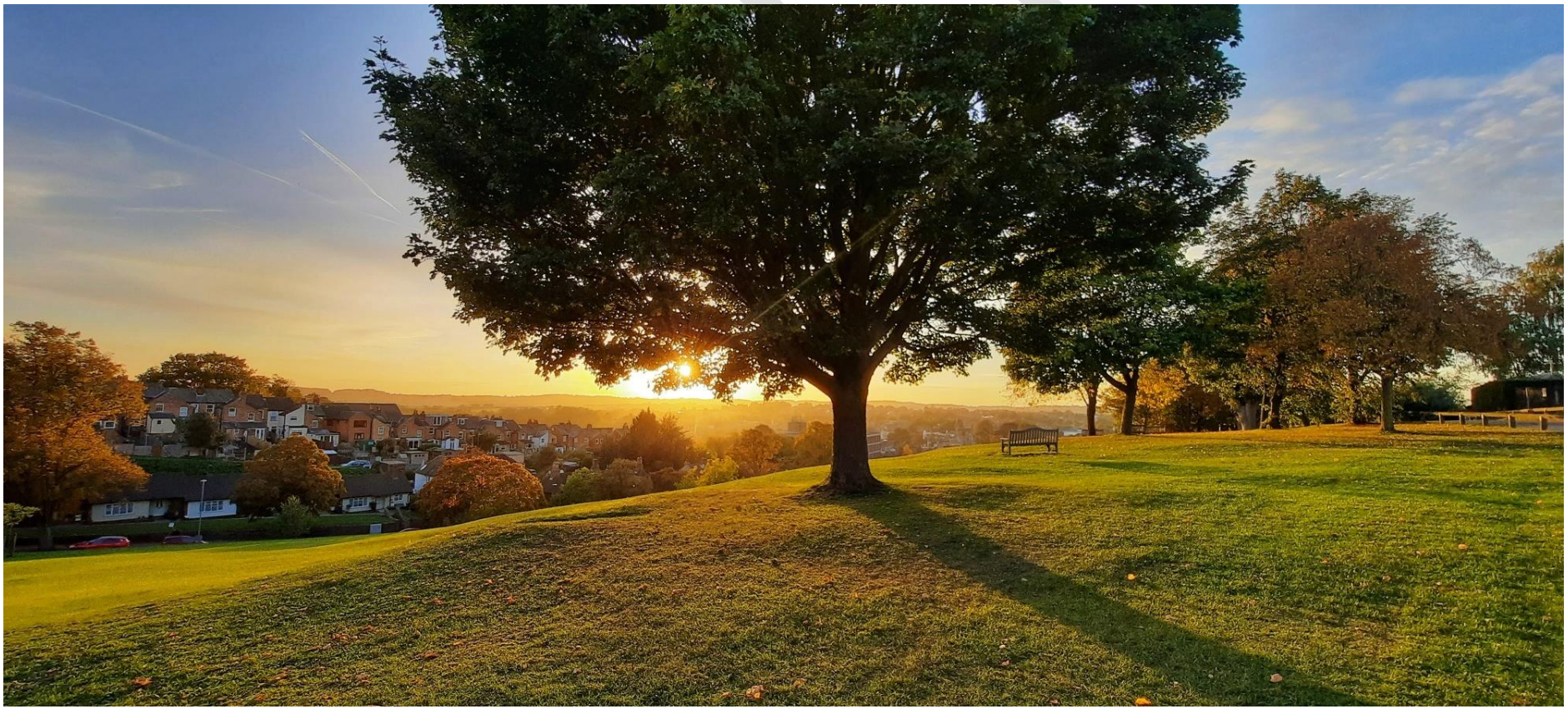
North Herts Council

Sustainability

Supplementary Planning Document



Sustainability

Draft Supplementary Planning Document

November 2023

Foreword

This supplementary planning document sets out the standards required to meet the visions, objectives and policies of the North Herts District Local Plan as sustainably as possible. It comes at a critical time in the approach to climate change and the environmental crisis by both local and national government, and after Parliament revised the 2008 Climate Change Act to bring carbon reductions to 100% by 2050.

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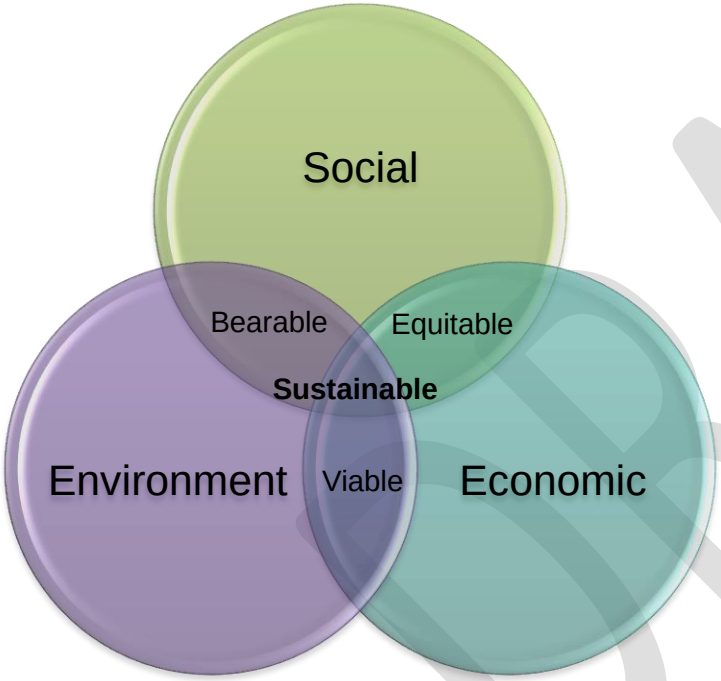
1 INTRODUCTION

Sustainability refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs. In the context of planning, sustainability refers to the development of policies, programs, and projects that are environmentally sound, socially just, and economically viable.



Sustainable planning takes into account the three pillars of sustainability:

- Environmental - protecting the natural environment and resources,
- Social - ensuring that everyone has access to basic needs such as housing, food, and healthcare, and
- Economic - creating a strong economy that can provide jobs and opportunities for everyone.

There are many ways to incorporate sustainability into planning. Some common approaches include:

- Conserving resources: This can be done by using energy-efficient buildings, heating and lighting, recycling and composting, and reducing waste.
- Planning for climate change: This can be done by planting trees to mitigate urban heat island effects, developing drought-resistant crops and building seawalls to protect coastal communities from flooding.
- Creating equitable communities: This can be done by providing affordable housing, investing in public transportation, and creating jobs in green industries.

By incorporating sustainability into our plans, we can ensure that our communities are healthy, resilient, and prosperous for generations to come.

The North Hertfordshire Local Plan (NHLP) was adopted in November 2022 and includes an objective to address climate change by improving opportunities for travelling by public transport, walking and cycling, using natural resources more efficiently, reducing water demand, securing high quality sustainable design and managing the flood risk.

On 21 May 2019, North Herts District Council (NHDC) passed a climate emergency motion. The declaration asserted the council's commitment toward climate action beyond current

government targets and international agreements. In July 2023 the Council declared an ecological emergency identifying biodiversity and nature recovery as strategic priorities for planning policies for new development. This included a pledge to identify appropriate areas for habitat restoration and biodiversity net gain and to ensuring that development limits the impact on existing habitats.

Our Climate Strategy: 2021 – 2026 was reviewed in 2021 and outlines our key objectives:

- achieve Carbon Neutrality for the Council's own operations by 2030;
- ensure all operations and services are resilient to the impacts of climate change;
- achieve a Net Zero Carbon district by 2040; and
- become a district that is resilient to unavoidable impacts of climate change

This accords with the overwhelming national and international consensus that radical measures are required across the whole of society to reduce man-made greenhouse gas emissions. In late 2018, the UN Intergovernmental Panel on Climate Change (IPCC) issued a stark warning. It established that achieving the ambitions of the Paris Climate Agreement, by limiting warming to 1.5°C to avoid the most catastrophic impacts of climate change, will require action at an unprecedented pace and scale.

Deep cuts in greenhouse gas emissions from the global economy are required by 2030, with net zero emissions by 2050. This enormous challenge can only be tackled by governments, businesses and civil society working together to take ambitious action to radically reduce emissions.

On 24 June 2019 the UK became the first major economy in the world to pass laws to end its contribution to global warming by 2050. The target will require the UK to bring all greenhouse gas emissions to net zero by 2050. Subsequently, the government published milestone targets for 2030 and 2035, relative to 1990 carbon emission levels:

- 68% reduction by 2030 (Nationally Determined Contribution, as communicated to the United Nations Framework Convention on Climate Change).
- 78% reduction by 2035 (UK's Sixth Carbon Budget, enshrined in The Carbon Budget Order 2021)

Currently the built environment is responsible for approximately 25% of carbon dioxide emissions so it is imperative that this becomes an even greater focus for reducing emissions in that sector. While the planning system is not able to greatly influence the vast majority of buildings which have already been built, it is important to ensure that where the planning system has influence, such as with new development, that it is as sustainable as possible and avoids the need for future expensive retrofitting to make buildings more sustainable.

Climate change mitigation

Climate change mitigation requires the reduction of greenhouse gas emissions. Radical measures are required across the whole of society to reduce man-made greenhouse gas emissions. In late 2018, the UN Intergovernmental Panel on Climate Change (IPCC) established that achieving the ambitions of the Paris Climate Agreement, by limiting warming to 1.5°C to avoid the most catastrophic impacts of climate change, will require action at an unprecedented pace and scale.

Climate change adaptation

Even if the world manages to limit greenhouse gas emissions sufficiently to cap global temperature rise to below 1.5°C, further climatic changes are still inevitable in the future as, according to the Met Office, approximately 1.0°C of global temperature rise has already occurred. The UK needs to manage the growing risks from climate change.

The Government climate change predictions in the UK Climate Projections 2018 report predict hotter, drier summers; wetter winters and more extreme weather events such as storms with attendant localised heavy rainfall.

Adaptation to predicted climate change therefore needs to encompass planning for higher risk of surface water flooding, more prolonged droughts leading to water stress on people, the environment and wildlife; and more frequent heatwaves leading to increased adverse health impacts on the population, especially on the more vulnerable groups, such as the elderly.

Planning policy provides an important mechanism for contributing to environmental sustainability in the built and natural environment[1], including to reduce carbon emissions and address how the

[1] National planning policy (NPPF, paragraph 7) sets out that the purpose of the planning system is to contribute to the achievement of sustainable development and its relationship with the 17 United Nations Global Goals for Sustainable Development

environment should be developed to allow for adaptation to a changing climate (also referred to as resilience).

The function of this Supplementary Planning Document (SPD) is to support and supplement the District's Local Plan policies, and national planning policy. Therefore, the adopted Local Plan policies should always be considered in conjunction with this SPD.

Scope of the SPD

This document is designed to provide further guidance and to set out what our expectations are for different forms of development when applying the Local Plan policies (see Table1). Appendix F provides a summary of the main sustainable construction requirements under both 'mitigation' to climate change (i.e. ways of reducing greenhouse gas emissions – mainly CO_2) and adaptation to predicted climate change. These requirements are set out for the 5 development types covered by this document.

