Welwyn Hatfield Borough Council

Sustainability Supplementary Planning Document

WELWYN HATFIELD

CORE

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Introduction

1.1 Sustainability is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own. In 1987, the United Nations General Assembly agreed a definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

1.2 Whilst this is largely thought of in terms of climate change and a need to reduce the carbon emissions which are causing this change, it is not exclusively about this and the National Planning Policy Framework (NPPF) identifies three interdependent objectives of sustainable development: economic, social and environmental.

1.3 It is important that development in Welwyn Hatfield is sustainable, and that developers and applicants who make significant efforts to increase the sustainability of their proposed developments have this recognised.

Climate Change and Environmental Sustainability

1.4 Climate Change is the greatest threat humanity has ever seen.

1.5 It is unequivocally scientifically proven that the burning of fossil fuels is the main cause of climate change, through human activities, and it is the unprecedented speed of change that is most alarming. The speed of change is increased due to positive feedback loops, which amplify the effects of climate change. For instance, permafrost is melting at faster rates due to the rising global temperature, which is releasing large stores of methane (an even more potent greenhouse gas than carbon dioxide) into the atmosphere which further exacerbates global temperature rise.

1.6 To slow down this rate of change, we need to reduce emissions (to limit the amount of carbon dioxide in the atmosphere) and enhance the natural environment (to capture and store carbon dioxide). The Royal Town Planning Institute (RTPI) and Town and Country Planning Association (TCPA) have jointly published guidance on this issue as the planning system plays an important role in reducing carbon emissions, delivering sustainable communities and helping ensure that communities are as ready as possible for the impacts of climate change.

1.7 We also need to start adapting to the changing climate, because firstly, at a more local level we are already experiencing impacts of climate change in the form of wildfires, flooding, heatwaves and droughts and secondly because the effects of climate change will be experienced for many years to come due to the time lag between what we do and when we feel it and the long lifespan of greenhouse gases. Building resilience and adapting to the impacts of climate change will play a crucial role in planning decisions moving forward, to ensure a sustainable future for ourselves and our community.

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Introduction

Local Context and Climate Emergency

1.8 The Department of Energy Security and Net Zero publish annual Greenhouse Gas emission figures from all local authorities. The most recent data from 2022 shows that Welwyn Hatfield Borough was responsible for 569.5 kt of CO2 emissions.

1.9 There has been a steady decline (37% decrease) since the baseline year of 2005. However, emissions still need to decrease further.

1.10 In 2019, Welwyn Hatfield Borough Council recognised this situation and declared a climate emergency. In support of this, the Council set targets to be net zero as an organisation by 2030 and as a borough by 2050. The Council has also updated the Corporate Priorities, to reflect our climate ambition, and have 'Action on Climate' as a key priority, with the following objectives:

- Renew our commitments to be a net zero Council by 2030 (and as a borough by 2050)
- Step up climate change adaptation and mitigation measures
- Lead by Example and encourage others to make positive change
- Increase and promote biodiversity

1.11 In practice, this means a focus on reducing emissions both generated as a result of the Council's work, and using its position and influence to help reduce those of others where possible. It also means embedding environmental sustainability into everything the Council does.

1.12 This approach has fed into the Council's Corporate Priorities and Corporate Plan for the 2024 – 26 period: Communities at our Heart.

1.13 In addition, the Council have recently published a Transition to Net Zero Strategy, which provides an overall vision of what our net zero borough will look like and outlines the pathway to achieving our targets. This Sustainability SPD will help support and guide residents so they can make informed choices and play their part in our borough wide journey.

1.14 Welwyn Hatfield are part of the Hertfordshire Climate Change and Sustainability Partnership, which includes all 10 districts and boroughs, the County Council and Hertfordshire Futures (formerly the Hertfordshire Local Enterprise Partnership). The remit of the group is to collaborate and identify joint work programmes on environmental, climate change and wider sustainability issues.

Economic Sustainability

1.15 The NPPF defines economic sustainability objectives as those that "help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types

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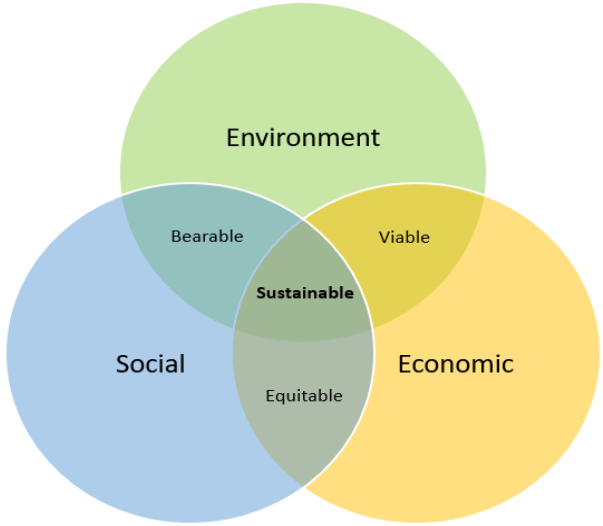
is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure".

Social Sustainability

1.16 The NPPF defines social sustainability objectives as those that "support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being"



How to Use This Document

1.17 A high level of carbon emissions and associated impact on sustainability come from activities requiring planning permission; both in the form of the development (embodied carbon) and in the use of that development after it has been completed (operational carbon).

1.18 Whilst regulation and policy exists to set certain standards, developers and applicants often seek to go beyond that, and this document outlines requirements and highlights opportunities to seek a higher standard of development. Where higher standards are pursued, it is only right that this is recognised where possible, and conscious efforts to go beyond the standards set out in policy are treated as a material consideration when planning applications are considered. Please note that the standards detailed in this document are correct at the time of writing, but updates to regulations i.e. Building Regulations may be required in the future. Standards detailed in this document should be cross-referenced with the latest Approved Documents.

1.19 In addition, there are some areas where policy would benefit from greater clarity and this document seeks to provide this where possible. An example of this with the provision of Electric Vehicle (EV) charging in new developments – whilst Local Plan policy SADM3 says that development proposals should make provision where appropriate for facilities for plug in or other ultra low emission vehicles, and building regulations set standards

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Introduction

for new residential developments, these need adapting to the Borough's specific circumstances and greater clarity is needed for commercial and other non-residential developments.

1.20 Each chapter of this SPD sets out the national and local policy context around the subject. It then describes approaches to addressing the issue. There are requirements set out in policy; generally the Welwyn Hatfield Local Plan (adopted October 2023) but elsewhere where appropriate, and this is what developments **must** do. However, there are often opportunities to go beyond the standard and to be more ambitious. This SPD splits this into two, into measures which developers **should** or **could** adopt:

- **'must'** means that the measure is a minimum requirement and would be policy and legislation compliant. 'Must' measures form part of the whole development process, and some requirements are assessed outside of the planning process i.e. Building Regulations. These may change over time, and developments will be expected to adhere to the latest requirements.
- **'should'** means something which would be expected and is seen as best practice.
- **'could'** means something which is more aspirational and exceeds both policy compliant and best practice.

1.21 It is important to measure efforts which developers make to go beyond policy and legislative requirements. As part of the planning application process, applicants should set out what they have done to exceed requirements in a Sustainability Summary document, and the template set out in the final chapter of this document should be used.

1.22 Efforts to go beyond policy requirements and to use "could" and / or "should" measures will be treated as a material consideration in the planning application process. Measures set out at Outline application stage should be carried forward into Reserved Matters applications, and conditions will be imposed to ensure that subsequent applications deliver those measures agreed at Outline stage. The level of detail provided at Outline stage will be dependent on the matters reserved.

1.23 As the topic of sustainability is a very broad one, it has not been possible to include all areas it covers within this document, though subsequent revisions may include additional areas, including those relating to economic or social sustainability. This document focusses on environmental sustainability. However, developers and applicants should not limit themselves to addressing just the areas covered in detail in this document.

1.24 As with most elements of construction, measures to improve sustainability are most cost effective to install at the time of construction rather that to "retro fit" afterwards. However, it is recognised that the Borough already has an extensive stock of buildings, the vast majority of which

will still be here many years in the future, and that many householders will want to make improvements to their own homes. Many of these improvements can be undertaken without planning permission using permitted development, whilst others will require planning permission.

1.25 This SPD is intended for developers, landowners and applicants on new schemes, but the Council is keen to encourage individual property owners to undertake improvements to improve the environmental performance of their property. Information on retro fitting and guidance on whether particular measures on individual properties will need planning permission or not can be found on the Council's website.

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Passive Design and Layout

Introduction

2.1 The design of a building has numerous effects on the energy consumed by a building and therefore its efficiency. Passive design principles use the site context, such as location, orientation, solar angle, shading, wind direction and more to generate the building's form and massing, the spatial planning around buildings and the location of buildings within the site boundary. The consideration of these aspects can have notable effects on heating, ventilation, lighting and cooling of buildings by 'passive' measures rather than 'active' measures.

Passive Design Policy and Guidance Context

	National	Local
Policy/ Legislation	National Planning Policy Framework – Meeting the challenge of climate change, flooding and coastal change Building Regulations – Part F, Part L, Part O	Welwyn Hatfield Local Plan – Policy SP9, SADM11, SP10, SADM13
Other Considerations	Overheating in New Homes - Good Homes Alliance	Hertfordshire Building Futures Sustainable Design Toolkit –
	Retrofit-Playbook.pdf (ukgbc.org) The Nature Recovery and Climate Resilience Playbook | UKGBC Embodied Carbon - Practical Guidance | UKGBC Embodied Carbon | UKGBC LETI - Home | LETI HCCSP - Building Retrofit (hccsp.org.uk)	Energy and Climate Change Technical Module Hertfordshire Development Quality Charter

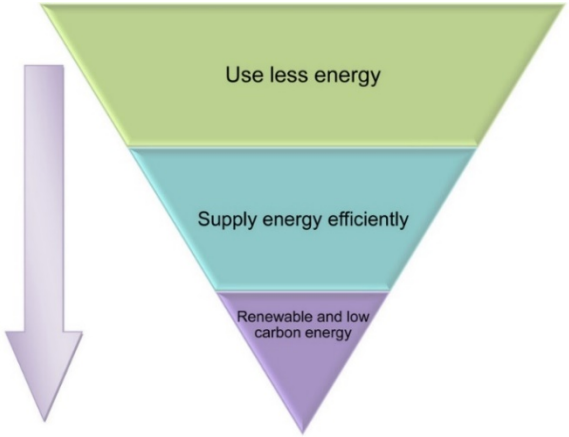
Local Plan Requirements – Passive Design

2.2 Policy SADM 11 requires buildings have satisfactory levels of sunlight and daylight, and also requires dual aspect dwellings (wherever feasible) to enable passive ventilation.

2.3 Policy SP 9 states that taller buildings will need to consider matters such as shadowing, micro-climate and wind tunnelling.

Passive Design and Layout

2.4 Policy SP10 refers to the Council's energy hierarchy (pictured below) and requires the layout and design of the site and building(s) reflect the energy hierarchy to maximise reduction of carbon emissions.



Other Policy Considerations

2.5 **Hertfordshire Climate Change and Sustainability Partnership: Strategic Action Plan for Carbon** [1]:Whilst this Action Plan focuses on net zero carbon across Hertfordshire, passive design seeks to reduce energy consumption and therefore carbon emissions.

2.6 **The Building Futures Sustainable Design Toolkit** [2]: The Design Toolkit features a technical module on energy and asks applicants to answer the following questions:

- How will energy demand for heating, lighting and cooling be avoided?
- What energy efficiency solutions will be used to further reduce energy demand in the new development?
- How will the site and building(s) be made resilient to climate change and reduce its contribution to external overheating?

Objective: Reduce the need for artificial lighting, heating, cooling and ventilation in domestic and non-domestic buildings

Passive Solar Gain, Cooling and Overheating

2.7 Passive solar gain refers to the process of a building being heated and lit by the sun. This can happen directly from sunlight passing through a window and heating the inside of a building, or indirectly as sunlight warms the external fabric of a building and the heat travels to the interior. Passive solar gain can make a significant contribution towards the lighting and heating of a building, and can therefore reduce the need for a building to be heated and

1 HCCSP Strategic Action Plan for Water 2023
2 Sustainable Design Toolkit (hertfordshire.gov.uk)

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Passive Design and Layout

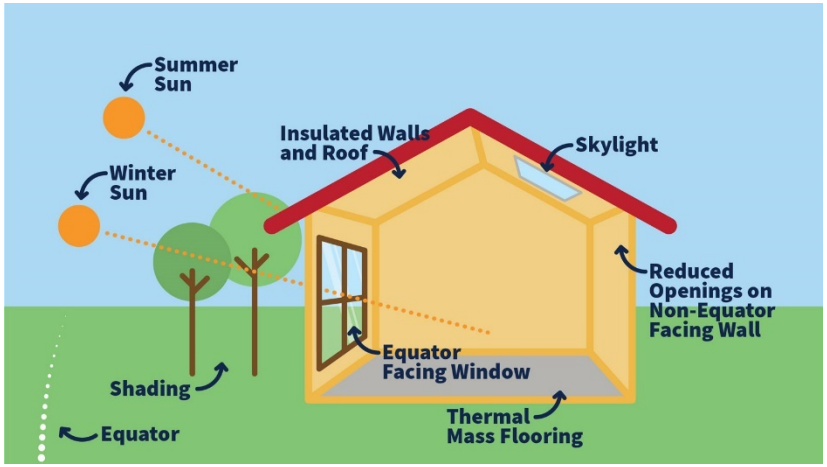
lit actively via the consumption of electricity and/or gas. Key factors that influence the impact of passive solar gain are:

2.8 **Physical characteristics of the site** – the site's topography and orientation can have a large impact the amount of sun a building can receive during the day, especially during winter months.

