Dishwasher	Litres per place setting	1.08

Table 3: Illustrative Water Specifications

6.2.3 The final specification will be confirmed at detailed design stage, at which point the accredited calculation methodology for Approved Document G can be used to demonstrate that it will meet the required standard.

7 Embodied Carbon and Waste Management

7.1 Introduction

- 7.1.1 Embodied carbon refers to the 'upfront' emissions associated with building construction, including the extraction and processing of materials, and the energy and water consumption in the production, assembly, and construction of the building. It also includes the 'in-use' stage (e.g. maintenance, replacement), and the 'end of life' stage (demolition, disassembly, and disposal) plus any transportation. Broadly speaking, these, alongside the operational emissions described in Section 3, make up the Whole Life Carbon (WLC) associated with a development.
- 7.1.2 The emerging Local Plan contains a draft policy which states proposals for major residential development should be supported by an Embodied Carbon Assessment that demonstrates a score of less than 900kg/sqm of carbon.
- 7.1.3 While this draft policy may not be adopted in its current form, it demonstrates a commitment to the issue of embodied carbon reduction. This section therefore sets out the overarching principles which the Applicant will apply at later stages of the planning and development process to ensure that the issue of embodied carbon is addressed, and that waste arising from the development (both during its construction and operation) is appropriately managed.

7.2 Sustainable Building Materials

- 7.2.1 The extraction, manufacturing, refinement and transportation of a raw material will all contribute to its embodied carbon. The sourcing of materials used on the development will therefore be a key consideration.
- 7.2.2 Materials with low embodied carbon will be prioritised where possible:
- The embodied carbon of each material type will be considered to ensure that informed decisions can be made about the types and quantities of each to be used on site;
 - Materials derived from recycled, repurposed or reused products will be specified where possible;
 - Low carbon concrete mixes will be used where appropriate;
 - Less carbon-intensive materials will be used in place of more carbon intensive materials where possible;
 - Robust systems and products with long lifespans will be prioritised;
 - Local suppliers of materials will be used where viable to reduce transportation.
- 7.2.3 The homes will be designed with a palette of materials that is both appropriate and in keeping with the local architectural vernacular. As such the form of construction will not require the use of unusual materials, those with significant environmental impact or those that require significant off-site processing and development before use on site.

7.2.4 In addition, suppliers that have recognised environmentally focused accreditations and management systems such as ISO:14001 will be used, and all timber will be sustainably sourced with full FSC or PEFC accreditation.

7.3 Designing for Durability and Flexibility

7.3.1 Later in the design process, the durability, flexibility and adaptability of the dwellings can be considered:

- Ensuring there is synchronicity between materials selected and building life expectancy reduces waste and the need for replacement (and reduces in-use costs);
- Ensuring the building is adapted now to future climate scenarios means it is futureproofed without the need for future intervention;
- Flexible layouts will allow homes to be reconfigured over time to suit residents' changing needs.

7.3.2 By designing homes in this way from the outset ensures building longevity and minimises the need for extensive refurbishment which has implications for waste minimisation and embodied carbon.

7.3.3 Adapting a building to future climate scenarios is discussed in more detail in Section 5.

7.4 Sustainable Waste Management

- 7.4.1 Waste generation, storage, treatment and disposal before, during and after construction will be managed in accordance with the Waste Hierarchy. This is in line with the Wiltshire and Swindon Waste Core Strategy Policy WCS5 which requires developers to demonstrate that the most sustainable option for waste management has been promoted.



Figure 6: The Waste Hierarchy

Construction Waste

- 7.4.2 A Waste Management Plan will be developed and implemented for the development and will:
- Identify a lead person responsible for the Waste Management Plan delivery;
 - Provide site induction and training to all staff;
 - Identify waste streams, plan for their management and set targets for waste reduction;
 - Identify suitable locations for the efficient separation and storage of waste prior to removal from site to encourage higher levels of recycling;
 - Identify opportunities for the on-site reuse of materials including excavated materials;
 - Re-use scaffolding, hoarding and other such materials on subsequent construction projects.
- 7.4.3 Where waste must be removed from the site, only licenced waste management contractors with a proven track record of delivering high levels of recycling will be appointed. In addition, it will be a requirement that any contractor operating on the site commits to the Considerate Constructors Scheme. This will help further minimise the impact on the surrounding area and neighbours to the site.

Operational Waste

- 7.4.4 Property occupants will be encouraged to manage waste sustainably in line with Policy WCS6 of the Waste Core Strategy, and this will be considered in full at the Reserved Matters stage.
- 7.4.5 For example, houses will have a private rear garden area with direct external access while any flats will have communal waste storage facilities. These features will provide sufficient space for bins and composting facilities, keeping waste storage away from the public domain. Discrete refuse collection points will also be provided along any shared private drives in line with regulations.
- 7.4.6 Facilities will be easy to access and will be designed in line with the collection regime of the council.