- The SPD identifies design and energy-saving/efficiency measures that can result in a development minimising greenhouse gas emissions and energy use and waste, and creating places that are amenable to biodiversity and adaptable to a changing climate (including through the integration of green infrastructure) and;
- It provides guidance on renewable and low-carbon energy solutions, for reduced reliance on fossil fuels and finite energy sources, and for efficient use of national grid energy;
- It considers potential solutions to water shortages and efficiencies requirements;
- It addresses the materials and methods used in construction; and
- Provides clear guidance for anyone applying for planning permission, or wishing to comment upon a planning application, as well as providing a consistent approach to assessing planning applications.

Who is this SPD intended for?

This guidance document is for anyone involved in the development process, including landowners, developers/agents, designers, and householders considering any kind of schemes/development, including home conversions/extensions; town/parish councils and other interested parties commenting on proposals; and development management officers (DM) assessing applications. It is also a reference for anyone considering applying for permission for wind/solar energy (or other renewables/ low-carbon) farms/stations.

However, this guidance is not intended to be prescriptive and cannot substitute for the use of qualified architects, landscape architects, planners and environmental specialists where necessary.

The document also provides guidance (in chapters 2 and 3) for applicants and their consultants in terms of the evidence needed to comply with Local Plan policies and some technical information on different methods of meeting those requirements.

Appendices A-E provide sustainability checklists for the different development types with a summary table provided in Appendix F.

Status of the SPD

This SPD has been prepared in accordance with the Town and Country Planning (Local Development) (England) Regulations 2012 and has undergone consultation with local groups and national organisations, in accordance with the Council's Statement of Community Involvement (SCI). It has also been subject to screening for Habitat Regulation Assessment (HRA) and Strategic Environmental Assessment.

Once adopted the information contained within the SPD can be a material consideration in the determination of planning decisions. The advice in the Sustainability SPD could be used and applied in different ways dependent on the scale and nature of the development:

a. As voluntary, good practice guidance and advice which is not formally assessed as part of the application. This might be most appropriate for small-scale developments such as household extensions by local residents;

b. As a self-assessment checklist completed and submitted by the applicant which is subject to a light-touch review by officers as part of the application process; and

c. As a formal assessment of the credentials of the development which is examined and reported on by officers as part of the application process and secured, where required and appropriate, by planning conditions or other measures.

The most appropriate approach(es) for implementing the SPD and associated thresholds will be further developed during the consultation process taking account of the views of residents and local planning agents.

The SPD does not form part of the Development Plan and so cannot introduce new planning policies or add unnecessary financial burdens on development. Local planning authorities are required to review and, if necessary, update their local plan policies within five years of adoption, if not sooner. The North Herts Local Plan was adopted in November 2022 and included a commitment to an early Local Plan review. This will provide the appropriate vehicle for any comprehensive review of policies. In the meantime this SPD sets out the 'direction of travel' to support currently adopted policies.

Whilst some of the sustainability principles contained in this SPD can be applied to all new developments regardless of size, some are only applicable to larger developments. Appendices A-F identify which elements of the SPD are applicable to the different types and sizes of development.

Development types

The SPD covers the 5 main types of developments listed below. Whilst we strongly support the need to retrofit existing building stock to make it more energy and water efficient the planning authority has very limited influence over existing building stock and consequently this document does not address this specific issue. Section 4 provides additional guidance on the retrofitting of historic buildings.

The five main types of development addressed in this SPD are:

- **Major Residential** development includes all new developments and residential conversions of ten homes or more (Appendix A).
- **Minor Residential** development includes all new developments and residential conversions of one or more dwellings and less than ten dwellings (Appendix B).
- **Major Non-Residential** development includes all new non-residential development which either provides additional floor space of at least 1,000sqm or is on a development site of at least 0.5ha. Also includes all new forms of both infrastructure and works associated with infrastructure projects (Appendix C).
- **Minor Non-Residential** development includes all new non-residential development which provides additional floor space above 250sqm but below 1,000sqm of floor space and on a development site below 0.5ha (Appendix D).
- **Domestic Extensions, Outbuildings, and other Minor Operations** (Appendix E)

Policy context

The SPD has been prepared in the context of National and local planning policies including the North Herts Local Plan (adopted Nov. 2022). The table below lists national and local policies and guidance of particular relevance to this SPD.

Table 1 - Policy and guidance context

Topic	National policy/ Guidance	Local Policies/ Plans
Energy efficiency/ Passive Design	The Building Regulations	SP9 Design and Sustainability D1 Sustainable Design Hertfordshire Development Quality Charter
On Site Low Carbon and Renewable Energy	The Building Regulations Feed-in Tariffs Order 2021 as amended. Modifications to Conditions 33 and 34 of the Standard Conditions of Electricity Supply Licence Renewables Obligation Order 2015 (as amended) for England and Wales The Government's Build Back Greener (Net Zero Strategy) (Oct. 2021)	NE12 Renewable and low carbon energy development
Transport	The Transport Act 2000 (amended 2008) The Environment Act 1995 The National Emissions Ceiling Regulations 2018 The Environment Act 2021 The Environmental Targets (fine particulate matter) (England) Regulations 2023 Transport Decarbonisation Plan (2021) Second cycling and walking investment strategy (CWIS2) 2021–25	Hertfordshire Local Transport Plan LTP4 SP6 Sustainable Transport T2 Parking
Waste	Waste Management Plan for England National Planning Policy Framework NPPF	Hertfordshire Minerals & Waste Local Plans D1: Sustainable Design
Water	The Environment Act 2021 Water Environment Regulations (Water Framework Directive) 2017 UK Government's 25-year Environment Strategy National Policy Statement for Waste Water National Planning Policy Framework NPPF	SP11 Natural Resources and Sustainability NE8 Sustainable Drainage Systems NE10 Water Conservation and Wastewater Infrastructure

Green infrastructure (GI)	The Environment Act 2021 National Planning Policy Framework NPPF Environmental Improvement Plan 2023 (DEFRA) Natural England Green Infrastructure Guidance Planning Practice Guidance: Healthy and safe communities (2019) Spatial planning for health: An evidence resource for planning and designing healthier places. Space for people: Targeting action for woodland access. Planning for sport guidance	SP12 Green Infrastructure, Landscape and Biodiversity.
Air quality	The Environment Act 1995 Air Quality Standards Regulations (2010) National Emissions Ceiling Regulations 2018 The Environmental Targets (fine particulate matter) (England) Regulations 2023 The Environment Act 2021 UK Plan for tackling roadside nitrogen dioxide concentrations (2017) The NPPF	D4 Air Quality NHDC Air Quality Action Plan
Materials	The Building Regulations	SP1 Sustainable Design
Land use & wildlife	The NPPF The Conservation of Habitats and Species Regulations 2017 The Environment Act 2021	NHLP Strategic objectives (ENV3, ENV4) SP12 Green Infrastructure, Landscape and Biodiversity. NE1 Strategic Green Infrastructure NE4 Biodiversity and geological sites NE5 Protecting open space NE6 New and improved open space
Adaptation to climate change	Climate Change Act 2008 The Environment Act 2021 25 Year Environment Plan The NPPF The National Adaptation Programme (NAP3) The flood Risk Regulations 2009 Flood and Water Management Act 2010 The Building Regulations	NHDC climate emergency declaration NHDC ecological emergency declaration SP11 Natural Resources and Sustainability NE7 Reducing Flood Risk
Culture & community	Housing and Planning Act 2016 Health and Care Act 2022 The Localism Act 2011	SP10 Healthy Communities HS5 Accessible and Adaptable Housing

	Equalities Act 2010 The NPPF Digital Economy Act 2017 Neighbourhood Planning Act 2017 Infrastructure Act 2015	
Health & wellbeing	Health and Care Act 2022 The NPPF Public Health England: Spatial Planning for Health Planning Practice Guidance: Healthy and safe communities (2019) Space for people: Targeting action for woodland access. Planning for sport guidance	Hertfordshire Joint Strategic Needs Assessment (JSNA)

2 Objectives

Climate Change Mitigation

The UK is expected to experience warmer, wetter winters and hotter, drier summers with more frequent weather extremes as a result of climate change[2]. The highest emissions scenario predicts that summer temperatures in the UK could be 5.4°C warmer[3] by 2070 with average summer rainfall falling by 47%. Winters could be up to 4.2°C warmer, with up to 35% more rainfall.

The Climate Change Act 2008 provides an overall framework for climate change mitigation and adaptation action across the UK. It sets a legally binding goal of reducing UK greenhouse gas (GHG) emissions by 100% from 1990 levels (Net Zero) by 2050.[4]

NHDC declared a climate emergency in May 2019 pledging its commitment to achieve carbon neutrality for the Council's own operations by 2030 and to achieve a Net Zero District by 2040. NHDC's Climate Change Strategy 2022-2027 sets out how the Council will reduce its own carbon emissions to achieve a carbon neutral position by 2030 and what actions it will undertake to achieve a net zero carbon district by 2040.

The Tyndall Centre produced[5] an estimate of North Herts 'fair contribution' towards the Paris Climate Change Agreement, recommending that the District:

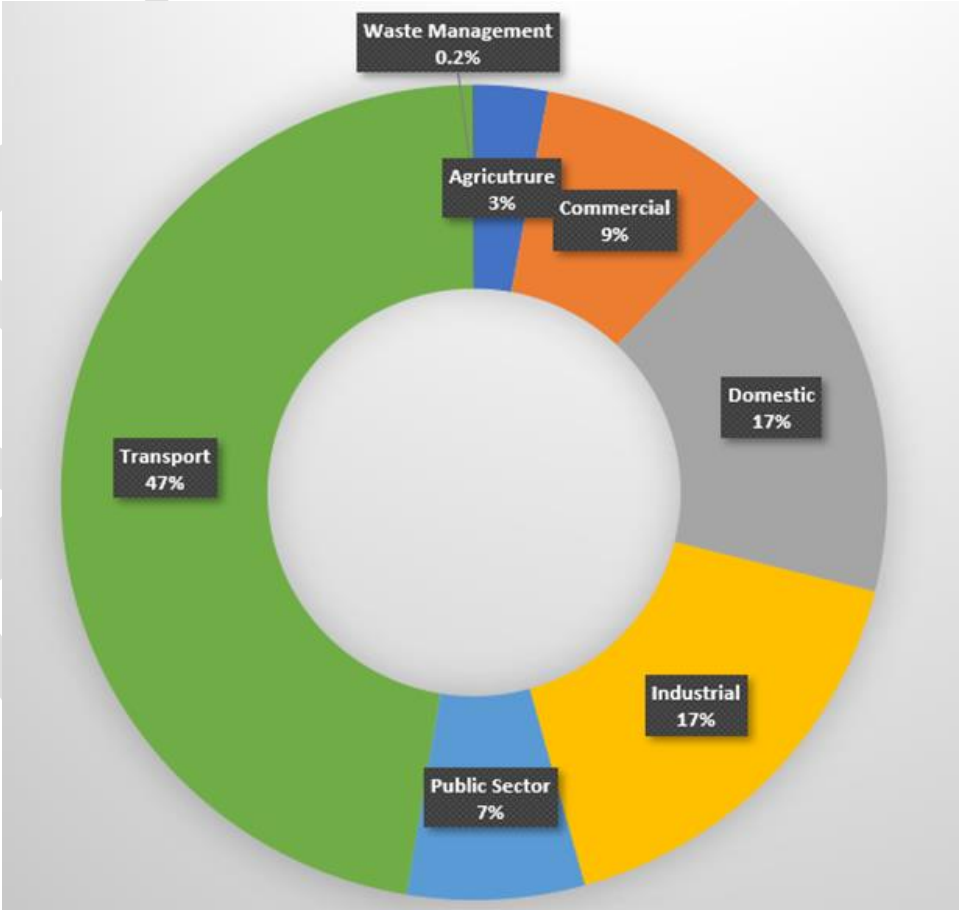


Figure 1 - Emissions by sector in North Herts (2021)

[2] The Met Office UK Climate Projections 2018 (UKCP18).
[3] Compared to the 1981-2000 average
[4] Updated in 2019 in recognition of the 2015 Paris Agreement and following advice from the Climate Change Committee (CCC).