2.9 **Immediate surroundings** – other buildings, trees etc can intercept the sun and cause shading, affecting the ability for buildings to benefit from solar gain.

2.10 **Orientation of buildings** – Maximising a building's access to the sun will have a great impact on solar gain. For example, buildings should have their main elevations facing within 30° of due south. A slight easterly orientation can also have benefits such as maximising early morning light and heat gains, which is typically when a building is consuming the most amount of energy for heat and light demand.

2.11 **Materials** – The use of certain building materials can absorb excess heat during warmer periods and release it slowly during cooler periods. This can be especially effective during day/night transitions where days are warm, but nights are cool.



2.12 **Form factor** – The form factor on a building is a simplified way of measuring the efficiency of a building's shape. This is done by means of a ratio between the external surface area and the internal treated floor area. The internal treated floor area is the area that is heated and therefore consumes energy, and the external surface area is the area where heat is typically lost to the outside. The lower the ratio between the two, the slower the heat loss will be for the same level of fabric performance.

2.13 **External design** – External design features can have a large impact on solar gain. Design aspects include:

- The size of windows
- Roof overhang – can provide shading from the sun in summer months but allow solar gain in winter months

Passive Design and Layout

- External shuttering (including active shuttering such as 'brise soleil' systems
- Deep window/door projections
- Photochromatic/thermochromic glass
- The use of lighter colours in external building materials – this can reduce the effect on solar absorption which, during the warmer part of the year, can reduce the temperature inside of a building compared to darker colours. This is especially important to consider in conjunction with building materials, as some materials can store and re-radiate significantly more heat if they are darker coloured

2.14 External design principles should also consider negative effects; larger windows for example can provide maximum solar gain in the winter months, but cause issues such as overheating in summer months.[(3)]

2.15 **Internal layout** – The layout of habitable rooms can be carefully orientated in relation to the path of the sun, so the rooms used most often can benefit from solar glare.

- Rooms that are most frequently occupied should benefit from a southerly aspect, but with appropriate measures to avoid overheating
- Rooms that contain heat generating appliances (i.e. kitchens, utility rooms, or rooms with high heat production in non-domestic buildings) or are less frequently occupied (i.e. bathrooms and cloakrooms) should be located in the cooler part of the building, which is generally the northern side.
- The size of interior rooms should be designed in conjunction with appropriately sized fenestration so rooms do not appear dark, such as considering the depth of the room compared to the size/orientation of windows
- Certain devices, such as solar tubes, can be used for darker, interior wall-locked rooms.

2.16 The key factors above should be considered at an early stage of the planning process, and evidence should be demonstrated regarding the consideration of these factors in any development proposals. Consideration of the above at an early stage can remove the need for active/mechanical cooling and reduce the demand for space heating.

2.17 The above factors can also reduce the demand for artificial lighting, however unwanted glare created by natural or artificial light can be uncomfortable for people both inside and outside of a building. Unwanted solar glare can be minimised if factors above are considered early in the design process, such as incorporating blinds and shutters during peak daylight.

3 https://www.bradpettitt.com/blog/effective-house-design-for-passive-heating-and-cooling/

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Passive Design and Layout

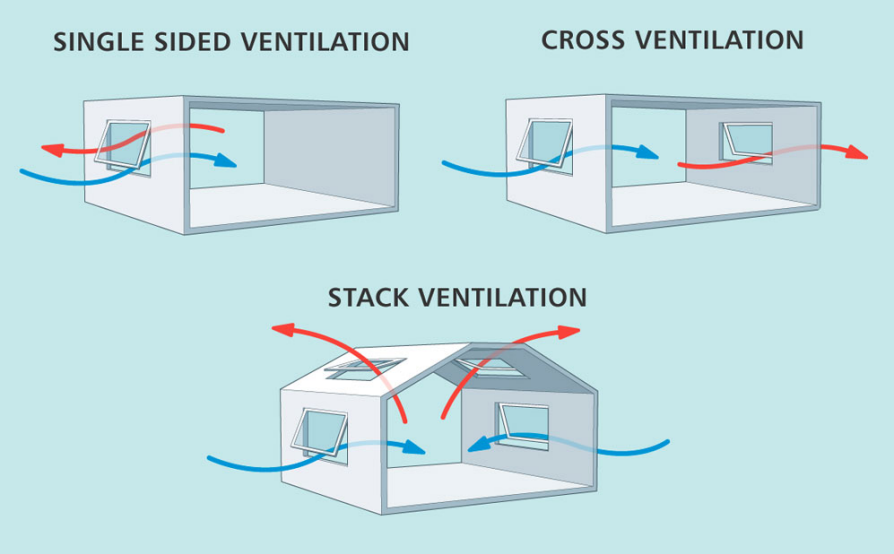
Passive Ventilation

2.18 Maximising natural ventilation is appropriate in most circumstances and reduces the demand for active ventilation systems, such as mechanical ventilation and air-conditioning. However, this should be done in a controlled manner to ensure the building is largely airtight to reduce energy demand for heating or cooling in extreme periods of weather. Passive ventilation can contribute in part or in total to the building's ventilation requirements by:

2.19 **Cross Ventilation** – cross ventilation works by pressure differences between one side of the building and the other, drawing air in and allowing fresh air to flow through, improving air quality and providing natural cooling. Windows and/or openings on opposing (or adjacent) walls can assist with ventilation by drawing air through a space. Roof mounted turbines or wind cowls can also draw air in through smaller openings in walls and/or floors.

2.20 **Passive Stack Ventilation** – passive stack ventilation works on the principle that warm air naturally rises. It draws in fresh air from the outside (via trickle vents or windows) which replaces moisture-laden or odorous air. Rising warm air is drawn through ducts out of the top of a building, aided by the pressure effects of wind passing over the roof of a building. In some circumstances, a heat exchanger can be placed where the air escapes to capture heat gain and reduce heat loss.

2.21 In more general terms, windows should be openable to allow for purge ventilation and should also consider noise and air pollution concerns. Single aspect homes should also be avoided, as this usually creates poor ventilation.



Passive Design and Layout

Sustainability Criteria - Passive Design and Layout

Objective	Criteria
Incorporating Passive Design into Development Proposals	Proposals **must**… • Conform to Building Regulations – Part F, Part L, Part O • Feature dual aspect dwellings (wherever feasible) • Have satisfactory levels of sunlight and daylight within buildings and open spaces, and garden areas in particular. Proposals **should**… • Adopt any of the following passive design elements, and demonstrate their inclusion in development proposals, to reduce the need for artificial lighting, heating and cooling: ◦ Site layout, design and relationship between buildings and adjacent uses to maximise the reduction of carbon emissions. ◦ Orientation of buildings and whether they have a single or dual aspect (or more) ◦ Incorporate elevation design, including materials choice, fenestration design, shading devices and eaves design to maximise passive design principles. ◦ Include planting and soft landscaping specifically aimed at positive passive design into development proposals, including green roofs, which can afford shade and stabilise microclimates. • Utilise the Hertfordshire Building Futures Sustainable Design Toolkit to inform design choices, focusing in particular on: ◦ How will energy demand for heating, lighting and cooling be avoided? Proposals **could**…

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Passive Design and Layout

	• Utilise passive solar gain, cooling, overheating and ventilation relative to the building's use and location, and demonstrate how the implementation of these principles have resulted in a reduction in energy consumption and carbon emissions.
	• Achieve Criteria 1 to 5 for BREEAM ENE 04 (non-domestic)
	• Achieve Passivhaus certification, specifically showing [4] (domestic):
	  ○ A signed PHPP showing calculations on shading, ventilation, SummVent, Summer (all matters relating to passive design)
	  ○ Required planning documents relating to passive design (see list in footnotes)
	  ○ Supporting documents relating to passive design (see list in footnotes)

4 See list stating Passivhaus certification criteria - https://passiv.de/downloads/03_certification_criteria_residential_en.pdf

Energy Efficiency and Carbon

Introduction

3.1 Buildings inherently consume energy through operational use, and the built environment is a significant contributor to overall UK energy consumption. According to the Climate Change Committee[(5)], buildings were responsible for 17% of direct greenhouse gas emissions[(6)] and responsible for 59% of UK electricity consumption in 2019.

3.2 Most recent data published by DESNZ indicates that, in Welwyn Hatfield, domestic energy is responsible for 24.7% of borough wide total Greenhouse Gas emissions[(7)].

3.3 Achieving high levels of energy efficiency for newly constructed buildings will reduce the operational energy consumption and will therefore have a crucial input on reducing the impacts of climate change, addressing the borough's climate emergency, and meeting the Government's target to reduce CO2 emissions to net zero by 2050.

3.4 The materials and technologies we choose are critical in providing energy efficiency, low carbon homes in terms of embodied and operational carbon emissions.

Energy Efficiency Policy and Guidance Context

	National	Local
Policy/ Legislation	National Planning Policy Framework – Meeting the challenge of climate change, flooding and coastal change. Building Regulations – Part L	Welwyn Hatfield Local Plan – Policy SP10, SADM13
Other Considerations	Embodied Carbon - Practical Guidance | UKGBC Embodied Carbon | UKGBC	Hertfordshire Climate Change and Sustainability Partnership: Strategic Action Plan for Carbon Hertfordshire Building Futures Sustainable Design Toolkit – Energy and Climate Change Technical Module

5 Sector-summary-Buildings.pdf (theccc.org.uk)
6 Direct meaning greenhouse gas emissions being produced directly from the building (not from the grid, for example)
7 BEIS 2022

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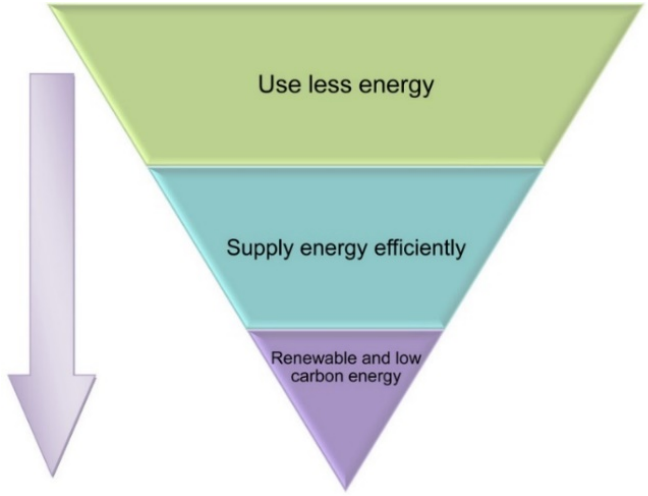
Energy Efficiency and Carbon

		Hertfordshire Climate Change and Sustainability Partnership: Retrofitting your Home Hertfordshire Development Quality Charter

Local Plan Requirements – Energy Efficiency

3.5 Policy SP10 states that proposals that adopt and demonstrate the following principles via a Sustainable Design Statement will be supported:

- The use of renewable and low carbon energy infrastructure is used where it is appropriate and consistent with other policies.
- Layout and design of the site and building(s) reflect the energy hierarchy to maximise opportunities to reduce carbon emissions (see figure).



3.6 All major development proposals must demonstrate that they have sought to maximise opportunities for renewable and low carbon sources of energy supply where consistent with other Local Plan policies.

3.7 Policy SADM13 requires all non-residential development over 1000 square metres to achieve a BREEAM ‘excellent’ rating.

3.8 The implementation for Policy SP10 gives further guidance on Policy SP10. The Building Futures Sustainable Design Toolkit and associated modules on matters of energy, climate change adaptation, water, materials and waste, landscape and biodiversity, noise and air should be used to inform the response to SP 10, SADM 13 and SADM 14 according to the scale and nature of development.

Energy Efficiency and Carbon

Other Policy Considerations

3.9 **Hertfordshire Climate Change and Sustainability Partnership: Strategic Action Plan for Carbon**[8]: Whilst this Action Plan focuses on net zero carbon across Hertfordshire, the element of energy efficiency is key to achieving this.

3.10 **The Building Futures Sustainable Design Toolkit**[9]**:** The Design Toolkit features a technical module on energy and asks applicants to answer the following questions:

- How will energy demand for heating, lighting and cooling be avoided?
- What energy efficiency solutions will be used to further reduce energy demand in the new development?
- Where relevant, how will renewable and low carbon energy technologies be integrated into the new development?

Objective: Reduce the amount of energy directly and indirectly consumed by domestic and non-domestic buildings

Considering Energy Consumption During the Whole Life Cycle of a Building

3.11 Operational energy consumption is seen as a focus for reducing energy in the built environment and is due to be a declining proportion of whole life cycle energy consumption and emissions due to proposed changes to Building Regulations. However, the whole life cycle [10] of a building needs further consideration especially as many aspects of a building's life cycle are directly unregulated.

3.12 Life Cycle Assessments (LCAs) or Whole Life-Cycle Carbon (WLC) assessments can calculate the total carbon emissions during the lifecycle of a building. These assessments typically consider the emissions produced at the stages listed below. There are nationally recognised assessments available which identify and help to reduce whole life-cycle carbon [11].

8 HCCSP Strategic Action Plan for Water 2023
9 Sustainable Design Toolkit (hertfordshire.gov.uk)
10 Carbon Leadership Forum - Life Cycle Assessment of Buildings (LCA): A Practice Guide
11 Whole life carbon assessment (WLCA) for the built environment (rics.org)

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Energy Efficiency and Carbon

Production

3.13 The production stage of a building includes the extraction of raw materials (or processing of recycled materials), transportation of materials to and from the production facility, and the manufacturing of products from these raw or recycled materials, which should all be considered at the initial stages of the development process. Linking to the 'beyond the lifecycle' stage, secondary and recycled materials can be used here to reduce embodied energy and encourage a circular economy. This includes utilising materials already on-site from existing buildings e.g. demolition of existing buildings.