8 Summary

- 8.1.1 This *Energy & Sustainability Statement* describes how the proposed development on land north of Whychurch Farm and west of Crudwell Road in Wiltshire will adopt sustainable construction principles with a focus on climate change mitigation and adaptation. It has been commissioned by Gleeson Land (the Applicant).
- 8.1.2 Throughout the Statement, national and local planning policy objectives and standards have been addressed to demonstrate the Applicant's commitment to these issues.
- 8.1.3 In particular, the Statement provides as much detail as is possible at this stage in the planning process to demonstrate that the proposals will achieve the Future Homes Standard and will meet and indeed exceed the relevant requirements of *Wiltshire Core Strategy (Adopted January 2015)* to create a highly sustainable development:
- The dwellings will be highly energy efficient, adopting a fabric first approach. They will be orientated to maximise solar gain where possible;
 - There will be no natural gas connection to the site;
 - Heating and hot water will be supplied via highly efficient low carbon air source heat pumps which will be complemented with PV panels where appropriate;
 - High quality broadband will be provided in line with Approved Document R;
 - Accessibility to local services and sustainable transport options will encourage residents to prioritise active travel and public transport;
 - Electric vehicle charging points will be installed in line with policy requirements;
 - Buildings will be designed and specified to adapt to a changed climate:
 - Overheating will be managed through considered design;
 - The retention of existing trees and additional planting will provide more comfortable microclimates in warmer weather;
 - The landscape design will provide multi-functional benefits, supporting increased biodiversity and enhancing the overall aesthetic;
 - Surface water will be managed via the integration of SuDS into the development.
 - The development will employ a combination of highly efficient fixtures, fittings and appliances to reduce domestic water use to achieve the 100 l/p/d target;
 - Embodied carbon will be reduced by applying sustainable design principles, including informed material selection and the use of re-used and recycled materials during construction;
 - Demolition, construction and operational waste will be managed in accordance with the principles of the Waste Hierarchy.

- 8.1.4 As the planning and development process progresses, and as the wider regulatory environment develops, the approach proposed will be kept under review. The final design solution and associated detail will be provided at the Reserved Matters stage.
- 8.1.5 A summary of the recommendations made in order to achieve policy requirements is provided in Appendix A.

9 Appendix A – Key Recommendations

Section		District Plan Policies Addressed	Key Recommendations
3	Sustainable Energy Strategy	Wiltshire Core Strategy Policy 41 Policy 57	- Follow the priorities of the Energy Hierarchy - Ensure building orientation is such that dwellings maximise solar gain as far as possible - Minimise energy consumption with a highly efficient building envelope - Air permeability levels should be c.4m³/m²@50Pa or less - Install a high efficiency mechanical extract ventilation unit to each dwelling to ensure sufficient ventilation - Install energy efficient lighting and appliances - Install low carbon air source heat pumps to each dwelling on the development - Complement the ASHP solution with PV systems where appropriate
4	Reducing Carbon Emissions from Transport	Wiltshire Core Strategy Policy 61	- Provide broadband infrastructure in line with the requirements of Approved Document R - Implement the Travel Plan for the site - Provide EV charging points to all properties with associated parking in line with the requirements of Approved Document S
5	Climate Resilience and Adaptation	Wiltshire Core Strategy Policy 41	- Control overheating risk by applying requirements of Approved Document O: Overheating where overheating is identified as an issue - Include street trees, shrubbery and open spaces on the site - Incorporate SuDS into the site design to manage surface water drainage as recommended in the FRA
6	Water Efficiency	Wiltshire Core Strategy Policy 41 Policy 67	- Specify fixtures, appliances and fittings that reduce potable water use including aerated taps, low/dual flush WCs, low capacity baths - Provide opportunities for rainwater recycling i.e. rainwater butts
7	Embodied Carbon and Waste Management	Wiltshire Core Strategy Policy 57 Waste Core Strategy Policy WCS5 Policy WCS6	- Source materials with low embodied carbon from suppliers with environmental accreditations, using local suppliers where possible - Design buildings for durability and flexibility - Follow the priorities of the Waste Hierarchy - Ensure contractors implement strict waste management processes and commit to Considerate Constructor Scheme - Consider opportunistic on-site reuse of materials where feasible - Provide sufficient and accessible bin storage to facilitate waste management and recycling

Completed on behalf of:

Gleeson Land

By:

Daedalus Environmental Limited
61 London Road
Maidstone
Kent
ME16 8TX

E: enquiries@daedalusenvironmental.co.uk
W: www.daedalusenvironmental.co.uk

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