[5] Tyndall Centre for Climate Change Research: Setting Climate Commitments for North Hertfordshire

- Stays within a maximum cumulative carbon dioxide emissions budget of 4.2 million tonnes (MtCO2) for the period of 2020 to 2100 by achieving average mitigation rates of CO2 from energy of around -13.5% (minimum) per year.
- Initiates an immediate programme of CO2 mitigation to deliver the above cuts in emissions in order deliver a Paris aligned carbon budget. Zero Waste
- Reaches zero or near zero carbon no later than 2041. The report provides an indicative CO2 reduction pathway that stays within the recommended maximum carbon budget of 4.2 MtCO2.
- In 2041 5% of the budget remains. Earlier years for reaching zero CO2 emissions are also within the recommended budget, provided that interim budgets with lower cumulative CO2 emissions are adopted.

In order to achieve the above the report recommended that the District:

- Seriously consider strategies for significantly limiting emissions growth from aviation and shipping.
- Promote the deployment of low carbon electricity generation within the region.
- Manages the Land Use, Land Use Change and Forestry (LULUCF) sector to provide CO2 sequestration where possible.

Zero Waste

Household, commercial and industrial, construction and demolition waste have economic and environmental consequences. Disposal of plastic, food and garden waste can release greenhouse gases, which contribute to climate change. The government's 'Our waste, our resources: a strategy for England' (2018) sets out a strategy for preserving material resources by minimising waste, promoting resource efficiency and moving towards a circular economy where products are reused and recycled (Figure 2). The Environment Act 2021 sets out a target of 50% reduction in the amount of residual waste (excluding major mineral waste) produced per person in England by the end of 2042, from 2019 levels.

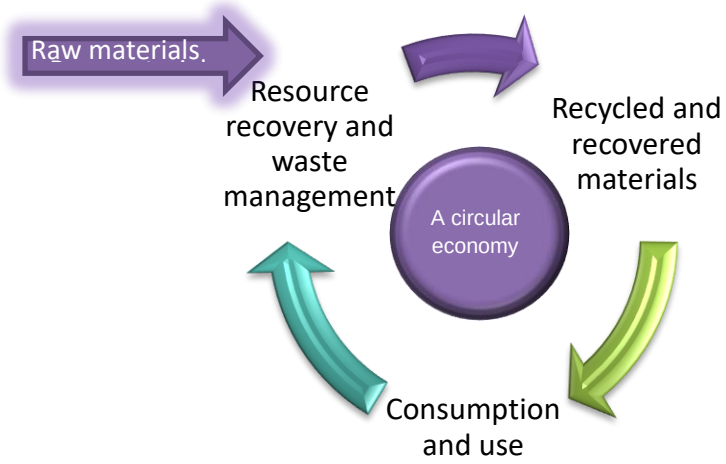


Figure 2 - The Circular Economy

The Hertfordshire Waste Development Framework sets out the spatial vision and strategic objectives for waste planning in Hertfordshire up to 2026. It seeks to achieve net self-sufficiency (to deal with the county's own waste) and to maximise recycling, recovery and processing of waste to minimise the amount of waste sent to landfill.

NHDC follows the principles of the waste hierarchy giving top priority to preventing waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal (e.g. landfill) as illustrated in figure 2.

To help achieve North Herts net zero targets, development proposals should seek to minimise the amount of waste from new development going to landfill. This can be achieved by working closely with the Council to deliver innovative, efficient waste management systems that maximise waste recycling.

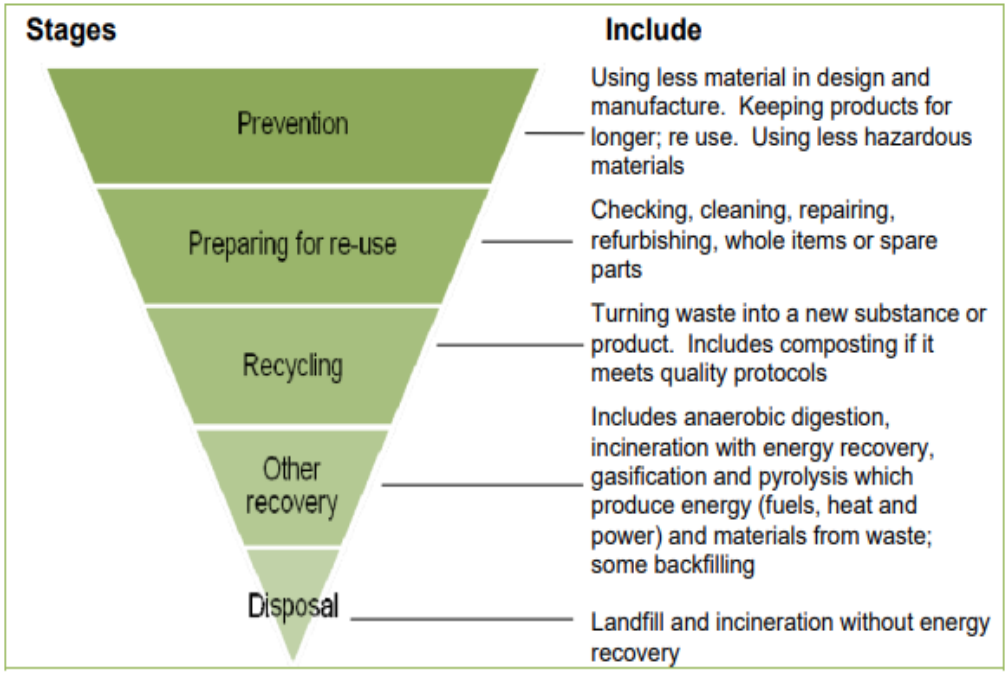


Figure 3 - The Waste Hierarchy (DEFRA)

Carbon Footprint

Construction and demolition activities are some of the largest

consumers of raw materials and produce substantial waste and emissions. Embodied carbon refers to the energy consumed in manufacturing, delivering, and installing the materials used to build, refurbish and fit-out a building, and its eventual decommissioning/ disposal at the end of its life. This includes emissions associated with fuel used to generate energy and those released in the production of materials like cement. In reduce embodied carbon development should be based on efficient design optimised to reduce loads to enabling leaner foundations and steel structures, reducing the

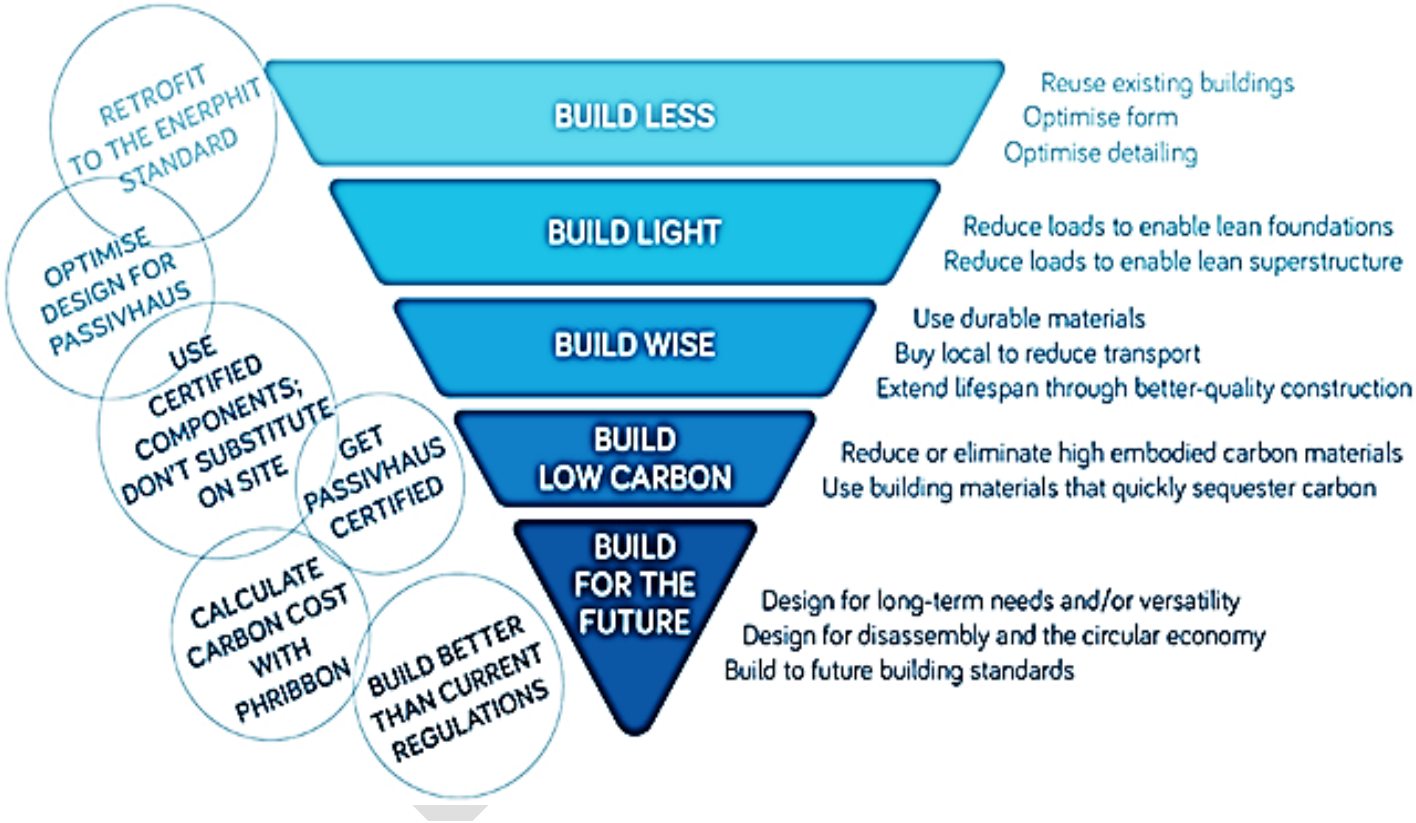


Figure 4 - Reducing embodies carbon (Passivhaus Trust)

cement content used, using alternative materials such as masonry instead of concrete blocks and clay fired bricks, using timber framing and specifying materials associated with lower carbon footprint. Additionally the design should consider factors such as durability and adaptability and the disassembly and re-use at the end of life.

New developments should incorporate circular economy practices and aim to achieve net zero waste as far as practicable. This can be achieved through modern methods of construction (MMC) and design for manufacture and assembly (DfMA)[6] processes and following the waste hierarchy. It is also important to consider the lifetimes of the various elements or 'shearing layers'[7] of buildings. Elements with the shortest lifetimes (e.g. finishes, and furnishings) should ideally have minimal negative environmental impacts and embodied carbon so they can be renewable. Elements with longer lifetimes (e.g. building structures) may require more embodied carbon, but their associated negative environmental impacts may be minimised by designing these layers for the greatest degree of durability[8].