Construction

3.14 The construction stage of a building includes the transportation of products from factories to the construction site, and operating equipment (including facilities used by construction professionals), which should all be considered at the initial stages of the development process.

In Use

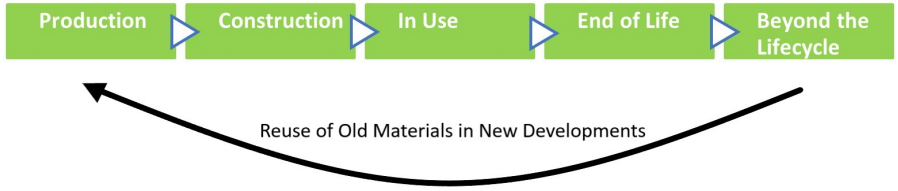
3.15 The vast amount of energy consumed during this phase is the operational energy used by the building. However, the ease of maintenance, repair, replacement and refurbishment of these buildings should be considered. The materials used should also be considered in terms of their durability and energy impacts associated with their production and construction.

End of Life

3.16 The end-of-life stage of a building includes the 'de-construction' of a building, which relates to the demolition/dismantling, transportation of materials to their end-of-life state, waste processing and disposal of materials, which should all be considered post and prior to development.

Beyond the Lifecycle

3.17 'Beyond the lifecycle' considers the energy and associated carbon saved from material re-use. If a building utilises recyclable and reusable materials in the previous four stages, these materials can then be used for a future development.



Building an Energy Efficient Building Envelope

3.18 A poorly insulated property can waste as much as one third of energy through heat loss. Therefore, having a high thermal performance is imperative to improving energy efficiency. High thermal performance is attributed to the rate of heat transfer, meaning the lower the heat transfer, the better the building performs.

Energy Efficiency and Carbon

Insulating the Building Envelope

3.19 Increasing thermal performance through increased insulation of the building envelope is the most widely recognised way to reduce heat loss. In the built environment, the heat transmittance of the building's fabric is often calculated using a **U-value**, which is the thermal transmittance coefficient. The smaller the U-value, the better the element is at resisting heat transfer. U-values can be calculated for most elements of the building fabric, including walls, floors, roofs, windows and doors. Improving the U-values of these components is an essential part of reducing energy demand and consumption during operational use of residential and commercial buildings.

Improving Airtightness

3.20 Another element of thermal performance is airtightness. Heat in buildings is often lost via unwanted air leakage due to gaps or discontinuities in one or more elements in the building fabric. These issues can be reduced by:

- Constructing buildings with a continuous air barrier
- Sealing joints between floors/ceilings and walls, and between windows and doors
- Sealing gaps for services, pipes and wires
- Controlling ventilation systems in bathrooms, kitchens and other mechanical ventilation systems – some mechanical ventilation systems can also have heat recovery (MVHR), which recovers heat that would normally be lost as well as removing contaminants, smells and CO2.

3.21 However, whilst it is important to reduce air increase airtightness to reduce heat loss from unwanted background ventilation, it is important to consider that a high airtightness without considering background ventilation may lead to excessive moisture and pollutant build-up, which can cause poor indoor air quality and affect human health. It is very rare to attain ventilation standards through natural ventilation alone, especially for homes that are looking to achieve significantly better airtightness. Therefore, there may be a need to go beyond minimum standards for air quality purposes, which will almost certainly require some form of mechanical ventilation [(12)].

Reducing Thermal Bridges

3.22 A thermal bridge is an area or component of the building fabric which conducts heat more than the surrounding materials. The diagram below shows heat transfer through a thermal bridge. Thermal bridges often occur at junctions between components and/or services, such as windows, doors, balconies and lift shafts, particularly in commercial buildings. In some cases, thermal bridges can account for between 20% and 30% of a building's heat loss[(13)]. Thermal bridges can be minimised by:

12 Ventilation and Indoor Air Quality in New Homes
13 Thermal Bridging Guide (labc.co.uk)

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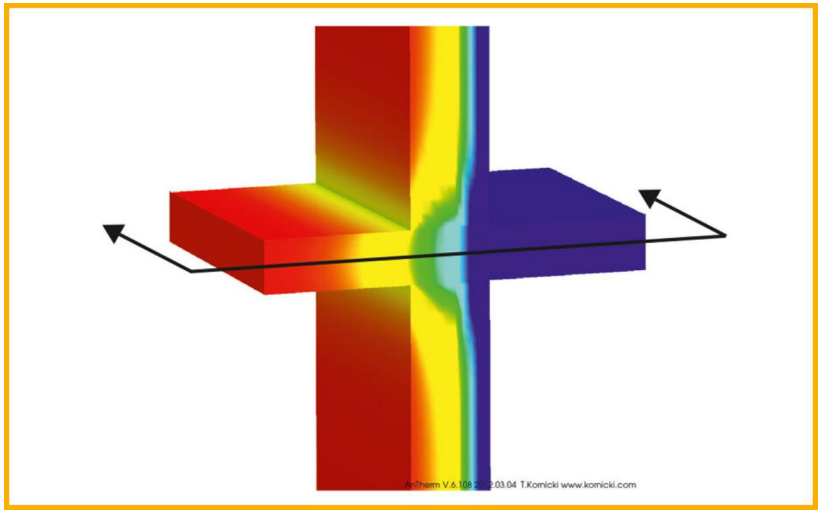
Energy Efficiency and Carbon

- Continuous insulation (this can be in conjunction with a continuous air barrier)
- Tightly wrapping insulation from wall cavity to rafter spaces
- Tightly fitting insulation with overlapping junctions and taped at joints/junctions
- Sealing and fitting window frames against high performing insulation
- Adding thermal breaks between known thermal bridges



3.23 Part L (volume 1 and 2) of the Building Regulations state that the building fabric should be constructed so there are no reasonably avoidable thermal bridges. Building regulations require that thermal bridging is considered within Standard Assessment Procedures and Simplified Building Energy Model, which are used to inform an Energy Performance Certificate. However, it is important to note that whilst EPCs are a commonly used rating system for efficiency, there are other standards and rating systems that can be used in tandem with EPCs, which can often be more stringent.

Incorporating Renewable Energy and Low Carbon Measures

Renewable Energy Production

3.24 The use of renewable energy production on-site is applicable for both residential and commercial, and can also be mass produced (solar farming, for example). There are different forms of renewable energy, which can be utilised to produce electrical energy or thermal energy. The most common forms of renewable energy utilised in, on or around buildings are:

- **Solar Photovoltaic** – photovoltaic cells convert the sun's energy directly into electricity. This energy can then be converted from DC to AC, which can be used to help meet the building's electrical power demands. The greater the intensity of light, the more energy is produced. In the event of an energy production surplus, this energy can be sold to the local utility provider (if certain conditions are met).
- **Solar Thermal** – Solar thermal (or solar hot water) panels harness energy from the sun to generate thermal energy directly into water, which can then be used to help meet the building's demand for hot water

Energy Efficiency and Carbon

or space heating. There are two types of solar thermal panels, which are flat plate collectors and evacuated tubes. Each have individual benefits and drawbacks – for example, evacuated tubes can be placed on flat roofs and are more efficient but are typically more expensive.

- **Solar Photovoltaic-Thermal (PV-T)** – PV-T panels generate both electrical and thermal energy. These panels utilise photovoltaic panels overheating by drawing heat away from the panel to produce hot water for hot water or space heating, which in turn makes the photovoltaic element of the panel more efficient.
- **Wind** – Wind turns blades which drive a turbine to produce electricity. Typically, if the wind speed is high, the more electricity is produced. Micro turbines can often be attached to the side or roof of buildings or put as standalone structures. Whilst they can be efficient ways to produce electricity, attaching turbines to buildings in urban areas is often unsuitable, or produce little electricity if surrounded by buildings (due to limited wind). Wind speed should be monitored over a prolonged period of time to test whether energy production via wind is viable.

3.25 Whilst these technologies can be utilised for residential or commercial buildings for renewable energy generation, proposals that utilise renewable energy technologies should consider aspect, tilt, shadowing and prevailing wind to maximise efficiency and potential energy generation. The use of renewable energy in conjunction with low carbon energy measures and/or energy efficient appliances, as listed below, has the potential to produce low carbon or net zero buildings.

Low Carbon Heat Generation and Energy Storage

3.26 In 2022, around two-thirds of non-domestic buildings utilised natural gas as the main heating fuel[(14)] whilst in 2023, 78% of homes used a type of gas central heating[(15)]. Whilst the transition from gas non-condensing boilers to gas condensing boilers has improved heating efficiency in residential and commercial buildings, they are still a major contributor to energy consumption and emissions produced on-site.

3.27 Many low carbon technologies utilise electrical energy instead of relying on gas or utilise burning fuel which is carbon neutral. Technology utilising electrical energy can be powered using renewable sources resulting in ultra-low carbon emissions or net zero. Examples of heat generation are:

- **Heat Pumps** – Heat pumps are powered by electrical energy and extract heat from a 'source', upgrades the heat and transfers it to a 'sink'. The source can come from air, ground or water, and the sink is typically the

14 Evidence update of low carbon heating and cooling in non-domestic buildings (publishing.service.gov.uk)
15 Boiler Statistics & Trends (UK & Beyond) | Heatable

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Energy Efficiency and Carbon

building's space heating and/or hot water systems. Heat pumps cannot produce high heat as well as gas condensing boilers as the fuel intensity of electricity is much greater than gas. Therefore, they are typically suited to systems which do not require as much heat, such as space heating, and buildings which are well-insulated or do not have access to mains gas. Using heat pumps to produce hot water and space heating in poorly insulated buildings often results in increased net carbon emissions compared to gas condensing boilers.

- **Air source heat pumps** extract heat from the air, even when temperatures are low. They only require a small amount of outside space and are typically less expensive to install, however they are less efficient in winter when demand for space heating increases.
- **Ground source heat pumps** extract heat from the 'base heat' of soil. They are typically more consistent regarding their efficiency as soil temperatures stays more constant than air temperatures, and they are less visually imposing. However, they require a lot of space underground and they can often be more expensive (unless landscaping is already taking place). They are also good in clay soil areas but unsuitable in chalk.
- **Water source heat pumps** work similarly to ground source pumps, but use water as a medium rather than soil. They can either extract heat by lifting water to the surface directly from the body of water (open loop), or can extract heat from the water by pumping fluid through a submerged conducting pipe (closed loop). The body of water is often a solar pond which maximises solar gain, therefore increasing heat pump efficiencies, but can utilise lakes, rivers and aquifers. As they require a large body of water, they are only suitable if located nearby to a body of water or if there is enough required space.

3.28 **Biomass Boilers** – a biomass boiler works similarly to a conventional gas boiler; it burns fuel to produce thermal energy for space heating and/or hot water. However, instead of using gas for fuel, biomass boilers use wood logs, chips or pellets for fuel. Although the burning of biomass boiler fuel emits carbon dioxide, the amount of carbon dioxide absorbed by the plant before being harvested often provides carbon offsetting, especially if replacement plants are planted at the time of harvest. Whilst processing and transportation mean the fuel is not entirely carbon neutral, it emits less carbon dioxide than conventional gas boilers when considering the initial carbon offset. However, as they operate by burning biomass, there needs to be consideration toward the production of particulate matter and therefore are generally unsuitable for urban areas. Also, as they produce CO2 emissions, they are typically not as sustainable as heat pumps and should not be prioritised above heat pumps for many applications.

3.29 **Combined Heat and Power Plants (CHP)** – A CHP plant is a form of decentralised energy production, which burns fuel to produce electricity and utilises waste thermal energy

to provide space heating and/or hot water. The electrical energy produced is significantly more efficient than from the grid (75% efficiency compared to 40%) due to associated losses via transmission and waste heat. Typically, they run on natural gas which emits carbon dioxide, but they can reduce emissions compared to individual gas boilers if designed well. They can also utilise biomass boilers, however this technology is less mature. There are two types of CHP:

- Micro CHP – These are typically for small, single domestic and non-domestic uses with high heating demand, as they produce more heat than electrical energy.
- Macro CHP – used for large non-domestic single uses or large residential-led mixed use developments. As they provide energy on a significantly larger scale, they require a lot of space and sometimes have a bespoke building. However, as they are able to provide energy in mass, they can supply energy to buildings without the need for individual boilers. They are especially effective if individual buildings utilise renewable electrical energy sources, resulting in some developments being completely off-grid.

3.30 **Underfloor Heating** – Underfloor heating is more energy efficient than radiators because it runs at a lower temperature, and it can give higher levels of thermal comfort as it covers the whole room rather than one area (compared to conventional radiators). Although it runs at lower temperatures, it can achieve comparable levels of warmth and comfort. Energy efficiency further increases if using in conjunction with heat pumps (for water underfloor heating systems) or photovoltaic panels (for electric underfloor heating systems).

3.31 **Battery Storage** - Buildings that utilise on-site energy generation, such as photovoltaic panels and wind turbines, may also utilise battery energy storage systems (BESSs) to store electricity at times when supply is higher than demand. This is especially pertinent for PV panels during summer months, where electricity generation during days with many hours of daylight is often surplus to the energy consumed during the day due to less demand for lighting, heating, etc. This can also reduce pressures on grid energy demand.

Installing Energy Efficient Fixtures and Fittings

3.32 To further reduce the amount of energy consumption in residential and commercial contexts, energy efficient fixtures and fittings, such as appliances and lighting, can be incorporated into the construction of buildings.

3.33 **Low Energy Lighting** - Light Emitting Diode (LED) and Compact Fluorescent Lamp (CFL) lightbulbs are significantly more efficient than traditional lightbulbs and do not reduce the quality of light in buildings. They

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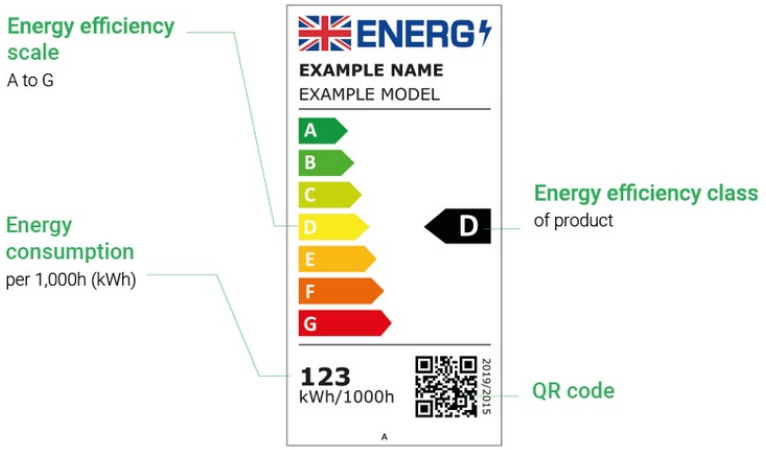
Energy Efficiency and Carbon

consume up to 90% less electricity than equivalent traditional bulbs[16] and last longer before replacement is required.

3.34 Hot Water Consumption and Production - Whilst reducing water flow is linked to water efficiency, reducing the flow for water outlets that consume hot water reduces energy consumption from heating. Also, utilising immersion heaters and hot water tanks that have a better energy rating can save money as well as reducing energy consumption. New technologies that can take advantage of wastewater heat can also improve energy efficiency by recovering energy from already heated water.

3.35 Appliances and Equipment - The collective energy consumption from appliances and consumer electronics in a residential context can be as high as 35% of the building's overall energy consumption[17]. Commercial contexts vary due to the operational use, however the energy consumption from appliances and equipment is often a significant factor in overall energy consumption. Commercial contexts vary due to the operational use, however the energy consumption from appliances and equipment is often a significant factor in overall energy consumption.



3.36 When considering which appliances, equipment and electronics should be installed in new buildings, consideration should be made toward their energy efficiency rating. The majority of new appliances, equipment and electronics state their energy consumption in KWh, or feature an energy label which gives them a rating on a scale of A to G, with A being most efficient and G being least efficient (see figure below).

3.37 For new buildings, consideration should be given to the energy efficiency of installed appliances, equipment and electronics. Consideration should also be given to the size and proposed use of appliances, equipment and electronics, as installing larger items than necessary will use more energy than is required.

16 How-much-do-my-appliances-cost-to-use-October-2022.pdf (nea.org.uk)
17 How Much Energy/Electricity Do My Appliances Use? | Heatable

Energy Efficiency and Carbon

Considering Retrofit over Rebuild

3.38 In many cases, the retrofitting and reuse of existing buildings as opposed to demolition and rebuild is more environmentally sustainable. Whilst the operational carbon emissions of a new building is typically less compared to an older building (due to more advanced construction techniques), retrofitting existing buildings can often bring their energy efficiency and environmental performance to new-build levels of energy efficiency and, in some cases, greatly exceed building regulation levels of energy efficiency and airtightness.

3.39 Depending on the age of a building, the environmental performance of an existing building compared to new-build can be drastically poorer. The environmental performance of an existing building is often proportionate to its age; for example, a Victorian property often produces double the carbon emissions of a post-1990 property, and this can be even higher when comparing against new build properties.

3.40 There is also the element of Whole Life-Cycle Carbon (WLC) emissions to consider. Utilising existing materials of a building reduces embodied carbon through less new materials being produced and old materials being reused. The embodied carbon associated with a new building is on average twice that of a deep retrofit, so significant emissions can be saved by retrofitting over rebuilding.

Assessment of an Existing Building

3.41 Before starting any type of retrofit on a property, it is important to assess a building's current environmental performance. In the UK, domestic properties are typically assessed against the Standard Assessment Procedure (SAP) or Reduced Standard Assessment Procedure (RdSAP) and non-domestic properties are assessed against the Simplified Building Energy Model (SBEM).

3.42 This assessment produces an Energy Performance Certificate (EPC) for domestic properties and a Commercial Energy Performance Certificate (CEPC)/Display Energy Certificate (DEC) for non-domestic properties. These advise the energy performance of a property, the cost of heating and lighting, its estimated carbon emissions and provides details of how to improve the energy performance of a property. Domestic properties are ranked from A to G (A being highest performance), and non-domestic properties are ranked from A+ to G (A+ being highest performance). Whilst an EPC is only required when selling, letting or building a new building, they can be obtained at any time for a fee and provide insight into the environmental performance of a building and how to further improve energy efficiency.

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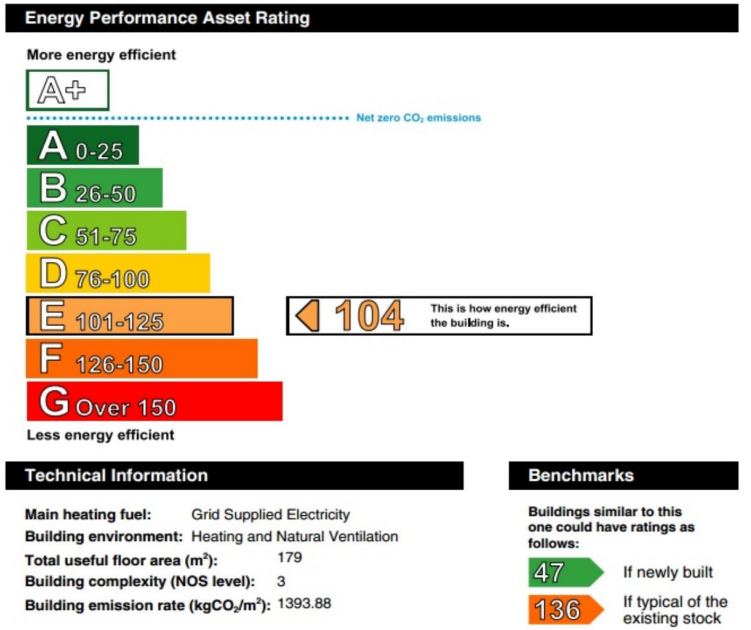
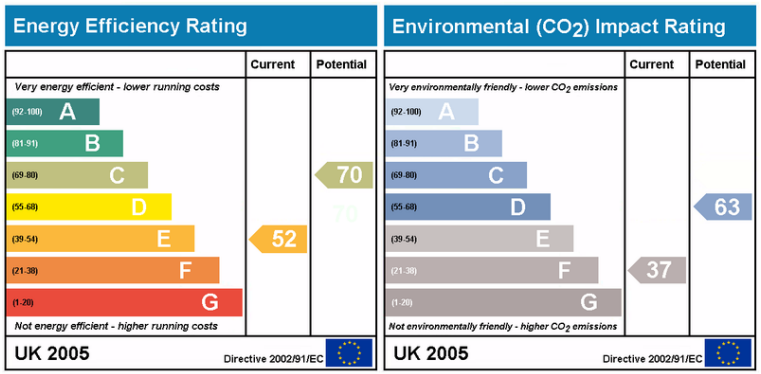
Energy Efficiency and Carbon





Retrofitting Projects

3.43 Retrofitting projects vary greatly in scope and involvement. This is referred to as the 'level' of retrofit, with 'deep' retrofit involving an in-depth renovation aimed at significantly reducing energy consumption. However, a retrofit project can involve any level of renovation aimed at reducing energy consumption. Retrofit solutions include improvements:

- Building fabric – This includes improving walls, roofs, floors, windows, external doors, airtightness of the building envelope and thermal breaks. This is often where the biggest improvement regarding energy consumption can be made. In line with the energy hierarchy and best practice, a 'fabric first' approach is preferred before applying other retrofit solutions, as this will make low carbon heat generation units operate significantly more efficiently. Historic buildings may benefit more from improving the building fabric due to the technologies used at the time of construction, however this should be done sympathetically to the building's historic value.
- Renewable energy production – different types of renewables can be retrofitted to many existing properties to reduce energy consumption from external sources.
- Low carbon heat generation – older properties are more likely to utilise older fossil fuel boilers, which have poor efficiency. Heat pumps, CHP and biomass boilers can be installed to further reduce energy

consumption, and often work well in tandem with renewable energy production.

- Energy efficient lighting – LED and CFL are significantly more efficient than traditional lightbulbs and are a cost effective solution.

3.44 There are several different publicly accessible specifications and standards that can be followed/achieved:

- PAS2030 – A publicly available installer scheme for demonstrating compliance with requirements for installing energy-efficiency measures
- PAS2035 – A publicly available specification for whole-house retrofit, detailing the assessment, co-ordination, design and installation of retrofit principles and measures.
- PAS2038 – A publicly available specification for retrofitting non-domestic buildings (typically less than 500sqm in size), setting out requirements and information for funding, assessment, specification, design and installation of building improvement measures
- PAS2080 – A publicly available standard for managing carbon in infrastructure
- EnerPHit (domestic) – A Passivhaus refurbishment standard which specifies performance criteria in order to receive EnerPHit certification.
- AECB CarbonLite Retrofit – A retrofit standard which specifies performance criteria to meet AECB CarbonLite Standards
- AECB CarbonLite Retrofit step-by-step – A similar standard to above, but aims to do retrofit in steps rather than adopting a full retrofit standard and does not state a specific criteria.
- Energiesprong – A performance specification standard for existing homes

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Energy Efficiency and Carbon

Sustainability Criteria - Energy Efficiency

Objective	Criteria

Considering Energy Consumption During the Whole Life Cycle of a Building	Proposals **should**…
	• Consider the Whole Life-Cycle Carbon Impact of development proposals
	Proposals **could**…
	• Submit a RICS Whole Life-Cycle Carbon Assessment
	• Achieve a WLC benchmark scores as follows:
	  ○ A1-A5 - <750
	  ○ B-C (excluding B6 and B7) - <370
	  ○ A-C (excluding B6 and B7) - <1000

Building an Energy Efficient Building Envelope	Proposals **must**… • Have U-values conforming to Building Regulations specified for walls, floors, roofs, windows and doors • Have air permeability performance conforming to Building Regulations • Have Y-values conforming to Building Regulations specified for thermal bridges Proposals **should**… • Consider layout and design of site to maximise opportunities to reduce carbon emissions (see chapter on Passive Design) Proposals **could**…

Energy Efficiency and Carbon

Objective	Criteria
	• Ensure that developers identify a sustainability standard that exceeds minimum current building regulations as part of their planning application and then use an industry-recognised process to demonstrate compliance with that standard upon completion of their development • Achieve U-values for wall, roof and floor elements of between 0.1 and 0.15 (Passivhaus rule of thumb) • Have air permeability performance no greater than 0.6m^3/h @50pa • Be thermal bridge free where possible, or minimise all unavoidable thermal bridges
Incorporating Renewable Energy and Low Carbon Measures	Proposals **must**… • Have at least 92% efficiency for gas boilers providing wet heating (e.g. radiators) • Have at least 91% efficiency for regular oil boilers/86% efficiency for combi oil boilers providing wet heating Proposals **should**… • Consider the use of renewable and low carbon energy in line with energy hierarchy Proposals **could**… • Require mechanical ventilation with heat recovery • Require low carbon heat generation (see examples listed above) • Require on-site renewable energy generation • Require on-site battery energy storage
Energy Efficient Fixtures and Fittings	Proposals **must**… • Have minimum efficacy of all fixed lighting within Building Regulations Proposals **should**… • Have energy efficient lighting in all light sources, unless demonstrated this is not technically feasible

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Energy Efficiency and Carbon

Objective	Criteria
	Proposals **could**… • Have minimum A-rated energy efficiency for all appliances installed before operational use
Considering Retrofit over Rebuild	Proposals **must**… • Conform to Building Regulations for any modifications/extensions to an existing property Proposals **should**… • Adopt a 'fabric first' approach if planning to make energy efficiency improvements to an existing property Proposals **could**… • Retrofit an existing building rather than demolishing and rebuilding • Utilise an existing standard/specification for the retrofit of an existing building and achieve accreditation
General	Proposals **must**… • Achieve a BREEAM 'excellent' rating for all non-residential development over 1000 square metres Proposals **could**… • Have 15kWh per square metre space heating net energy consumption per year or lower (domestic) • Assess the predicted baseline energy demand and emissions for the site, including site-wide heating, cooling, ventilation, and electricity from all site uses including street lighting • Ensure a building user guide is provided to allow occupants to fully understand how the building works and utilise its energy most efficiently • Achieve a minimum of 16 BREEAM credits from the Energy category (non-residential)

Water Use and Efficiency

Introduction

4.1 Water is a precious resource and supplies are becoming scarcer across England, but the East of England has been classified by the Environment Agency as seriously water stressed[(18)]. An increasing population, combined with climate change producing hotter, longer and drier summers, is likely to exacerbate the scarcity of water and put increasing pressure on water availability. The East of England particularly suffers as it relies on aquifers for groundwater, which also service the unique chalk streams in the area. This has already had a negative effect on the River Mimram and the habitation of aquatic life[(19)].

4.2 It is estimated that there are 200 chalk streams in the world, 10% of which are in Hertfordshire. This means we are custodians of a very rare and valuable natural resource. Unfortunately, these chalk streams are in critical danger due to climate change, pollution and over abstraction.