In summary achieving low/ zero embodied emissions will require:

- Optimising design with the aim of reducing the raw materials used through design optimisation and the use of low/ zero carbon products.
- Reuse: utilising recycled materials, re purposing of existing buildings/ structures and designing buildings for deconstruction and re-use.
- Sequestration: incorporating measures to sequester carbon and using alternative material such as wood or recycled concrete products. For example, substituting wood for steel and concrete has the potential to greatly reduce the GHG impact of buildings, especially if the wood structure can be salvaged at the end of its life and reused. Also landscaping can be designed to sequester carbon through appropriate planting.

Operational Carbon

Operational carbon refers to the amount of carbon emissions associated with the building's annual operation. This includes electricity, gas and other fuels used in a building for heating, cooling, ventilation, lighting, hot water, appliances, and computer servers in commercial premises. Developers are encouraged to follow a fabric first approach such as LETI or Passivhaus standards, aiming for net zero carbon; where energy on an annual basis would be zero or negative. For the operational carbon emissions of a building to be zero, it must be highly energy efficient and powered by renewable energy either on or off-site, with any remaining annual carbon

[6] A design approach focussing on optimised design based on off-site pre-fabrications of elements such as floors, slabs and columns for on-site construction. This can lead to less waste generation and a reduction in vehicular transport of materials to site.

[7] Term coined by architect Frank Duffy, the "shearing layers" concept defines buildings as a set of integral components that adapt or change in different timescales.

[8] Reference: Stewart Brand, 1994, 'How Buildings Learn: What Happens After They're Built'. Viking Press.

emissions offset. Further information is provided in the draft Hertfordshire Development Quality Charter.

Whole life carbon

Whole life carbon (WLC) emissions are the total carbon emissions resulting from the construction and the use of a building over its entire life, including its demolition and disposal. They capture a building's operational carbon emissions from both regulated emissions (due to fixed building services, as defined in the Building Regulations such as lighting, heating, hot water, air conditioning and ventilation) and unregulated energy (e.g. emissions relating to cooking and electrical appliances), as well as its embodied carbon emissions (emissions associated with raw material extraction, the manufacture and transport of building materials, and construction; and the emissions associated with maintenance, repair and replacement, as well as dismantling, demolition and eventual material disposal). A WLC assessment also includes an assessment of the potential savings from the reuse or recycling of components after the end of a building's useful life. It provides a true picture of a building's carbon impact on the environment. British Standard BN EN15978 sets out principles of embodied and whole life carbon measurement in the built environment (Figures 5&6). A template has been produced which applicants will be expected to include at the Pre application stage with updates at subsequent stages of the application process. This should demonstrate how the development will reduce overall emissions.

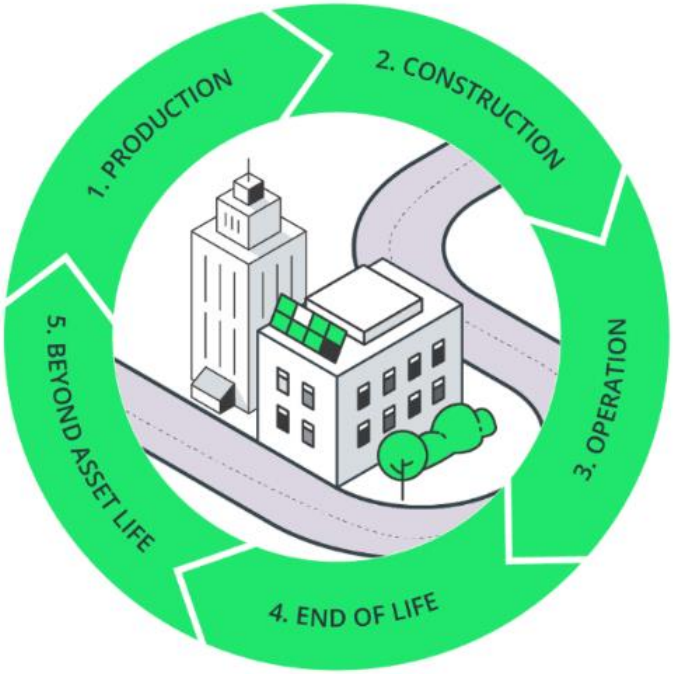


Figure 5 - Whole life carbon emissions

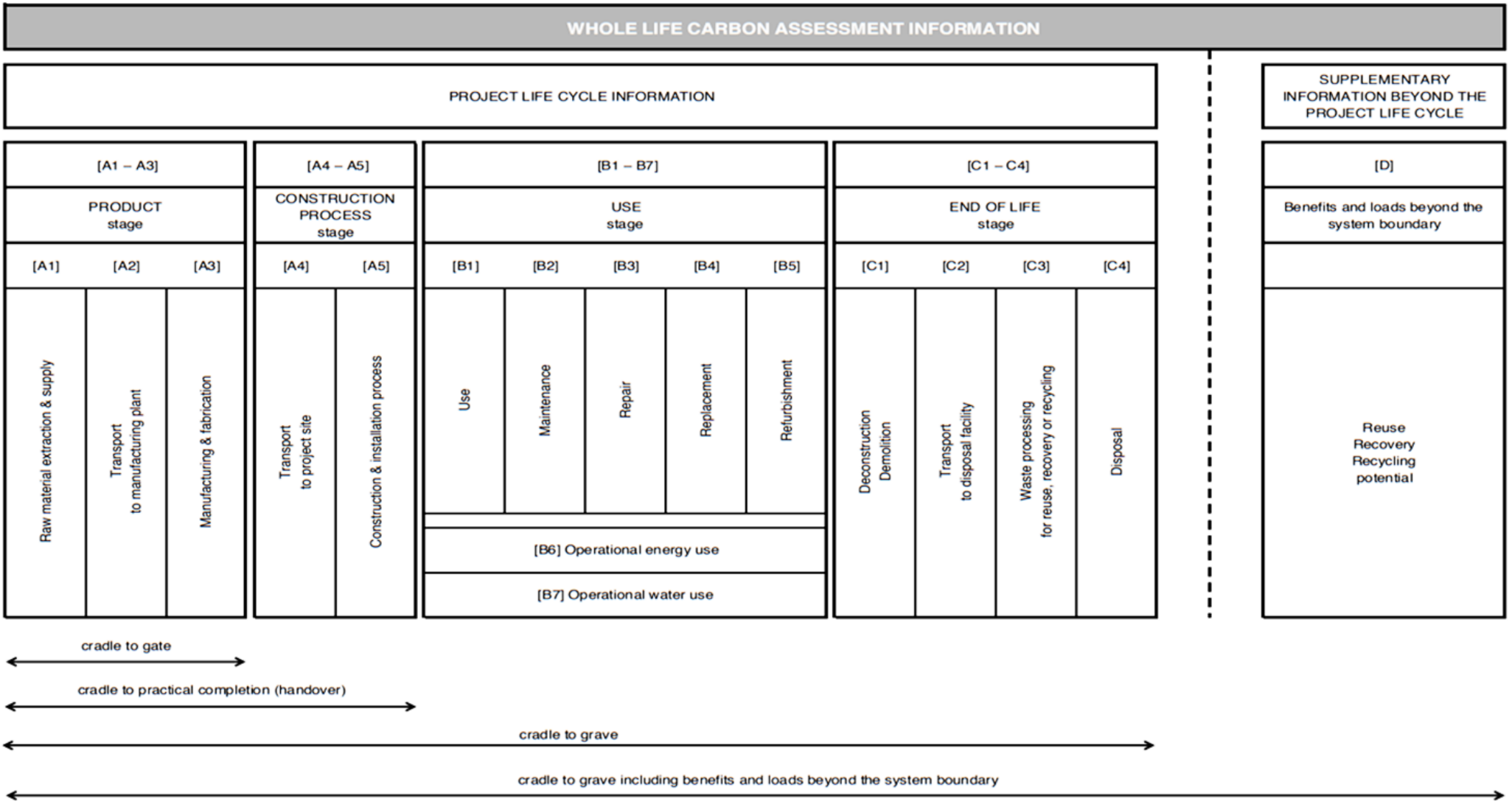


Figure 6 - Whole life carbon assessment (BS EN15978)

Land use & wildlife

North Herts has a wide range of habitats, including hedgerows, wildflower meadows, orchards, ponds, lakes, reed bed and fen, ancient woodlands, chalk streams and a wildlife corridor. Many of these habitats are within designated biodiversity sites, reflecting their value in terms of wildlife interest. These include national designations such as Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR), and local sites such as local wildlife sites (LWS). Additionally, in urban areas green spaces such as gardens, Churchyards, parks and allotments also provide valuable habitats that support a range of species and provide stepping stones for biodiversity.

The Environment Act 2021 introduced a requirement for planning applications to provide 10% Biodiversity Net Gain (BNG). It also established the requirement for Local Nature Recovery Strategies (LNRS); a new mandatory system of spatial strategies that will create a national system of interconnected sites for nature.

Residential and non-residential developments have the potential to produce detrimental effects on wildlife and biodiversity through encroachment and recreational disturbance. The NHLP seeks to address this by focusing growth within existing key settlements and utilising brownfield/ previously development land where possible. Where strategic development is allocated on greenfield land, the Plan includes policies seeking to mitigate potential adverse impacts on the environment. This is also part of the NHLP's vision which states '*the rich biodiversity and geodiversity of North Herts will have been protected and enhanced where possible. Where new development could potentially have an adverse impact on biodiversity and geodiversity, measures will have been taken to ensure that the impact was either avoided or mitigated*' and '*new green infrastructure will have enhanced the network of green corridors linking settlements to the open countryside, providing greater opportunities for healthy lifestyles*.' The Plan seeks to protect wildlife habitats and deliver biodiversity net gain. In this context the following strategic objectives are particularly relevant:

- ENV3 – Protect, maintain and enhance the District's historic and natural environment, its cultural assets and network of open spaces, urban and rural landscapes.
- ENV4 – Reduce water consumption, increase biodiversity and protect and enhance the quality of existing environmental assets by enhancing new green spaces and networks of green space for both recreation and wildlife.
- NE4 – Development to deliver measurable biodiversity net gain and to contribute to the restoration of ecological networks and degraded or fragmented habitats. Applicants are required to submit an ecological survey commensurate with the scale, location of development and its likely impacts on biodiversity demonstrating that adverse effects can be avoided and / or minimised according to the mitigation hierarchy. Net gains can be delivered through soft landscaping and tree planting to support wildlife habitats as identified in the Hertfordshire Biodiversity Action Plan.
- NE1 – seeks to protect the existing Green Infrastructure (GI) network and the creation of new strategic GI where appropriate**.** This is also the objective of SP12 which sets out a hierarchy of

designations and features, seeking to protect and enhance designated and non-designated biodiversity sites in accordance with their position within the hierarchy.

- NE5 and NE6 - seek to protect existing open space and support new and improved provision as part of new development schemes.

The District has a range of nationally and locally designated sites including 7 Sites of Special Scientific Interest (SSSI)[9], 9 designated Local Nature Reserves (LNRs) and over 300 designated Wildlife Sites (LWS). Additionally, there are watercourses including rare chalk stream habitats, woodlands, trees, parks and open spaces are interspersed throughout the District.

The presence, or potential presence, of any protected species such as bats and great crested newts, is a material consideration in planning application decisions. Similarly, there are priority habitats such as deciduous woodland and chalk grassland present within the District.

Proposals should avoid habitat loss and enhance the connectivity of ecological networks. The NPPF requires that development proposals follow the mitigation hierarchy (Figure 7).

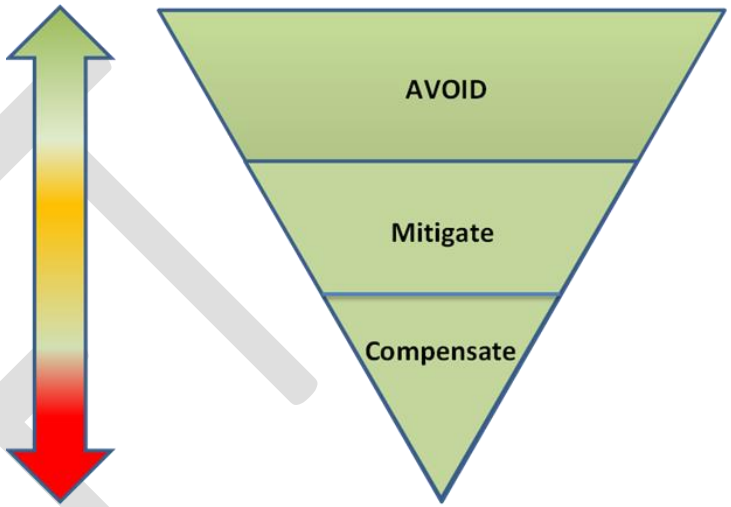


Figure 7 - The mitigation hierarchy

Therefore, it is important to ascertain if there are important habitats on the proposed site by carrying out an ecological survey of the site. Where important habitat is present, avoidance should always be the first consideration. It may also be possible to avoid harm to existing habitat through careful consideration of alternative siting, layout and scale of development such that the existing natural features that contribute to the biodiversity of the site are retained.

Where avoidance is not entirely possible, appropriate mitigation measures should be implemented. These should be commensurate to the scale of development and the importance and legal status of the habitat affected. Examples include the incorporation of planting to create buffer zones to reduce disturbance, implementing a

[9] These are shown on the NHLP policies map: Web Map - LocalPlan (north-herts.gov.uk)

permeable landscape design helping to reduce habitat fragmentation and linking to the existing GI network. This is further discussed in the 'Planning for Nature' guidance.[10], advice can also be sought from Hertfordshire Ecology.

Offsite compensation should only be considered as a last resort where avoidance and mitigation are not possible. This would involve the creation of offsite compensatory habitat according to a spatial hierarchy where local offsite delivery should be prioritised over delivery outside the District which should only be considered as a last resort.

NHLP policy NE4 states that all development should deliver measurable net gains for biodiversity. This requirement is set to a minimum 10% mandatory net gain in the Environment Act[11] calculated using DEFRA/ Natural England's Biodiversity Metric. This should be used early in the design process to evaluate the impacts of different design options. Applicants are required to submit a biodiversity gain plan setting out how a development will deliver biodiversity net gain. This should cover the following:

- How adverse impacts on habitats have been minimised
- The pre-development biodiversity value of the onsite habitat
- The post-development biodiversity value of the onsite habitat
- The biodiversity value of any offsite habitat provided in relation to the development
- Any statutory biodiversity credits purchased; plus
- Any further requirements as set out in secondary legislation.

The biodiversity net gain process is illustrated in Figure 9 Biodiversity net gain can be achieved through measures that serve to provide space for biodiversity and create links to local and/ or strategic habitat networks. Good practice examples include the following elements:

- Incorporating wildlife corridors connecting through the development. The design of the development should not interrupt or block wildlife networks;
- The creation of community woodland within development schemes on greenfield sites where appropriate;
- Community food growing projects, community gardens and allotments;
- Green roofs/ walls and water features;
- Incorporating wildflowers to support pollinators;

[10] Hertfordshire Local Nature Partnership – Planning for biodiversity and the natural environment in Hertfordshire – guiding principles.

[11] This requirement is expected to come into force in January 2024 for all but exemptions and small sites (residential development of less than 10 dwellings or site area less than 0.5 ha or less. For non-residential development: less than 1000 m_2 of floorspace or sites smaller than 1 ha). The transition period for small sites has been extended to April 2024.

- Including flowering lawns to provide forage for bumblebees;
- Housing for wildlife: bat boxes, bird feeders, insect hotels, insect hibernation houses;

Figure 8 - Examples of housing for wildlife

- Retaining native planting, trees, orchards, hedgerows, newt ponds and streams; and
- Sustainable drainage systems to manage surface water, filter out pollutants in surface water run-off an provide habitats for wildlife.

The Council already require a Preliminary Ecological Appraisal or Ecological Impact Assessment to be submitted with most types of planning applications. These are required to contain a specific section entitled 'Biodiversity Net Gain' (BNG) which must clearly show how the site has been assessed using the Biodiversity Metric (latest version). This will demonstrate the baseline habitat value of the site (pre-development) and the post development habitat value. It is also required to demonstrate how compliance with the BNG 10 good practice principles[12] has been applied as part of the net gain assessment. Further details regarding evidence and reporting requirements is provided in NHDC's Developer contributions SPD.

Herts Local Nature Recovery Strategy

The Government's 25 Year Environment Plan which includes provision for a Nature Recovery Network (NRN) states that recovering wildlife will require more habitat, in better condition and in bigger patches that are more closely connected. As well as helping wildlife thrive, the NRN should be designed to bring a wide range of additional benefits such as:

- greater public enjoyment;
- pollination;
- carbon capture;
- water quality improvements and
- flood management.

Further information pertaining to important habitats and species within the District is provided in the Hertfordshire Biodiversity Action Plan and the Herts Environmental Records Centre (HERC). Further guidance is provided by The Herts Local Nature Partnership (LNP). The BNG Process is illustrated in Figure 9 below.

[12] Biodiversity-Net-Gain-Principles.pdf (cieem.net)

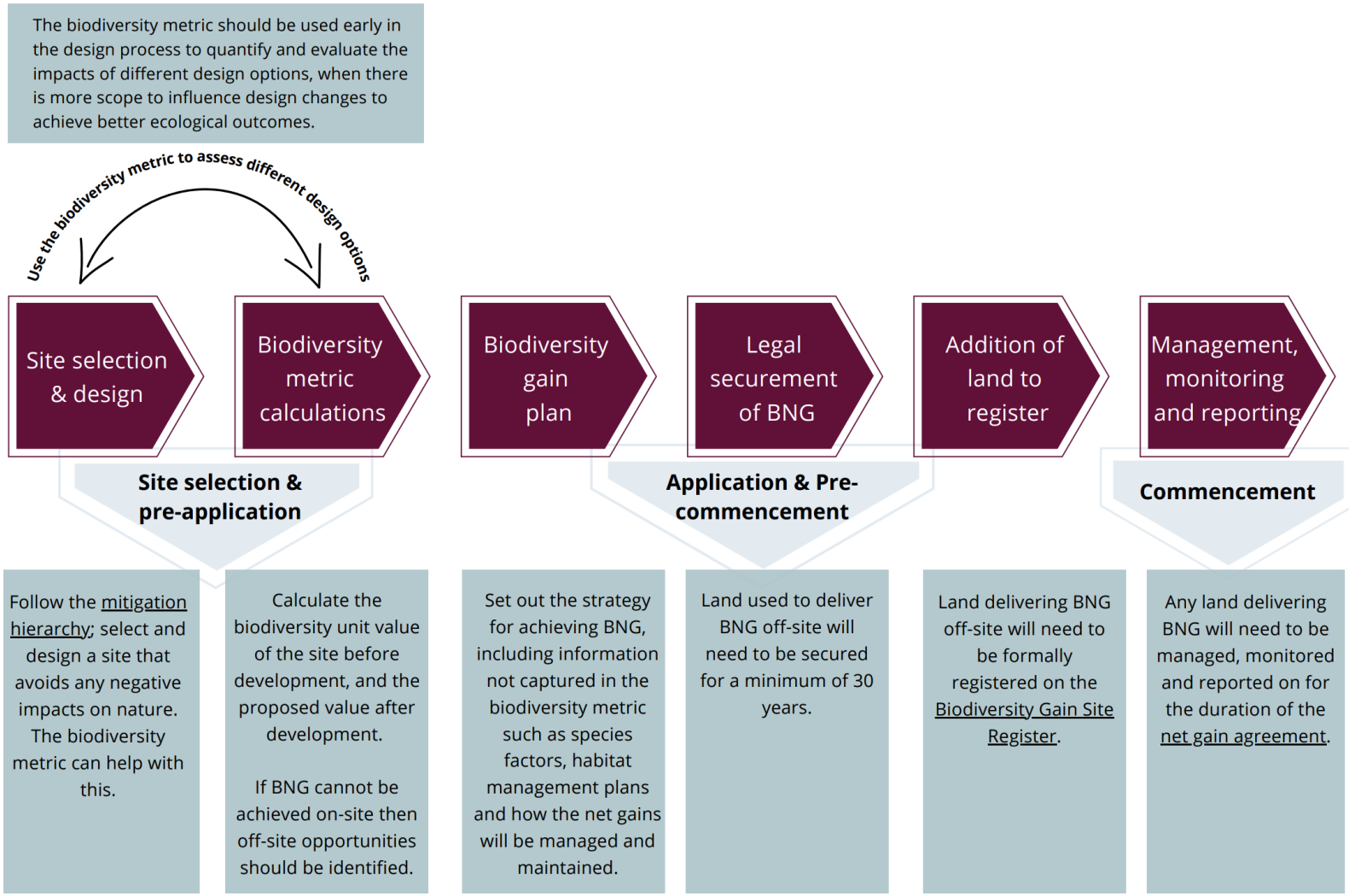


Figure 9 - The BNG process (Natural England)

Protecting Chalk Streams & Rivers

Development schemes in the vicinity of water bodies can help improve the quality of river habitats through restoration projects to restore internationally important chalk streams in the District. This will benefit wildlife and improve resilience to climate change as droughts become more frequent. This can be achieved for example by reversing historic drainage works to restore naturally meandering channels which reconnect rivers and streams surrounding floodplains[13]. Developers should seek to integrate and enhance natural water courses though sympathetic design aimed at protecting and enhancing the quality of watercourses and harnessing the recreational opportunities they offer where appropriate. This should include the identification of opportunities for de-culverting to enhance heavily modified water bodies[14]. Furthermore, tree planting to enhance tree cover along water courses serves to provide shade and reduce temperatures so that river habitats and species can survive increasingly hot summers.

[13] Example case studies can be found here https://environmentagency.blog.gov.uk/2023/06/15/working-to-improve-norfolks-chalk-streams/
[14] A Water Framework Directive designation

Checklist

	Bronze	Silver	Gold
Ecological Survey	Ecological Survey identifying any priority habitat, protected / priority species establishing potential impacts. (BS42020 or DEFRA Biodiversity Metric)	Wildlife housing for bees/ bats, Newt ponds Creation of Wildlife networks	Links to strategic GI network
Management plan outlining mitigation and monitoring measures	Management plan outlining mitigation and monitoring measures	Management plan also includes measures to enhance existing habitat and biodiversity where appropriate.	In addition management plan includes restoration of natural river/ waterbody courses or seeks to enhance waterbody quality where appropriate
Biodiversity Net gain plan	Biodiversity Net gain reporting (as per HNC Developer Contributions SPD) demonstrating 10% BNG	Greater than 10% BNG	Over 30% BNG
12m complimentary habitat buffers around locally and nationally designated sites.	12m complimentary habitat buffers around locally and nationally designated sites.	LWS Enhancement strategy (where appropriate/ applicable) In addition to standard requirements	Conservation/ enhancement to Nationally Designated site (where appropriate/ applicable) In addition to standard requirement
Open space provision/ enhancement and maintenance/ management plan	Open space provision/ enhancement and maintenance/ management plan	Open space provision also seeks to: Enhance nature depleted areas and; Includes features to enhance to biodiversity e.g. such as copses, ponds, ditches, rough area.	Open space sites link to local and / or strategic green corridors (GI) seeking to compliment the Nature Recovery Network by providing habitat connectivity.