Water Use/Efficiency Policy and Guidance Context

	National	Local
Policy/ Legislation	Building Regulations – Part G	Welwyn Hatfield Local Plan – Policy SP10, SADM13
Other Considerations		Hertfordshire Climate Change and Sustainability Partnership: Strategic Action Plan for Water Hertfordshire Building Futures Sustainable Design Toolkit – Water Technical Module

Local Plan Requirements – Water

4.3 Policy SADM 13 requires a consumption of 110 litres per person per day water consumption limit for newly constructed dwellings, and also requires a BREEAM 'excellent' rating for all non-residential development over 1000 square metres.

18 Water stressed areas – 2021 classification - GOV.UK (www.gov.uk)
19 Water Neutrality UK | Water Stress UK | Water Offsets

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Water Use and Efficiency

Other Policy Considerations

4.4 **Hertfordshire Climate Change and Sustainability Partnership: Strategic Action Plan for Water[20]:** a vision to facilitate the sustainable management of water in Hertfordshire, and seeks actions to reduce the risk of surface water flooding, increase water use efficiency to improve flow in water courses, raise awareness about the value of and issues surrounding water, and promote behaviour change in residents.

4.5 **The Building Futures Sustainable Design Toolkit[21]:** a tool to aid decision making on sustainable design at concept, pre-application and application stages for development in Hertfordshire. The Design Toolkit features technical modules on various topics relating to sustainability, including water. At the time of writing, the technical module on water has not yet been released.

Objective: Reduce the amount of net water consumed in the construction and use of residential and commercial buildings

Reducing water consumption

Construction

4.6 The construction of new buildings can be water intensive and measures can be implemented to reduce water consumption. Such measures include:

- A management plan which considers where water is used and can be reduced. This can be submitted as part of a planning application to accurately predict water use.
- Low flow sinks, toilets and showers in site cabins.
- Automatic shut off taps for washing tools/vehicles, or waterless technologies.
- Water recycling.

In use

4.7 New and/or existing development can include measures to reduce overall water consumption through day-to-day use. Such measures include[22]:

20 HCCSP Strategic Action Plan for Water 2023
21 Sustainable Design Toolkit (hertfordshire.gov.uk)
22 developing_water_efficient_homes.pdf (watersafe.org.uk)

Water Use and Efficiency

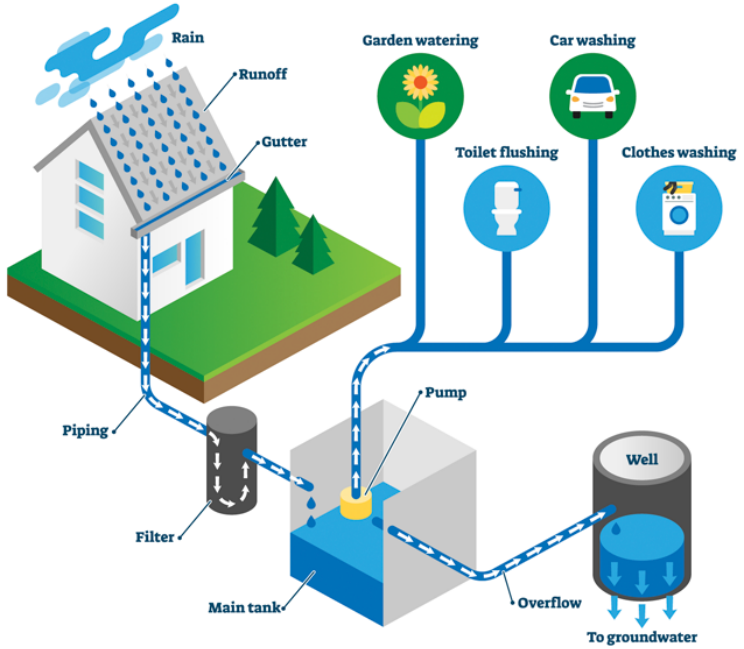
- Aerated washbasin/kitchen taps and shower heads
- Tapered/low capacity baths.
- White goods and appliances with low water consumption
    - Household goods will soon be sold with new water efficiency labels, allowing consumers and developers to identify the level of water consumption for appliances[23]
- Low flow baths, showers, sinks and toilets
- Individual system monitoring

4.8 More cost-effective solutions for retrofitting water consumption reducing devices are also available. Affinity Water offer free water saving devices to all residential homes in Welwyn Hatfield, which can be applied for here; Water Saving Devices (affinitywater.co.uk).

Incorporating Rainwater Harvesting

4.9 Rainwater harvesting is an efficient way to use water and involves the collection of rainwater directly from where it falls on. Rainwater harvesting can also reduce the strain on storm water or combined sewers by collecting water otherwise destined to be collected in sewers.

4.10 The predicted temperature increases will also lead to the air being able to contain more water, leading to heavier and/or prolonged periods of rain. Because of this, rainwater harvesting will also be able to take advantage of heavier rainfall.



4.11 For residential and commercial buildings, this can be collected from roofs and other above ground surfaces and collected via a system of pipes and tanks. This water can then be used for non-potable purposes, such as watering gardens, washing cars and flushing toilets, which reduces

23 Policy win: household goods to carry water efficiency labels | Policy Connect

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Water Use and Efficiency

the amount of water consumed from the mains supply. Larger tanks can also be installed on down pipes which treat water before use. In a residential and commercial context, water can be stored using water butts and are typically placed above ground at the bottom of gutter pipes leading from buildings, outbuildings, sheds, etc. Rainwater harvesting can also be delivered through the use of SuDS, such as SuDS planters, which can have additional benefits outside of reduced water consumption such as biodiversity and reduced flood risk.

Incorporating Greywater Re-use

4.12 Greywater is water that has previously been utilised and consumed for use by another purpose and then recycled for another use. This typically includes water that is recycled from bathrooms, cloakrooms and kitchens, and produces non-potable water which can then be used for watering gardens, washing cars, flushing toilets, etc.

4.13 Wastewater is collected from appliances and fed into a collection unit (via pumps or gravity) and treated and filtered to remove contaminants, bacteria and viruses. This water can then be stored before being pumped out for re-use.

4.14 Whilst this can be used as a great way of reducing water consumed from the mains supply, the complexity of this technology means it is difficult to retrofit to existing buildings and should be designed as a building specification prior to the construction of a building.

Water Use and Efficiency

Sustainability Criteria - Water Use and Efficiency

Objective	Criteria
Reducing Water Consumption	Proposals **must**… • Have a water consumption not exceeding 110 litres per person per day (domestic) Proposals **should**… • Require a management plan during construction identifying water use and measures to reduce net water consumption. • Have home Quality Mark (HQM) optional fittings standard for all water fittings/appliances (residential) Proposals **could**… • Net potable water consumption of 80 litres per person per day or less (domestic) • Have home Quality Mark (HQM) advanced fittings standard for all water fittings/appliances (domestic) • Achieve BREEAM Performance Level 5 for all components listed in water consumption performance levels (except for greywater and rainwater system) (non-domestic) • Achieve 5 or more credits in BREEAM Wat01 (non-domestic)
Rainwater Harvesting	Proposals **must**… • Ensure that any rainwater harvesting system complies with British Standards Proposals **should**… • Require any form of rainwater harvesting. Proposals **could**…

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Water Use and Efficiency

	• Have at least 50% of demand for non-potable water (e.g. WC flushing) met by rainwater/greywater
Greywater Re-use	Proposals **must**… • Ensure that any greywater system complies with British Standards Proposals **should**… • Require any form of greywater re-use. Proposals **could**… • Have at least 50% of demand for non-potable water (e.g. WC flushing) met by rainwater/greywater
General	Proposals **must**… • Meet at least BREEAM 'excellent' rating for all non-residential development over 1000 square metres, unless it is demonstrated that this is not technically feasible or viable. Proposals **could**… • Achieve a minimum of 15 credits in the Water Efficiency section in the Home Quality Mark (domestic) • A minimum of 9 BREEAM credits from the Water category (non-domestic)

Drainage and Flooding

Introduction

5.1 Climate Change is likely to lead to warmer and wetter winters and more intense storms in the summer and throughout the year in the UK, and increase the likelihood of flooding in certain locations. Hertfordshire saw severe storms in July 2024, parts of Welwyn Garden City saw surface water flooding after heavy storms in 2015, and a number of properties were flooded in Hoddesdon in 2021 and in Hitchin in 2024. The frequency and impact of these incidents are expected to increase. Flood risk can be mitigated or managed at an early stage of the development process in a number of ways including good water management.

Drainage and Flooding Policy and Guidance Context

	National	Local
Policy/ Legislation	National Planning Policy Framework (NPPF) – Chapter 14 – Meeting the challenge of climate change, flooding and coastal change Planning Policy Guidance – Flood Risk and Coastal Change	Welwyn Hatfield Local Plan – Policy SADM14
Other Considerations	Environment Agency technical guidance relating to groundwater protection, SuDS design and any other necessary technical design matters.	Hertfordshire County Council, Local Flood Risk Management Strategy 2019-2029

Local Plan Requirements – Flood Risk

5.2 **Policy SADM14** – Flood Risk and Surface Water Management - requires that development proposals "in areas at risk of flooding from any source should be informed by and consistent with relevant national planning policy and guidance, local and regional strategies and plans, and the latest flood risk information available". This means that flood risk assessments should be prepared where necessary and design should protect watercourses and retain flood storage, and manage surface water runoff.

5.3 The policy further requires that Flood Risk Assessments "will be in line with national policy and guidance and prepared in accordance with the requirements and advice set out in the Council's Strategic Flood Risk Assessment". It also says that major developments or those in areas "identified as being at risk of surface water flooding will be required to manage surface water runoff and surface water flood risk via the use of Sustainable Drainage Systems".

5

Drainage and Flooding

Objective: To reduce the risk of flooding in new and existing developments and incorporate sustainable mitigation measures if required

5.4 **Flood Risk Assessment** - As noted above, national and local policy requires developments to use a sequential approach and direct development to areas at lowest risk of flooding, and to make sure that developments do not increase the risk of flooding elsewhere.

5.5 **Design** - Developments should identify the likely impact on surface water run off rates and volumes on their site and include measures to reduce or mitigate flood risk or to manage water on the site should be included within designs at the earliest opportunity. Design must avoid harm to existing water courses through impacts upon flow rate, increasing the likelihood of blockages etc. Similarly, proposals must avoid culverting watercourses. For sites with existing culverts, priority should be given to "daylighting" them. Any proposals to culvert a main river or ordinary watercourse should be discussed with the Environment or Lead Local Flood Authority, respectively. Any development within 8m of an existing watercourse should secure a Flood Risk Activity Permit from the Environment Agency.

5.6 **Floor Levels** – Hertfordshire County Council recommend that for all developments, Finished Floor Levels (FFL's) should be at least 300mm above all sources of flooding or 150mm above ground level, whichever is the greater.

5.7 **SuDS** – Traditionally development has often sought to remove water from the site as quickly as possible by channelling it away for example through using pipes. This can contribute to flash flooding if a large volume of water reaches a watercourse in a short period of time and places additional pressure on receiving systems. Sustainable Drainage Systems (SuDS) seek to replicate more natural draining methods by retaining water on the site for longer and releasing it over a period of time at a restricted rate.

5.8 This reduces the rate and volume of water going into watercourses, drains and sewers, and can help improve biodiversity and amenity. A range of systems and techniques are available, which means that almost all developments can take advantage of them including non-major schemes. The NPPF says that major developments should incorporate sustainable drainage systems unless there is clear evidence that they are inappropriate, and Local Plan Policy SADM14 provides further guidance on their application, including that they should be included in the design of development proposals at the earliest opportunity.

Drainage and Flooding

5.9 **Drainage Hierarchy** - Applicants are encouraged to give detailed consideration to surface water run off rates and to restrict them to greenfield run off rates, and to manage run off as close to source as possible in line with the drainage hierarchy. The hierarchy is as follows:

i. Using rainwater as a resource, for example as rainwater harvesting
ii. Infiltration at or close to the source of the rainfall.
iii. Rainwater use in green infrastructure features, for example green roofs
iv. Discharge to a watercourse, unless this is inappropriate.
v. Controlled rainwater discharge to a surface water drain.
vi. Controlled rainwater discharge to a combined drain.

5.10 **Protection of water courses** - To protect any watercourses which receive surface or ground water, appropriate pollution prevention and treatment methods should be designed and installed in line with national standards.

5.11 **Integration of SuDS into placemaking** - Features such as high quality blue / green spaces, sustainable water management etc. can be integrated into public realm elements of the proposed development.