Culture and Community

The NPPF recognises that planning plays a role in facilitating social interaction and creating healthy, inclusive communities. Community and recreation facilities, together with green spaces play an important role in enabling people to participate in physical and cultural activities which can help enhance physical, spiritual and mental wellbeing and engender a sense of inclusion and community. It can also reduce crime and create a sense of place enhancing the overall attractiveness and vitality of neighbourhoods. NHLP Policy HC1 seeks to protect existing community facilities and supports the provision of new ones; subject to proposals meeting the criteria set out in the policy. New development should aim to achieve socially, economically and environmentally sustainable communities. Policy SP10 supports the retention of existing community, cultural, leisure, health, education and local retail facilities and the provision of new ones in new development.

It is important for new development to relate to the local heritage and cultural context, both in terms of the built environment and the landscape. Development should conserve and enhance (where appropriate) the significance and setting of local heritage assets and reflect the local vernacular, historical building typologies, the treatment of facades, materials, and architectural styles.

Health and Wellbeing

The built environment has multiple and significant impacts on people's health and wellbeing (Figure 10). It needs to feel safe and secure for all, including the more vulnerable members of the community. It can also positively influence behaviours and lifestyles of residents addressing multiple objectives such as

- improving safety,
- reducing air pollution,
- maximising environmental protection,
- or securing infrastructure investment to attract new residents and a skilled workforce.

Developers and delivery partners are expected to engage health, sport, and physical activity consultees early in the development process to maximise the health and wellbeing benefits of their designs.

The NPPF emphasises the planning system's role in achieving healthy places that enable healthy lifestyles through the provision of accessible green infrastructure, sports facilities, and layouts that encourage walking and cycling. This is echoed in HCC's Green Infrastructure Strategy and NHLP Policy SP9 which seek the provision of accessible, multifunctional GI that supports healthy lifestyles. The Hertfordshire Climate Change and Sustainability Partnership's (HCCSP) Strategic Action Plan for Biodiversity includes several actions seeking to enhance green infrastructure, green space provision and nature based solutions to enhance biodiversity and improve community health.

The NHS's 'Putting Health into Place'[15] sets out principles for designing, delivering, and managing healthy places. The following principles are of relevance to designing healthier developments:

- **Create compact neighbourhoods**: new schemes should facilitate social and economic connections by designing compact, walkable, mixed-use neighbourhoods with distinct identities. Neighbourhoods that do not rely on cars, with attractive streets, parks and community spaces facilitate social interaction and engender beneficial effects on health and wellbeing. Commitment to creating compact neighbourhoods is needed at the earliest stages of planning and development. This should be implemented through a master planning approach informed by the National Model Design Code and NHS England's Healthy New Towns guidance[16].

- **Maximise active travel:** well-planned neighbourhoods can make walking, cycling and affordable public transport the preferred choice for getting around. Providing appropriate, accessible, infrastructure for whole journeys makes active travel options practical for users. Development should incorporate networks of safe walking and cycling paths with clear signposting, seating and cycle-parking These should link to the wider surroundings, schools, health and local centres. The provision of trails incorporating active play, heritage and nature walks also encourages active lifestyles.

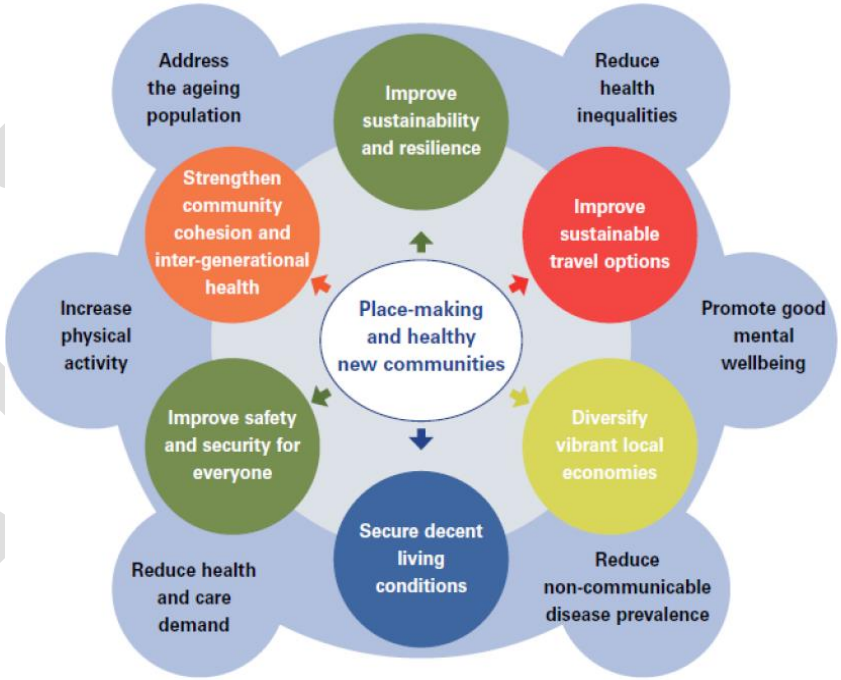


Figure 10 - Multi benefits of place making and healthy communities (TCPA)

- **Foster health in homes and buildings:** Provide healthy homes and buildings that are efficient and resilient to climate change. Homes should be designed to have sufficient space (meeting or exceeding Nationally Described Space Standard), daylight levels, ventilation, outlook and privacy. Buildings that are comfortable, offer character and cultivate a sense of community and pride have a positive impact on people's health.

[15] NHS England Putting Health into Place – Principles 4-8 Design, Deliver and Manage

[16] See Northstowe, Cambridgeshire

- **Enable healthy play and leisure:** Development should create opportunities for people of all ages and abilities to come together, be active and enjoy leisure time.

It is important to recognise that some sections of the community face barriers in accessing green spaces and nature (Public Health England, 2020). People living in the most deprived areas, and ethnic minorities are disproportionately affected by high levels of pollution and people in the least deprived areas of England generally enjoy significantly more accessible green space than those in more deprived areas[17]. It has also been shown that, across the older population, a higher percentage of males are active than females[18]. Girls and young women often report feeling unsafe when spending time in public spaces such as parks and green spaces[19] (Figure 11). Development proposals should ensure that nature and landscape are woven into scheme design and careful consideration given to access, visibility, and lighting in order to improve passive surveillance and reduce crime. It is important to consider how people use space, for example women generally feel safest in well-used spaces, obscure, isolated areas create situations of vulnerability. Ensuring that streets, paths and public spaces are well overlooked yet deliver privacy to individual dwellings giving the impression of a high degree of passive surveillance is also helpful in discouraging crime and creating a sense of safety. The inclusion of sensory areas and provision of talking/ tactile maps can help make green spaces more accessible to people with sight impairment.

[17] JSNA Lite Bite: Wider Determinants of Health (Nov. 2022)
[18] Hertfordshire Cohort Study
[19] Out of Bounds – Equity in Access to Urban Nature

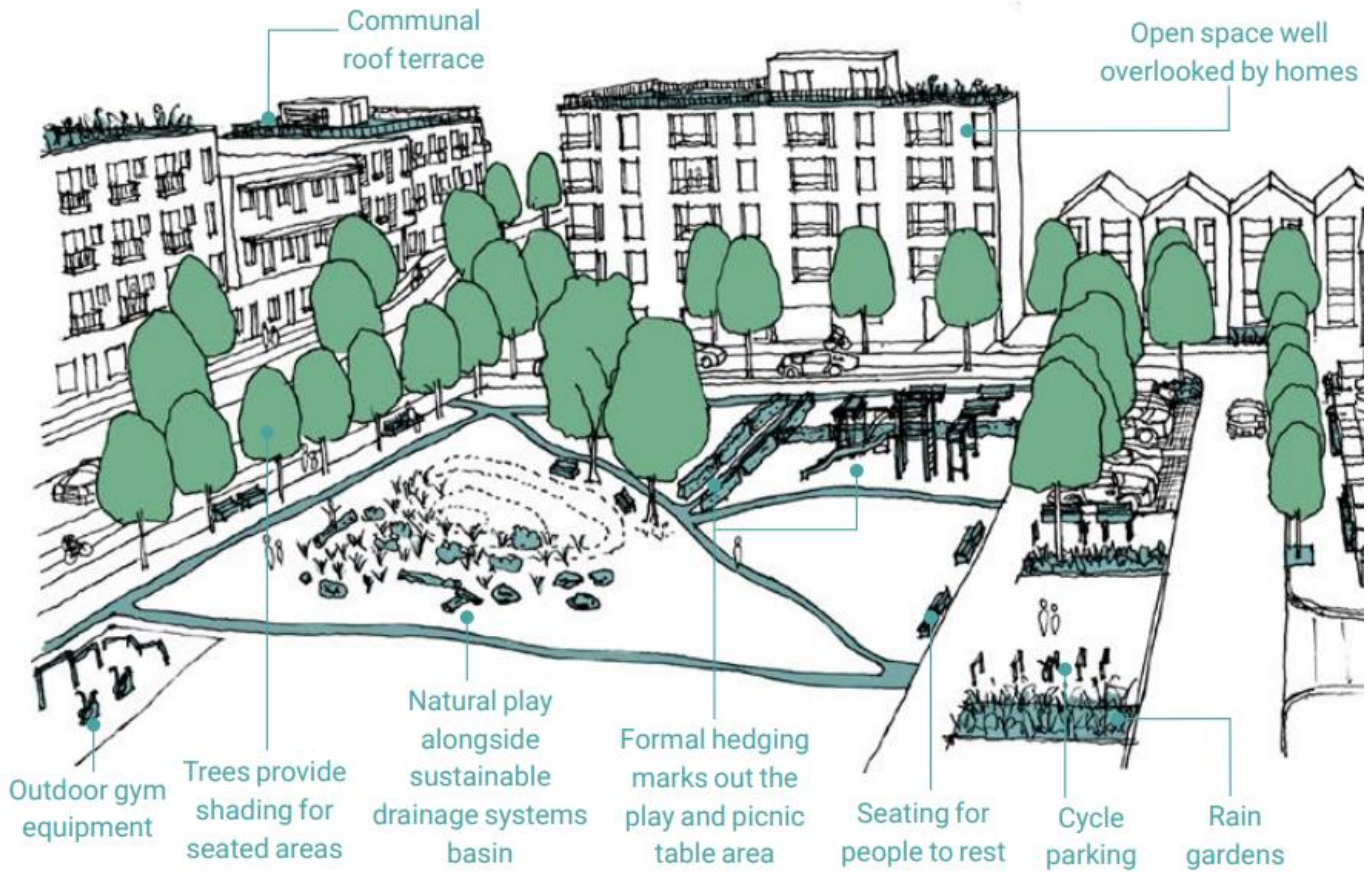


Figure 11 - High quality, green open spaces and play areas (Source: National Design Guide)

3 Technical and General Guidance

This section provides general overview and technical guidance of topics relevant to achieving sustainable building design. This requires a holistic approach to the design, construction, operation and maintenance of buildings that seeks to minimise their environmental impact and creates a healthier and more comfortable environment for occupants. Sustainable building design principles include:

- Using energy-efficient materials and appliances which can help reduce the amount of energy needed to heat, cool, and light a building.
- Designing for passive solar heating and cooling through spatial planning and orientation which can help reduce the need for active heating and cooling systems.
- Using renewable energy sources which can help reduce reliance on fossil fuels.
- Water conservation which can be achieved through features such as rainwater harvesting and greywater recycling.
- Indoor air quality which can be improved through features such as ventilation and filtration systems.