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Drainage and Flooding

Sustainability Criteria - Drainage and Flooding

Objective	Standard
Flood Risk Assessment	Proposals **must**... • Be consistent with relevant national planning policy such as the sequential test and guidance, local and regional strategies and plans, and the latest flood risk information available • Follow the sequential approach to development. If the sequential test is passed, the sequential approach should be followed which says areas at flood risk should not be developed. If that is not possible, then details of how existing flood risk will be safely mitigated should be provided • Prepare any flood risk assessments in accordance with the requirements and advice set out in the Council's Strategic Flood Risk Assessment. • Protect and enhance the flood risk management function of existing overland flow routes, watercourses and flood plains/storage areas to ensure there is no net loss of flood storage, flows are not impeded, and opportunities to make space for water are taken. • Maintain an appropriate development free corridor along watercourses and take opportunities to naturalise watercourses to improve their condition, ecological status, biodiversity and habitat connectivity. • Consider the fluvial flood risk presented by ordinary watercourses Proposals **should**... • Incorporate additional flood resilience measures such as raised Finished Floor Levels, to ensure the longevity of the site. (NOTE - The LLFA recommends 300mm above the local estimated flood level or at least 150mm above surrounding ground levels – the EA recommend 600mm) See: Preparing a flood risk assessment: standing advice - GOV.UK (www.gov.uk)

Drainage and Flooding

	The reason the LLFA recommend this is because they require all developments to be designed for a design storm defined by the EA. The relevant design storm is determined by the location of the site in the country, and the lifetime of the development. Residential sites tend to have a lifetime of 100 years but realistically many houses that we build today will still be there in hundreds of years. Therefore the LLFA asks all applications to include FFLs raised 300mm or ground levels raised at least 150mm just to keep these properties safe for longer. The LLFA do not yet actively encourage/require the EA's guidance for 600mm. • Actively seek to reduce flood risk in the vicinity of the site, to provide off-site benefits to local communities. Proposals **could**... • Contribute funding/S106 monies etc to local efforts to maintain or upgrade ordinary watercourses/ditches, etc.
Sustainable Urban Drainage Systems (SuDS)	Proposals **must**... • Be incorporated into the design of the proposal from the earliest stage. • Be designed in accordance with national standards and advice from relevant flood risk management bodies. This should include no flooding to occur on new sites up to and including the 1 in 30 year storm events, with no flooding to leave the site uncontrolled during the 1 in 100 year event. • Follow the SuDS hierarchy, giving priority to above-ground, open blue-green SuDS features before resorting to underground structures • Restrict discharge to the 1:1 or QBAR greenfield runoff rates, or as close as practicable • Protect water quality by including an appropriate number of treatment stages before discharge • Avoid infiltration discharges in groundwater Source Protection Zone 1 (most vulnerable) • Consider the discharge hierarchy (above) with priority given to rainwater harvesting/re-use before disposal • Adhere to requirements in Local Plan Policy SADM14 • Not discharge surface water to foul sewers. Proposals **should**...

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Drainage and Flooding

- Integrate the four pillars of SuDS (water quantity, quality, biodiversity and amenity)
- Be designed in accordance with the Non-statutory Technical Standards for SuDS (NSTS)
- Retain or install, wherever possible, permeable surfaces and avoid large areas of hard surfacing.
- Manage run off as close to the source as possible
- Distribute SuDS throughout the site to promote a source control approach instead of relying on oversized attenuation at the end of the system
- Use SuDS that are attractive and multifunctional.
- Retrofit SuDS onto existing brownfield sites

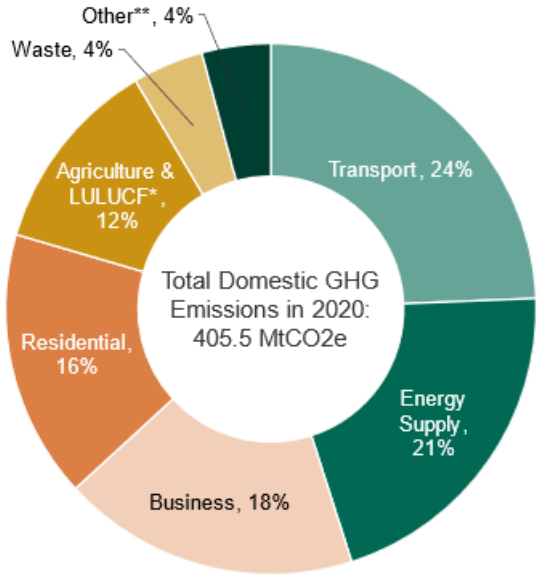
Proposals **could**...

- Install greenery, trees and green roofs wherever possible to aid absorbency.
- Retrofit SuDS into brownfield sites even for areas not being changed as part of redevelopment (e.g. Upgrade existing car parks to be permeable paving)

Active and Sustainable Travel

Introduction

6.1 Transport is a key contributor to the UK's carbon emissions. According to Government data, transport was responsible for 24% of total UK emissions in 2020. Of that figure, road transport was responsible for 91% of the total, and passenger cars and taxis 52% of that[(24)]. In Welwyn Hatfield, the proportion was even higher with transport being responsible for 36% of total emissions in 2022.



6.2 In addition, reduced levels of petrol or diesel vehicles will potentially have benefits in improved air quality. Whilst electric vehicles (EV's) will eventually replace petrol and diesel powered cars, there will continue to be significant numbers on the roads for some time, and simply replacing one fuel source with another will not reduce congestion nor other negative impacts associated with private motor vehicles, and EV's still have emissions of particulates.

6.3 There is a danger that new developments can be dominated by the private car. Poor design, accessibility and lack of provision or connectivity can make using means of travel other than the car more difficult than they need be. As the National Design Guide says: "In well-designed places, people should not need to rely on the car for everyday journeys, including getting to workplaces, shops, schools and other facilities, open spaces or the natural environment. Safe and direct routes with visible destinations or clear signposting encourage people to walk and cycle".

6.4 Poor design can lead residents of these developments into over reliance on the car and this habit can be a hard one to break once established. Developers should consider the needs of residents' travel at a very early stage and seek to make good quality facilities and links an integral part of the development.

6.5 By contrast, well designed places can reduce the need to travel, by providing a mix of uses and facilities, and locating uses close to one another, or enable more sustainable transport choices.

24 https://www.gov.uk/government/statistics/transport-and-environment-statistics-2022/transport-and-environment-statistics-2022

6

Active and Sustainable Travel

6.6 In addition, providing good quality infrastructure that is well connected to locations that residents wish to travel to will encourage reduced car usage and increase the rate of active travel. Installing this when development is underway will be easier and more cost effective than retrofitting it later, and will encourage occupants of new developments to use active and sustainable travel from an early stage.

Active and Sustainable Travel Policy and Guidance Context

	National	Local
Policy/ Legislation	• National Planning Policy Framework (NPPF) – Chapter 9 Promoting Sustainable Transport • Decarbonising Transport: A Better, Greener Britain	• Welwyn Hatfield Local Plan – Policy SP4, SADM3 • Hertfordshire County Council Local Transport Plan 4 (LTP4) • South Central Hertfordshire Growth and Transport Plan (GTP) (2022)
Other Considerations	• Gear Change: A Bold Vision for • Cycling and Walking (2020) • Local Transport Note LTN1/20 (2020)	• Welwyn Hatfield Local Cycling and • Walking Infrastructure Plan (LCWIP) (2023) • An Active Travel Strategy for Hertfordshire (2024) • Hatfield 2030 Transport Strategy (2018) • Hertfordshire Place and Movement Planning and Design Guide (2024) • Sport England Active Design Guidance (2023)

Local Plan Requirements – Transport

6.7 **Policy SP4** of the Welwyn Hatfield Local Plan says that "the Council will seek to support both planned growth and existing development with appropriate transport infrastructure, with the emphasis on promoting the use of sustainable modes of travel and improving safety for all

Active and Sustainable Travel

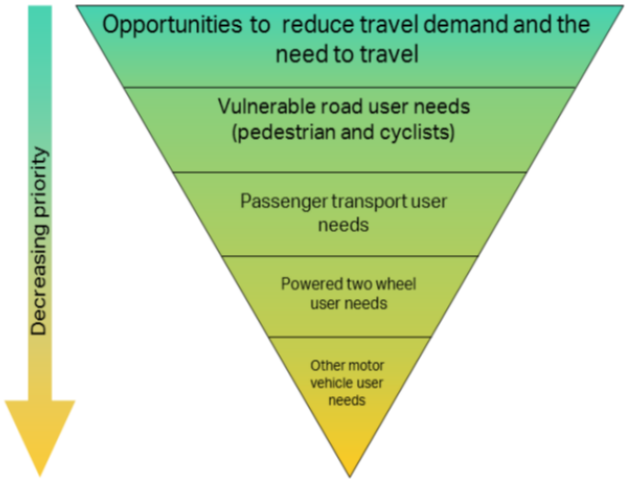
highway users". It also says that the Council will work with the County Council and others to design and fund transport infrastructure where necessary to support growth.

6.8 **Policy SADM3** requires developments to submit a travel plan as part of a planning application and to make provision where appropriate for cyclists, pedestrians, public transport and charging facilities for EV and hybrid vehicles.

Local Transport Plan 4 Requirements

6.9 Hertfordshire County Council's Local Transport Plan 4 (LTP4) covers the period 2018 to 2031. It sets out "how transport can help deliver a positive future vision of Hertfordshire" and "accelerates the transition from a previous transport strategy that was largely car based to a more balanced approach which caters for all forms of transport and seeks to encourage a switch from the private car to sustainable transport (e.g. walking, cycling and passenger transport) wherever possible". The Plan sets out a transport hierarchy which is shown below.

6.10 Policies 7 and 8 in the Plan seek to encourage and promote walking and cycling, but since the Plan was adopted, the emphasis on active travel has increased further and the replacement LTP5 is likely to place greater emphasis on active travel. The diagram below shows the Hertfordshire County Council Local Transport Plan 4 Transport Hierarchy.



Other Topic Specific Considerations

Local Cycling and Walking Infrastructure Plan (LCWIP)

6.11 The Welwyn Hatfield Local Cycling and Walking Infrastructure Plan (LCWIP) was adopted by Hertfordshire County Council in March 2023. These are part of the Government's strategy to increase walking and cycling and are a long term approach to improving infrastructure by identifying and prioritising improvements to the active travel network. The Welwyn Hatfield LCWIP focusses on Welwyn Garden City and Hatfield, and the immediately surrounding villages, and acts as an evidence base for future works and securing funding.

6

Active and Sustainable Travel

Active Travel England

6.12 Active Travel England (ATE) has been made a statutory consultee on all large-scale planning applications. From 1st June 2023, ATE will be consulted on developments equal to or exceeding 150 housing units, 7,500 square meters of floorspace, or an area of five hectares. The goal is to ensure that walking, wheeling, and cycling infrastructure is included in the design and implementation of new development.

Objective: Reduce the need to travel and enable active and sustainable travel

Transport Assessments

6.13 Proposed developments above a certain threshold will be required to provide a transport assessment. Details of the thresholds for different types of development are detailed on the Council's website.

6.14 This transport assessment will set out the impact of the development and will include all existing and proposed commercial and residential vehicular and pedestrian movements to and from the site. Loading areas and arrangements for manoeuvring, servicing and parking of vehicles should also be clearly identified. It should describe and analyse existing transport conditions, how the development would affect those conditions and any measures proposed to overcome any problems.

6.15 New developments will be expected to encourage cycling through the inclusion of safe cycle routes and parking for cycles. New routes should link to – and enhance where necessary - existing infrastructure to key local destinations to promote the widest uptake of active travel options. Contributions may be required for off-site facilities.

Reducing the Need to Travel

6.16 Developments can reduce the need to travel by providing facilities in close proximity to housing. Having schools, workplaces, shops, medical facilities, public green space and others which will be used by local residents in close proximity will reduce the need to travel. Often this will be easier to do in strategic developments where there is a significant scale of mixed use development, but developers of all should consider what is already in the wider area and may be made use of by new residents.

6.17 Measures to increase uptake of active and sustainable travel and reduce use of the private car could include:

6.18 **Design** – The design of developments should seek to promote active and sustainable modes of travel and prioritise these over private car use. By creating development layouts that prioritise pedestrian and cycle movements over the car, active travel is seen as a more attractive way of moving around. Promoting active travel can also be done by identifying locations for development that require shorter distances to points of interest, and/or

shorter distances to more significant active transport links such as high quality walking/cycling infrastructure, and bus and train stations.

6.19 **Pedestrian Links** – Good quality pedestrian links should be provided to every home and should enable all residents to easily and safely access facilities such as shops, schools etc. on foot without routes being interrupted.

6.20 Pavements should be of a high quality, well surfaced and should include an appropriate number of crossing places using either dropped kerbs or raised tables. Provision should be put in place to ensure that vehicles cannot be parked in such a way that these crossing points are blocked or that pavements are not parked on. These should also be appropriate and safe for all users including those with additional access or mobility needs.

6.21 **Cycle Links** – Good quality cycle links should be provided and enable all residents to cycle easily and safely to local facilities and those beyond the immediate development. This need not always be segregated provision where vehicle flows are low, but should be in line with Local Transport Advice Note LTN1/20. New homes should provide proper storage facilities for an appropriate number of bicycles which should be safe, secure and properly lit, including some provision for non-standard cycles such as cargo bikes, and commercial developments such as workplaces and retail units should provide proper cycle parking facilities.

6.22 **Public Transport** – Bus provision and priority should be implemented in all sites, and necessary roads should be configured to ensure that buses can access and manoeuvre around the site. This requires an integrated approach between the developers and different parts of the Borough and County Councils:

- Road and junction widths, and the positioning of provision for on-street parking, do not preclude a full length bus from operating into and around it.
- The introduction of a bus gate and its Traffic Regulation Order should be coupled with an existing service being rerouted or a new service introduced. If or where necessary, the capability to enforce now exists in Hertfordshire.

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Active and Sustainable Travel

Sustainability Criteria - Active and Sustainable Travel

Area of Work	Criteria
Design	Proposals **must**... • Consider the needs of vulnerable road users including pedestrians and cyclists from the beginning of the design process. • Produce a travel plan to accompany a planning application if required. • Include appropriate provision for electric vehicle (EV) charge points (see separate chapter for details). Proposals **could**... • Provide cycle and pedestrian priority over motor vehicles in the design of streets. • Design layouts using the Healthy Streets objectives and principles.
Pedestrian and Cycle Links	Proposals **must**... • Link new cycle and walking routes to existing networks. • Provide safe and suitable means of access to and from the site for all users. • Include safe cycle routes and provision for cycle parking. • Provide safe, accessible, direct and convenient routes within the new development and wider area. Proposals **should**... • Provide cycle parking which is covered, secure, signed and easily accessible from the network. • Enhance the active travel network wherever possible. • Include active travel infrastructure, ideally fully segregated.