Passive Design and Energy Efficiency

- Sustainable materials that are recycled, recyclable /adaptable for future reuse, or sustainably sourced.

Site Layout and Design

Passive design uses layout, fabric, and form to reduce or eliminate mechanical cooling, heating, ventilation and lighting demand. All new developments should consider optimising efficiency using passive design systems during the design phase. Whilst 'active' systems such as solar panels and other renewable energy technologies play a part in reducing carbon emissions, 'passive' measures are usually less expensive

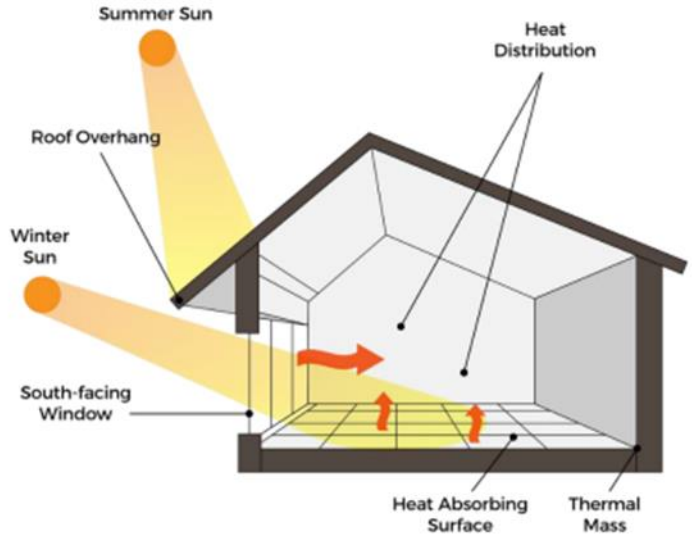


Figure 12 - Passive solar heating

Where possible, taller buildings should be placed towards the northern section of a site to reduce the effect of shadowing across the site – but this should not be done in a regimented or artificial manner and should be applied where it will provide overall benefits. Similarly, parking facilities such as garages can usefully be placed towards the north of buildings for similar reasons, provided they don't harm the amenities of neighbouring sites and land uses.

The spacing of buildings on sites should also be considered to strike a balance between gaining an optimum level of natural heat and light, including also considering efficiencies of reduced loss of heat through compact development, whilst avoiding contributing to the Urban Heat Island Effect in locations where this might be an issue.

Where the topography of a site allows, the best use should be made of opportunities for building into slopes or into the ground, where this can offer thermal buffering and the exploitation of ground heat. This can also offer protection to buildings from harsher weather conditions, allowing for adaptation to climate change. However, as sites are configured to allow for optimum benefit from the sun's power and for adapting to climate change, the siting of solar photovoltaic panels and arrays on buildings in the vicinity of the site also need to be taken into account (in the same way as neighbouring amenities) and this may therefore inhibit the preferred choice of design/layout for the new development. Nonetheless, passive gains for a new development at the expense of the ability of established sites to run sustainably will not be acceptable, and this will need to be factored into the calculations for designs.

Building Orientation

On all development sites, but particularly larger sites, developers will be expected to demonstrate that consideration has been made as to how buildings are arranged for maximum natural energy and cooling, as well as associated health benefits.

In residential developments where there is an east-west axis, the orientation of dwellings will maximise solar gain on the south elevation. With such a site orientation, habitable rooms are best located on the south elevation with kitchens and bathrooms located on the north side. Such orientation will maximise heating from the sun in the winter, but this would need to be balanced with the risks of overheating in the summer when shading may be required either from trees or other forms of planting, or from louvres.

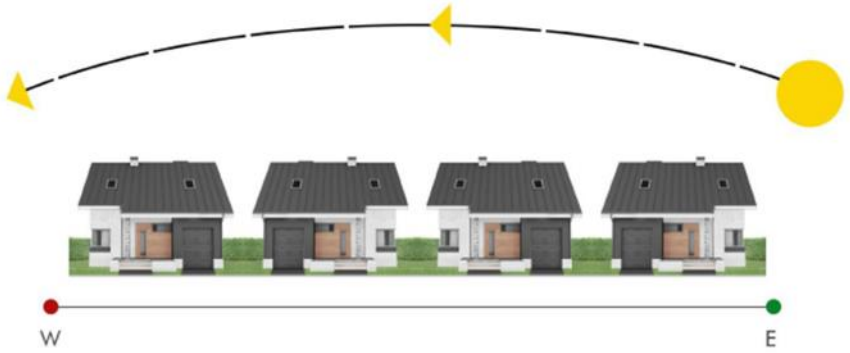


Figure 13 - Optimal orientation maximising solar gain

On sites with a north-south axis, the orientation of the buildings will maximise heating in the morning and evening when it is most needed. This layout also helps to reduce overshadowing between buildings due to the angle of the sun's path. Habitable rooms, including living rooms and bedrooms, would best be located on the west elevation to maximise the heating and lighting effects from solar gain later in the day.

Figure 14 - Maximising passive heating on a north-south oriented site

Thermal Mass

The choice of building materials will have an important bearing on how temperatures are moderated in a building. High thermal mass materials absorb heat during the day and release it during the night, helping to regulate the temperature within the building. Materials that have a high thermal mass include brick and block with plaster finishes, whereas timber framed buildings have a lower thermal mass (though this can be weighed against the benefits of lighter insulated materials and modern constructions methods in reduced embodiment of carbon, and it is for the developers to determine the merits of each for energy efficiency and reduced carbon emissions). Choice of materials will depend upon the scheme, but the embodied carbon will need to be considered.

Thermal mass is a design feature, not a method of insulation. It can reduce the cooling load of a building in summer and the heating load in winter, therefore reducing carbon emissions.

In the summer, thermal mass helps prevent buildings from overheating by absorbing heat from the sun and from the building's occupiers, rather than heating the building's interior. In an office building, for example, the peak internal temperature is usually in the afternoon, particularly in the summer when the building is occupied, and heat is being generated from the occupants, computers, and lighting. At night when the building is vacated, the heat diminishes, external temperatures fall, and heat is released from the thermal mass of the building. This absorption of heat by the building's fabric and its release at night will help reduce the need for air conditioning, reducing energy consumption and carbon emissions.

In the winter, as in the summer, during the day the building absorbs heat but at night the thermal mass prevents the building from getting cold. This reduces the amount of energy needed to heat the building the following day to bring the building up to an appropriate

temperature, thereby minimising carbon emissions and saving energy.

Wind Driven Ventilation

Wind driven ventilation utilises pressure differences that occur when air flows over a building. The appropriate placement of ventilation openings will draw air through the building openings thereby providing natural ventilation.

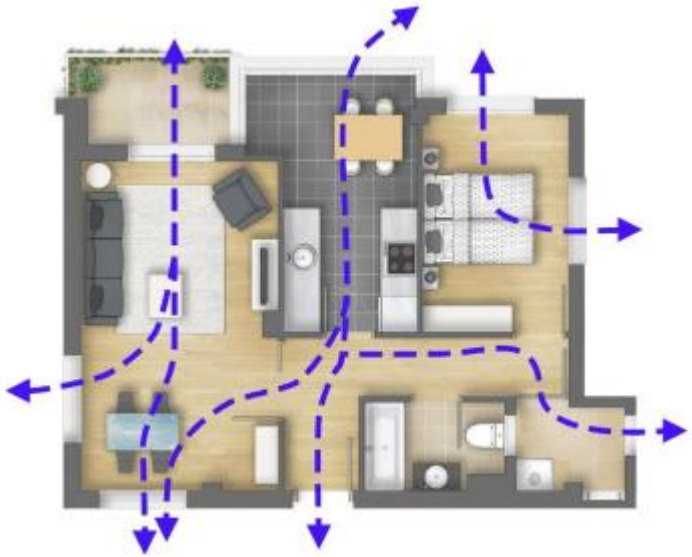


Figure 15 - Wind driven ventilation

Passive Stack Ventilation

Passive stack ventilation is driven by differences in internal and external temperatures and is achieved by placing ventilation openings at different heights. It is based on the 'stack' effect whereby warm air naturally rises and is replaced with cooler air entering at a lower level. In order to make a passive stack approach work, vents should be placed in rooms which require fresh air to replace moisture-laden or odorous air. Ducts draw the warm air up and out of the building, and ventilation openings (such as trickle vents in winter or open windows in summer) draw in fresh air from 'dry' rooms.

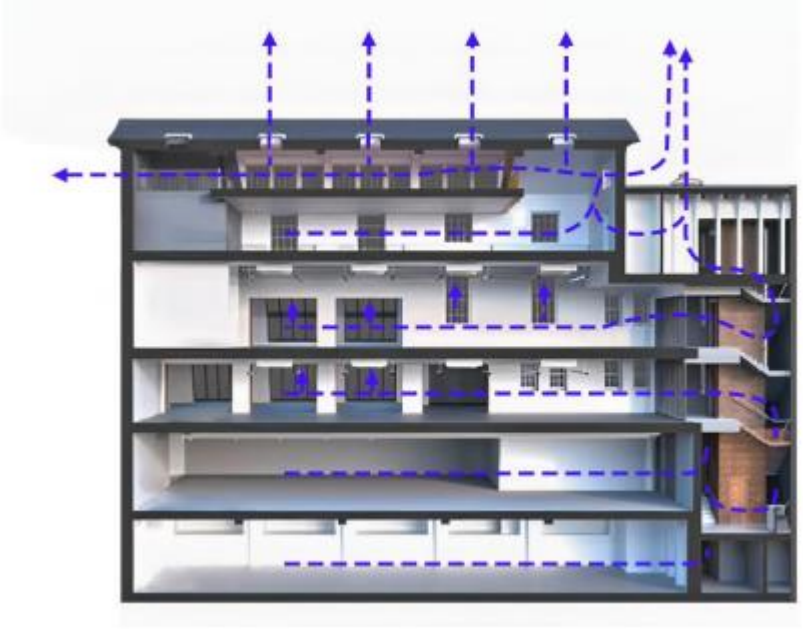


Figure 16 - Passive stack ventilation

Insulation

Around half of the heat lost in a typical home is through the walls and roof spaces. Increasing insulation levels significantly beyond current building regulations requirements is the cheapest and most effective method of reducing CO_2 emissions, and energy needs. It requires minimal maintenance and should last the life of the building. It reduces heat losses and gains through the fabric of the building and minimises the costs of heating and cooling systems. Buildings are kept warmer in the winter and cooler in the summer. Insulation measures include:

- Loft insulation;
- Tanks and pipe insulation;
- Cavity wall insulation;
- Solid wall insulation;
- Floor insulation;
- Draught proofing; and
- Double and triple glazing.

However, as with all measures, this should be weighed against other design considerations. In particular, the use of solid wall insulation should be avoided where this can affect the appearance of traditional brickwork and tile-hangings.

Thermal insulation is measured using 'U values'. The U value is a measure of how readily heat will flow through the structure. The lower the U value, the less heat is transferred through the fabric of the building. An increased thickness of insulating materials will increase energy efficiency and reduce the U value. More information on home insulation can be found at the Energy Saving Trust.