Active and Sustainable Travel

	• Ensure that provision complies with Local Transport Note LTN1/20. • Provide secure cycle storage, changing, showering facilities and cycle maintenance stands in non-residential developments. Proposals **could**... • Introduce a cycle hire scheme into larger developments. • Introduce a car club scheme to ensure that not owning a car is more feasible. • Provide information to new residents on the range of active travel provision available in the area.
Public Transport	Proposals **must**... • Provide measures which will improve and support public transport provision and access. Proposals **should**... • Ensure that bus stops are fully accessible. Proposals **could**... • Enhance existing bus stops and services.

7

Electric Vehicle Charging Provision

Introduction

7.1 As noted in the preceding chapter, transport is a key contributor to UK carbon emissions. Electric vehicles are a key means of reducing these emissions, and the Government sees a significantly increased uptake of Electric Vehicles as a key part of the shift away from fossil fuels to cleaner energy. However, moving millions of vehicles towards zero emissions is a major challenge and requires significant amounts of new infrastructure across the country. This is particularly important in encouraging the uptake of Electric Vehicles, as owners and drivers need to be confident that they have or can easily get sufficient charge to complete their journeys (so called "range anxiety").

7.2 Unlike for petrol or diesel powered cars, the infrastructure for Electric Vehicles can be spread much more widely. Drivers can potentially charge their vehicles at home, at work, in public car parks or elsewhere. To enable this, it is important that new developments provide the right amount of charging infrastructure in the right places. Doing this at the time of construction will be substantially cheaper than trying to retrofit at a later date.

EV Charging Policy and Guidance Context

	National	Local
Policy/ Legislation	• National Planning Policy Framework (NPPF) Chapter 9 – Promoting Sustainable Transport. • Building Regulations Approved Document S. • General Permitted Development Order Schedule 2 Part 2 (D & E)	• Welwyn Hatfield Local Plan Policies SADM3 and SADM12. • Hertfordshire County Council Local Transport Plan 4 (LTP4) Policy 5.
Other Considerations		• Hertfordshire Climate Change and Sustainability Partnership (HCCSP) Action Plan for Transport.

Electric Vehicle Charging Provision

National Policy Requirements

7.3 The National Planning Policy Framework (2021) requires that when setting local parking standards for residential and non-residential development, policies should take into account the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles (paragraph 111 (e)).

7.4 When considering applications, the NPPF (2021) notes that applications for development should be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations (paragraph 116 (e)).

7.5 There is some provision under permitted development for the installation of off-street wall-mounted and free-standing electric vehicle charging points, subject to constraints including size, location and proximity to heritage assets (The Town and Country Planning (General Permitted Development) (England) Order 2015 (As Amended), Schedule 2, Part 2, Classes D and E).

7.6 Installation of electric vehicle charging points can also be undertaken by Local Authorities as part of the permitted development allowed on land within their ownership or management (The Town and Country Planning (General Permitted Development) (England) Order 2015 (As Amended), Schedule 2, Part 12, Class A).

7.7 On 15th June 2022, Building Regulations Approved Document 'S' came into effect in England, requiring installation of electric vehicle charging points, or the necessary infrastructure to enable them in future, for all new residential and non-residential buildings; buildings undergoing a material change of use to dwellings; residential and non-residential buildings undergoing major renovation; and mixed-use buildings that are either new, or undergoing major renovation.

7.8 The Regulations set out the required number/proportion of charging points (active and passive) per development, details of their location/installation/design, and technical requirements. Implementation of these Regulations are also subject to an average capped connection cost per charging point as a fixed sum for new buildings or a percentage of major renovation costs.

7.9 The Regulations do not apply to work subject to a building notice, full plans application or initial notice submitted before 15 June 2022, provided the work had started on site before 15 June 2023.

Local Plan Requirements

7.10 The WHBC Local Plan, Policy SADM3 (Sustainable Travel for All) requires that "Development proposals should make provision where appropriate for:… viii. Facilities for charging plug-in and other ultra-low emission vehicles."

7

Electric Vehicle Charging Provision

7.11 Policy SADM12 (Parking, Servicing and Refuse) says "An appropriate level and type of vehicle charging infrastructure will be incorporated into town centre parking areas and at new or regenerated neighbourhood centres where the opportunity arises. Appropriate provision should also be made within new residential, employment and leisure related development."

7.12 EV charging technology has moved on rapidly in recent years and although there is some reference to EV charging in the Local Plan policies, little specific detail is included. This is a fast moving environment and with the recent changes to Building Regulations, the Council considers that is appropriate to clarify local standards.

Other Topic Specific Considerations

7.13 Beyond planning, other local policies and strategies have a bearing on the roll out of EV charging infrastructure, particularly that in publicly accessible areas.

7.14 The Hertfordshire County Council Local Transport Plan 4 (May 2018) sets out the County Council's approach to Development Management and Policy 5 says that "The county council will work with development promoters and the district and borough councils to…ensure that any new parking provision in new developments provides facilities for electric charging of vehicles…" and goes on to say that district and borough councils should support the take up of Ultra Low Electric Vehicles (ULEV's) by requiring developers to include charging infrastructure in new developments.

7.15 The Hertfordshire Climate Change and Sustainability Partnership (HCCSP), has developed a number of action plans, including one for transport, which was recently updated earlier this year (2024). In the strategy, a number of themes / outcomes are set out, one of which is to "facilitate appropriate EV charging networks across Hertfordshire". Whilst none of the action points directly relate to planning provision for the charging infrastructure, several actions relate to the public sector acting in an enabling or facilitating capacity to extend the charging network where possible, such as using publicly owned charge points and those owned by private companies which could potentially be made available out of hours. A further action point seeks to facilitate taxi services in the county to be electric.

7.16 At a Welwyn Hatfield level, the Council has undertaken a programme of installation of charge points in its own property estate as and when opportunities and funding have allowed. Through the on-street residential chargepoint scheme (ORCS) we have installed approximately 196 public chargepoints (as of July 2024), in neighbourhood centres including Woodhall, Hollybush and Moors Walk in Welwyn Garden City, and in The Common multi storey car park in Hatfield.

Electric Vehicle Charging Provision

7.17 Under the Local Electric Vehicle Infrastructure fund, the Council are working with Hertfordshire County Council to install a number of on street electric vehicle charge points in strategic locations around the borough.

7.18 As noted above, charging facilities can be found and installed more widely than petrol or diesel infrastructure, and many owners of electric vehicles have charge points installed at their home. Often, these chargers can be installed at home without the need for planning permission, though permission and/or listed building consent may be required if your home is a listed building, or within a Conservation Area of within the Welwyn Garden City Estate Management Area. Further details about works which can be undertaken by residents and whether they require planning permission can be obtained by visiting the Council's website at Planning consent for altering your home – Welwyn Hatfield Borough Council (welhat.gov.uk).

Objective: To encourage and facilitate the transition away from fossil fuel powered to electric vehicles by ensuring that charging infrastructure is widely available and easily accessible

Sustainability Criteria - EV Charging Provision Requirements

7.19 As can be seen, policy at both national and local level is trying to facilitate the roll out of an EV charging network, and the Council has used its own property holding to install public charge points when possible. However, local planning policy is also required to set out clear standards for developers of all types to ensure that the transition to electric vehicles is as smooth as possible and that owners and occupiers of new properties are not required to arrange and fund unnecessary retrofitting of such equipment.

7.20 Because requirements for charging facilities in new developments are largely set out in building regulations, this chapter – unlike the others in this document – does not set out what developers "must", "should" and "could" do, but instead clarifies how national standards will be applied in Welwyn Hatfield.

7.21 The table below sets out the provision of EV charging infrastructure which developers will be required to make on different types of residential development. It builds on national building regulations, and seeks to build on and clarify Local Plan Policy SADM3:

Type of Development	Requirement
Houses with garages and / or driveways	1 active charge point per dwelling
Houses with private off-curtilage parking	• 1 active charge point per space, where spaces are allocated to

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Electric Vehicle Charging Provision

Houses with private non-allocated off-curtilage parking	specific dwellings; and / or • 1 active charge point per dwelling, up to the number of dwellings, where spaces are not allocated to specific dwellings; and • Any remaining spaces to have passive provision.
Flats with allocated external, basement or undercroft parking	
Flats with unallocated external, basement of undercroft parking	
Halls of residence	Use the same requirements as for flats
Care homes, sheltered accommodation and residential care	• Any residents' spaces to use the same ratio as residential properties (as above); and • Any employees' spaces to use the same ratio as commercial (as below)
Houses in Multiple Occupation (HMO's)	1 active charge point per parking space

7.22 The table below sets out the provision of EV charging infrastructure which developers are required to make on different types of non-residential development:

Type of Development	Requirement
Commercial, e.g. office, industrial or distribution	20% active provision with a further 20% passive provision across all spaces
Retail	On parking provision of 20 spaces and above, 10% should have active provision. Of these, 50% should be rapid charge
Public or shared retail / neighbourhood centre car park	Same requirement as Retail
Leisure uses	Same requirement as Retail
Hotel	Same requirement as Commercial
Education / nurseries / day centres / medical (surgeries and clinics, including veterinary)	Any employees' spaces to use the same ratio as Commercial
Other	On parking provision of 10 spaces and above, 10% should have active provision unless it can be justified that this is inappropriate or unnecessary

Electric Vehicle Charging Provision

7.23 For the above requirements based on percentages, the number of charge points should always be rounded up. Where the above requires provision of both active and passive spaces, both calculations should be made using the total number of spaces as a whole. Where active provision is required, at least one charge point should serve an accessible parking space. Where passive provision is required at least one accessible parking space should be capable of future connection.

7.24 Active charge points are defined as a facility for charging electric vehicles that is already installed, connected to the electrical network, fully working and has the ability for the owner to connect to a vehicle. It should be a minimum of 7kW and have smart charging capabilities. If a communal facility, it should come with a back office system which complies with the Open Chargepoint Protocol (OCPP).

7.25 Passive charge points are defined as a parking space or area which does not have an active charge point already installed, but which is connected to the electrical network in such a way that an active charge point can easily and readily be installed at a later date if necessary.

7.26 Rapid charging is defined as a charge point which enables vehicles to charge more quickly than the majority of domestic charging facilities. It should be a minimum of 50kW and be installed with a back office system which complies with the Open Chargepoint Protocol (OCPP).

8

Climate Change Adaptation

Introduction

As the effects of climate change increase, and the impacts become more significant, more will be needed to adapt to this. Likely impacts in the UK include warmer, wetter winters and hotter, drier summers, along with more frequent extreme weather events. Whilst much work, and many of the actions in this document are concerned with reducing carbon emissions, it is important to understand that the climate is changing and will continue to change in the future. As a result, it is important that measures to adapt to a changed and changing climate are included within developments wherever possible, to ensure strong resilient communities.

Climate Change Adaptation Policy Context

	National	Local
Policy/ Legislation	National Planning Policy Framework (NPPF) Chapter 14 – Meeting the challenge of climate change, flooding and coastal change. National Adaptation Programme Third National Adaptation Programme (NAP3) - GOV.UK (www.gov.uk) UK Climate Change Risk Assessment 2022	Welwyn Hatfield Local Plan – Policy SP1 and SP10. Strategic Action Plan: Water Sustainability Aug 2021 (hccsp.org.uk)
Other Considerations	Building Futures Sustainable Design Toolkit Climate adaptation toolkit and risk generator Overheating in New Homes - Good Homes Alliance DfT Climate Change Adaptation and Transport Infrastructure REA Adapting to Climate Change - Institute for Government	Local Government Association Climate Adaptation Toolkit Local Climate Adaptation Tool

Climate Change Adaptation

	Heatwaves in England to Inform UK Policy - LSE	

Local Plan Requirements – Climate Adaptation

8.1 Local Plan Policy SP1 says that a principle which is applied is that "adaptation and mitigation principles relating to climate change are incorporated into the design and construction of new development which include energy and water efficiency measures, the use of low carbon and renewable energy, the provision of green infrastructure and sustainable drainage systems (SUDs)"

8.2 Policy SP10 – Sustainable Design and Construction – says that a sustainable design statement should include "site and building-level landscaping and features [to] promote biodiversity and help achieve other aims, such as climate change adaptation, flood risk and amenity" then refers to the Building Futures Sustainable Design Toolkit for more detailed guidance.

Objective: To ensure that the borough is well equipped to respond to a changing climate

8.3 Many of the measures outlined in earlier sections of this document are concerned with climate change adaptation as well as reducing carbon emissions. For example, flood risk assessments seek to ensure that developments are not undertaken in places which may flood, and that any development is not impacted in the event that flooding were to take place. In addition, Sustainable Drainage Systems (SuDS) can help cooling as they enable water to evaporate whilst soaking into the ground rather than just being transported away from the site as quickly as possible, and can provide a habitat.

8.4 Well designed buildings can minimise overheating and well designed places can contribute towards community resilience by addressing and seeking to mitigate the potential effects of temperature extremes, increased risk of flooding, and more frequent and more intense weather events.

8.5 Well designed places incorporate nature based solutions into their design which can help mitigate the worst effects of climate change. This includes actively seeking to reduce or break up the amount of hard standing, increasing the number of trees or planting in a development to increase shade, ensuring that any planting is appropriate to a changing climate and can cope well with dry spells and other measures. Other features which can help mitigate the worst effects of climate change include the use of green roofs with appropriate species, water features etc. Many of the design elements and features explored in earlier chapters help mitigate the effects of climate change as well as seeking to reduce the overall direct impact on the climate.

8

Climate Change Adaptation

Sustainability Criteria - Climate Change Adaptation

Objective	Criteria
Adapt to a changing climate	Proposals **must**… • Ensure that climate change adaptation and mitigation principles are incorporated into the design and construction of new developments. • Use site and building level landscaping to promote biodiversity and achieve other aims including managing flood risk and adapting to climate change. Proposals **should**… • Have tree and vegetation planting within the development which will, among other benefits, provide shading to protect against higher temperatures. • Planting should be strategic so that hardy, robust species are chosen that can withstand periods of drought. Proposals **could**… • Install green roofs and / or walls with appropriate species to help insulate buildings and assist with cooling, as well as providing biodiversity benefits. • Provide features in communal areas which provide shading such as covers or canopies. • Maximise the use of lighter coloured rather than darker coloured materials where possible, to help reflect light and reduce heat, and use natural materials for fencing and partitions where possible. • Have permeable driveways and / or driveways with some planting space to allow water run off • Enhanced SuDS tree pits could be used across all types of development instead of regular trees to provide benefits to the public realm.

Appendix A - Sustainability Checklist

Topic	Relevant Local Plan Policy	Objective/Task	Must/ Should/ Could	Criteria	Achieved? (Yes, No, N/A)	Please state evidence/signpost to relevant information within planning application submission, or state why this is not applicable
Passive Design	SP9 SADM11 SP10 SADM13	Ensure the design and layout of development incorporates passive solar gain, cooling, overheating and ventilation measures	Must	Conform to Building Regulations – Part F, Part L, Part O		
				Feature dual aspect dwellings (wherever feasible)		
				Have satisfactory levels of sunlight and daylight within buildings and open spaces, and garden areas in particular		
			Should	Adopt any of the following passive design elements, and demonstrate their inclusion in development proposals, to reduce the need for artificial lighting, heating and cooling: · Site layout, design and relationship between buildings and adjacent uses to maximise the reduction of carbon emissions		

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Appendix A - Sustainability Checklist

				· Orientation of buildings and whether they have a single or dual aspect (or more) · Incorporate elevation design, including materials choice, fenestration design, shading devices and eaves design to maximise passive design principles · Include planting and soft landscaping specifically aimed at positive passive design into development proposals, including green roofs, which can afford shade and stabilise microclimates		
				Utilise the Hertfordshire Building Futures Sustainable Design Toolkit to inform design choices, focusing in particular on: · How will energy demand for heating, lighting and cooling be avoided?		
			Could	Utilise passive solar gain, cooling, overheating and ventilation relative to the building's use and location,		

Appendix A - Sustainability Checklist

				and demonstrate how the implementation of these principles have resulted in a reduction in energy consumption and carbon emissions		
				Achieve Criteria 1 to 5 for BREEAM ENE 04 (non-domestic)		
				Achieve Passivhaus certification, specifically showing (domestic): · A signed PHPP showing calculations on shading, ventilation, SummVent, Summer (all matters relating to passive design) · Required planning documents relating to passive design (see list in footnotes) Supporting documents relating to passive design (see list in footnotes)		
Energy Efficiency	**SP10** **SADM13**	Consider energy consumption	Should	Consider the Whole Life-Cycle Carbon Impact of development proposals		

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Appendix A - Sustainability Checklist

		during the whole life cycle of a building	Could	Submit a RICS Whole Life-Cycle Carbon Assessment		
				Achieve a WLC Benchmark score as follows: A1-A5 - <750 B-C (excluding B6 and B7) - <370 A-C (excluding B6 and B7) - <1000		
		Build an energy efficient building envelope	Must	Have U-values conforming to Building Regulations specified for walls, floors, roofs, windows and doors		
				Have air permeability performance conforming to Building Regulations		
				Have Y-values conforming to Building Regulations specified for thermal bridges		
			Should	Consider layout and design of site to maximise opportunities to reduce carbon emissions (see chapter on Passive Design)		

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			Could	Be thermal bridge free where possible, or minimise all unavoidable thermal bridges		
				Identify a sustainability standard that exceeds minimum current building regulations as part of their planning application and then use an industry-recognised process to demonstrate compliance with that standard upon completion of their development		
				Achieve U-values for wall, roof and floor elements of between 0.1 and 0.15 (Passivhaus rule of thumb)		
				Have air permeability performance no greater than 0.6m3/h @50pa		
		Incorporate renewable energy and low carbon measures	Must	Have at least 92% efficiency for gas boilers providing wet heating (e.g. radiators)		
				Have at least 91% efficiency for regular oil boilers/86% efficiency for combi oil boilers providing wet heating		

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			Should	Consider the use of renewable and low carbon energy in line with energy hierarchy and justify their non-inclusion (if applicable)		
			Could	Utilise mechanical ventilation with heat recovery		
				Utilise low carbon heat generation (see examples listed above)		
				Utilise on-site renewable energy generation		
				Utilise on-site battery energy storage		
		Install energy efficient fixtures and fittings	Must	Minimum efficacy of all fixed lighting within Building Regulations		
			Should	Have energy efficient lighting in all light sources, unless demonstrated this is not technically feasible		
			Could	Have minimum A-rated energy efficiency for all appliances installed before operational use		
		Consider retrofit over rebuild	Must	Conform to Building Regulations for any modifications/extensions to an existing property		

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			Should	Adopt a ‘fabric first’ approach if planning to make energy efficiency improvements to an existing property		
			Could	Retrofit an existing building rather than demolishing and rebuilding		
				Utilise an existing standard/specification for the retrofit of an existing building and achieve accreditation		
		General	Must	Achieve a BREEAM ‘excellent’ rating for all non-residential development over 1000 square metres		
			Could	Have 15kWh per square metre net space heating energy consumption per year or lower (domestic)		
				Assess the predicted baseline energy demand and emissions for the site, including site-wide heating, cooling, ventilation, and electricity from all site uses including street lighting		

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				Ensure a building user guide is provided to allow occupants to fully understand how the building works and utilise its energy most efficiently		
				Achieve a minimum of 16 BREEAM credits from the Energy category (non-residential)		
Water Efficiency	**SP10** **SADM13**	Reduce water consumption	Must	Have a water consumption not exceeding 110 litres per person per day (domestic)		
			Should	Require a management plan during construction identifying water use and measures to reduce net water consumption		
				Have home Quality Mark (HQM) optional fittings standard for all water fittings/appliances (residential)		
			Could	Net potable water consumption of 80 litres per person per day or less (domestic)		
				Have home Quality Mark (HQM) advanced fittings standard for all water fittings/appliances (domestic)		

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				Achieve BREEAM Performance Level 5 for all components listed in water consumption performance levels (except for greywater and rainwater system) (non-domestic)		
				Achieve 5 or more credits in BREEAM Wat01 (non-domestic)		
		Incorporate rainwater harvesting	Must	Ensure that any rainwater harvesting system complies with British Standards		
			Should	Incorporate any form of rainwater harvesting		
			Could	Demonstrate that the demand for non-potable water (e.g. WC flushing) is being partly met by rainwater/greywater		
		Incorporate greywater re-use	Must	Ensure that any greywater system complies with British Standards		
			Should	Require any form of greywater re-use		
			Could	Demonstrate that the demand for non-potable water (e.g. WC flushing) is being partly met by rainwater/greywater		

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		General	Must	Meet at least BREEAM 'excellent' rating for all non-residential development over 1000 square metres, unless it is demonstrated that this is not technically feasible or viable		
			Could	Achieve a minimum of 15 credits in the Water Efficiency section in the Home Quality Mark (domestic)		
				A minimum of 9 BREEAM credits from the Water category (non-domestic)		
Drainage and Flood Risk	**SADM14**	Flood risk assessment	Must	Be consistent with relevant national planning policy such as the sequential test and guidance, local and regional strategies and plans, and the latest flood risk information available		
				Follow the sequential approach to development. If the sequential test is passed, the sequential approach should be followed which says areas at flood risk should not be developed. If that is not possible, then details of how existing flood risk will be safely mitigated should be provided		

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				Prepare any flood risk assessments in accordance with the requirements and advice set out in the Council's Strategic Flood Risk Assessment.		
				Protect and enhance the flood risk management function of existing overland flow routes, watercourses and flood plains/storage areas to ensure there is no net loss of flood storage, flows are not impeded, and opportunities to make space for water are taken.		
				Maintain an appropriate development free corridor along watercourses and take opportunities to naturalise watercourses to improve their condition, ecological status, biodiversity and habitat connectivity.		
				Consider the fluvial flood risk presented by ordinary watercourses.		

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			Should	Incorporate additional flood resilience measures such as raised Finished Floor Levels, to ensure the longevity of the site[(25)].		
				Actively seek to reduce flood risk in the vicinity of the site, to provide off-site benefits to local communities.		
			Could	Contribute funding/S106 monies etc to local efforts to maintain or upgrade ordinary watercourses/ditches, etc.		
		Sustainable urban drainage systems (SuDS)	Must	Be incorporated into the design of the proposal from the earliest stage.		
				Be designed in accordance with national standards and advice from relevant flood risk management bodies. This should include no flooding to occur on new sites up to and including the 1 in 30 year storm events, with no flooding to leave the site uncontrolled during the 1 in 100 year event.		

25 (NOTE - The LLFA recommends 300mm above the local estimated flood level or at least 150mm above surrounding ground levels – the EA recommend 600mm) See: Preparing a flood risk assessment: standing advice - GOV.UK (www.gov.uk). The reason the LLFA recommend this is because they require all developments to be designed for a storm defined by the EA.

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				Follow the SuDS hierarchy, giving priority to above-ground, open blue-green SuDS features before resorting to underground structures		
				Restrict discharge to the 1:1 or QBAR greenfield runoff rates, or as close as practicable		
				Protect water quality by including an appropriate number of treatment stages before discharge		
				Avoid infiltration discharges in groundwater Source Protection Zone 1 (most vulnerable)		
				Consider the discharge hierarchy (in para 5.9) with priority given to rainwater harvesting/re-use before disposal		
				Adhere to requirements in Local Plan Policy SADM14		
				Not discharge surface water to foul sewers.		
			Should	Integrate the four pillars of SuDS (water quantity, quality, biodiversity and amenity)		

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				Be designed in accordance with the Non-statutory Technical Standards for SuDS (NSTS)		
				Retain or install, wherever possible, permeable surfaces and avoid large areas of hard surfacing.		
				Manage run off as close to the source as possible		
				Distribute SuDS throughout the site to promote a source control approach instead of relying on oversized attenuation at the end of the system		
				Use SuDS that are attractive and multifunctional.		
				Retrofit SuDS onto existing brownfield sites		
			Could	Install greenery, trees and green roofs wherever possible to aid absorbency.		

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				Retrofit SuDS into brownfield sites even for areas not being changed as part of redevelopment (e.g. Upgrade existing car parks to be permeable paving)		
Active and Sustainable Travel	**SP4** **SADM3**	Design	Must	Consider the needs of vulnerable road users including pedestrians and cyclists from the beginning of the design process.		
				Produce a travel plan to accompany a planning application if required.		
				Include appropriate provision for electric vehicle (EV) charge points (see separate chapter for details).		
			Could	Provide cycle and pedestrian priority over motor vehicles in the design of streets.		
				Design layouts using the Healthy Streets objectives and principles.		
		Pedestrian and Cycle Links	Must	Link new cycle and walking routes to existing networks.		
				Provide safe and suitable means of access to and from the site for all users.		

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				Include safe cycle routes and provision for cycle parking.		
				Provide safe, accessible, direct and convenient routes within the new development and wider area.		
			Should	Provide cycle parking which is covered, secure, signed and easily accessible from the network.		
				Enhance the active travel network wherever possible.		
				Include active travel infrastructure, ideally fully segregated.		
				Ensure that provision complies with Local Transport Note LTN1/20.		
				Provide secure cycle storage, changing, showering facilities and cycle maintenance stands in non-residential developments.		
			Could	Introduce a cycle hire scheme into larger developments.		
				Introduce a car club scheme to ensure that not owning a car is more feasible.		

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				Provide information to new residents on the range of active travel provision available in the area.		
		Public Transport	Must	Provide measures which will improve and support public transport provision and access.		
			Should	Ensure that bus stops are fully accessible.		
			Could	Enhance existing bus stops and services.		
EV Charging	**SADM3** **SADM12**	Encourage and facilitate the transition away from fossil fuel powered to electric vehicles by ensuring that charging infrastructure is widely available and easily accessible	N/A	Requirement as stated in chapter (depending on land use)		

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Climate Change Adaptation	**SP1** **SP10**	Adapt to a changing climate	Must	Ensure that climate change adaptation and mitigation principles are incorporated into the design and construction of new developments.		
				Use site and building level landscaping to promote biodiversity and achieve other aims including managing flood risk and adapting to climate change.		
			Should	Have tree and vegetation planting within the development which will, among other benefits, provide shading to protect against higher temperatures.		
				Planting should be strategic so that hardy, robust species are chosen that can withstand periods of drought.		
			Could	Install green roofs and / or walls with appropriate species to help insulate buildings and assist with cooling, as well as providing biodiversity benefits.		

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				Provide features in communal areas which provide shading such as covers or canopies.		
				Maximise the use of lighter coloured rather than darker coloured materials where possible, to help reflect light and reduce heat, and use natural materials for fencing and partitions where possible.		
				Have permeable driveways and / or driveways with some planting space to allow water run off		
				Enhanced SuDS tree pits could be used across all types of development instead of regular trees to provide benefits to the public realm.		

Welwyn Hatfield Borough Council