Airtightness

Significant reductions in heat loss can also be achieved by reducing air infiltration through the building fabric and making the building air tight. Air leakage occurs in several places, particularly draughty windows and doors and joints between ceilings and walls. This can be reduced through careful construction practices, to ensure gaps in the fabric are minimised (Figure 17).

Figure 17 - Energy loss through a building

Measures include:

- Ensuring gaps around window and door frames are properly sealed;
- Draught-stripping external windows and doors (other than bathrooms unless other ventilation measures are included);
- Using controlled ventilation in kitchens (with draught-stripping);
- Sealing holes around services passing through the external walls including water pipes, gas pipes, boiler flues and electrical cables;
- Choosing airtight light fittings, or sealing gaps around light fittings and ceiling pull cords;
- Sealing the joint between the ceiling and the external wall; and
- Sealing the joint between the dry-lining and the skirting board.

Solar Gain and Overheating

Whilst reducing energy needs – and associated carbon emissions - through retaining as much heat as possible is important, this does nonetheless need to be balanced against the issue of overheating, which in the built environment is also a growing issue; twenty per cent of homes in England already experience overheating in the summer months, and with temperatures rising, this should be addressed in advance through appropriate measures. The UK's Climate Change Risk Assessment identifies high temperatures and the threat this poses to health, wellbeing and productivity as one of the six priority risk areas for action.

Properties at a higher risk of overheating include:

- Flats with south and west facing facades due to excess solar gain;
- Top floor flats with heat gain through the walls and roof;
- Single aspect flats (no cross-ventilation allowance);
- Properties with district heating or similar, where excess internal gains arise from poorly placed or poorly insulated pipe work;
- Buildings with heat recovery systems that have no summer bypass mode; and
- Buildings with poorly designed thermal mass coupled with insufficient secure ventilation to enable night purge of heat to take place.

Air conditioning is commonly used to address overheating, but this is energy intensive with high associated levels of carbon emissions. It also places a cost on future occupiers in terms of both energy bills and maintenance costs. Therefore, the Council's preferred approach to overheating is that the design of developments should follow a 'cooling hierarchy', subject to taking a balanced approach to this and other design considerations.

The cooling hierarchy is as follows:

- **Passive design** - Minimise internal heat generation through energy efficient design and reduction of the amount of heat entering the building in the summer and shoulder months through consideration of orientation, overhangs and shading, albedo, fenestration, insulation, and green roofs. Where heat is to be managed within the building through external mass and high ceilings, provision must be made for secure night-time ventilation to enable night purge to take place.

- **Passive/natural cooling** - Use of outside air, where possible pre-cooled by soft landscaping, a green roof or by passing it underground to ventilate and cool a building without the use of a powered system. This includes maximising cross ventilation, passive stack and wind driven ventilation and enabling night purge ventilation. Single aspect dwellings should be avoided for all schemes as effective ventilation can be difficult or impossible to achieve. Windows and/or ventilation panels should be designed to allow effective and secure ventilation.

- **Mixed mode cooling** - Use of local mechanical ventilation/cooling to supplement the above measures (in order of preference):

    i. Low energy mechanical cooling (e.g. fan powered ventilation with/without evaporative cooling or ground coupled cooling).

    ii. Air conditioning – last resort as these systems are energy intensive.

Full building mechanical ventilation/cooling system - Use only the lowest carbon/energy options once all other elements of the cooling hierarchy have been utilised.

Glare

In addition to solar gain, it is also important to consider the potential effects of glare at the design stage. As with overheating this can be addressed through effective layout and design and the inclusion of effective solutions such as low eaves-height blinds; brise soleil screening; external shuttering; lighter colour palettes; and the use of photochromic/ thermochromic glass, to be selected with consideration of other design matters, such as local distinctiveness and character.

On-Site Low Carbon and Renewable Energy

With the transition away from traditional gas boilers major schemes should consider implementation of on-site low carbon and renewable energy generation systems.

Applicant should therefore submit a sustainability statement outlining details of on-site low carbon and renewable energy generation systems.

Solar Photovoltaic Panels

Solar photovoltaic technology converts the energy from the sun into electricity. The greater the intensity of light, the greater the generation of electricity, meaning that solar panels are often located on south facing roofs[20] or amounted on flat roofs as an array. While solar panels can be visually intrusive, careful placement can avoid or limit impact. It is also possible to buy solar panels which mimic the design of roofing tiles.

By connecting a PV system to the National Grid, the surplus daytime electricity that has been generated can be sold to the local utility provider, who would supply electricity outside of daylight hours. At least 10m2 of PV is needed.

PV products can be used on all types of roofs - even flat ones, though the optimal roof angle is 30º to 40º in the UK.

A north facing PV roof will generate 60% of the amount of electricity that a south facing roof would.

Solar panel installations (both PV and thermal) can be sited anywhere – including free-standing in the garden or on the roof of a property, garage or outbuilding – as long as it does not regularly get overshadowed.

Recent technological advancements in this field have led to the development of solar tiles and transparent solar PV. These are more discreet options than traditional solar PV, which provide more opportunities to improve a building's energy efficiency. These technologies are particularly relevant for listed/historic buildings, which may experience more difficulty when looking to install traditional solar PV.

PV tiles can be used as a roof covering and are maintenance free. The PV tiled roof of a house could prevent 34 tonnes of greenhouse gas emissions during its lifetime.

PV tiles cost at least £500 per m2, but they do act as a roof covering, save money on electricity and surplus energy can be sold.

Solar panels do not generate any noise, have no moving parts and in general have a long life with low maintenance making them an ideal approach in most urban and rural locations. The economic viability is however only realised over a long period.

[20] While overshadowing will reduce energy production only daylight is required to generate electricity and not direct sunlight, meaning that it will continue to operate throughout the year and on cloudy days.

Solar Thermal Heating

Solar thermal systems use sunlight to heat a fluid (depending on the application, it can be water or a water/glycerol mixture).

Two main types of solar hot water collector are available: Flat plate and evacuated tube. In both systems water or an antifreeze mixture travels through the collector picking up heat from the sun and then passing through a copper coil in the hot water tank. Solar panels work best when located in direct sunlight on a sloping roof. Care needs to be taken to make sure that the panels are not overshadowed. A well designed system can provide between 50 and 70% of a household's annual hot water with the peak period being between May and September. In the winter the water can be fully heated to the required temperature using a conventional boiler.

The necessary equipment does not generate noise and requires little maintenance but does require an area of south facing roof where it is possible to access the existing water heating system. Solar water heating systems can often be designed discretely into new buildings.

Solar Photovoltaic – Thermal

Solar thermal units heat water which is integrated to a building's hot water system using a heat exchanger or colocation. These systems operate by harnessing sun light to heat a fluid in a solar roof panel which circulates through the system and heats the water tank. This preheats the water, reducing the amount of other energy needed from elsewhere to heat the water.

Solar Water Heating systems are most effective in large family homes and large building complexes where large quantities of hot water are needed. Systems can supply up to 50% of hot water use.

Relevant legislation

Whilst the installation of solar panels on residential buildings may be 'permitted development' in certain circumstances, wildlife legislation still applies as follows:

- All species of bat and their roosts are protected under both the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended).
- All wild birds are protected by the Wildlife and Countryside Act 1981 (as amended), which protects the birds themselves, their eggs and nests whilst being built.

Raised slates/tiles provide suitable opportunities for roosting bats as well as nesting birds, fitting solar panels may cause harm or disturbance to them. Other retrofitting options such as cavity wall insulation, solar thermal, externally applied solid wall insulation, roof insulation at rafter level and timber casement window draught proofing may also affect ecology, as such the potential presence of protected species requires careful consideration. If retrofitting is planned within or adjacent to known nesting swift sites, then extra caution will be required.

To avoid breaching wildlife legislation, a bat scoping and nesting bird inspection should be undertaken. These surveys should inform the timing of works in order to avoid disturbing roosting bats if present

and necessary licensing requirements. Further advice can be sought from the Bat Conservation Trust which is free of charge or if planning consent is required, from the Council's planning advice/pre-application service. In addition, the broad location of known swift nesting sites can be found on the I Share Maps website (detail provided at Postcode level).

Heat Pumps

Heat pumps work by extracting heat from a source outside the building and concentrating it to heat the home. This heat can come from the ground, the outside air or even a nearby body of water. Heat pumps are electrically driven and are normally most efficient when the increase in temperature is minimised. They work well with underfloor heating systems which operate at lower temperatures. Heat pumps are best used with a well-insulated new build property or an existing dwelling undergoing major refurbishment. They are particularly well suited to homes in areas that do not have access to mains gas.

Ground Source Heat Pumps

Ground source heat pumps uses the stable high volume / low level warmth of the earth[21] and converts it into low volume / high level heat. The recovered heat can then be used to heat water or spaces.

There are two basic forms of ground source heat pump:

- The first comprises a bore hole where a long pipe is driven vertically down deep into the ground.[22]
- The second is a trench system, in which a loop or coil is laid out horizontally at a shallow depth.[23] In both systems, heat is transferred by water running through the pipe into a compressor which raises it to a usable higher temperature. Being almost entirely underground ground source heat pumps cause little or no visual impact.

Air Source Heat Pumps

Air source heat pumps work by converting the temperature of the outside air into heat for the building and supplying energy for the hot water system. The only outside space required is an external wall, making this system ideal for compact forms of development such as flats or smaller houses. They are cheaper to install than ground source heat pumps but these lower costs may be offset by the variability in air temperature.

Air source heat pumps are designed to work in combination with other heating systems rather than acting as the sole energy source and buildings must be sufficiently well insulated to maximise results.

Biomass

Biomass or wood burning systems use pelleted or chipped wood. They differ from other renewable energy sources because although they release carbon dioxide (CO2) when they are burnt, but this is

[21] At several metres below the earths surface the ground maintains a constant temperature of 11-13oC

[22] 15m to 150m depending on ground conditions and the size of the system.

[23] Approximately 2m.

equal to the carbon absorbed when the tree was growing so the process is essentially carbon neutral. In order for biomass to be a truly renewable energy source, the fuel must come from a sustainable source i.e., the wood is replanted, and it should be used close to where it was grown. Wood burning stoves and boilers are available in any size depending on whether they are required to heat one room or the whole building. They can achieve efficiencies of 80-90% and can be used in homes and commercial buildings. Some types of appliances can be fed automatically from an external store.

Biomass refers to the use of organic material such as wood and waste to generate heat and electricity. It can be categorised into two types: dry biomass and wet biomass. The use of dry biomass involves combustion, whereas the use of wet biomass involves fermentation or digestion.

Dry Biomass

The most common source of dry biomass material is wood form forests, urban tree pruning farmed coppices or wood waste from farms. The raw material is normally processed into pellets or wood chips. Dry biomass is considered carbon neutral as the CO2 emitted during burning is balanced with the CO2 absorbed in growing the organic material.[24] To ensure that the benefits of biomass are not outweighed by the impact of transporting the material, it is essential that there is a local and adequate supply.

Biomass can be burnt directly to heat water and/or spaces or be used in more efficient combined heat and power systems to generate both heat and electricity (see related section for further information). It can be used across all types of development, including single dwellings, however, the need to provide space for the combustion plant and storage facilities make small sites impractical. Arrangements also need to be in place for the disposal of ash.[25]

Under the right economic and supply conditions, the payback for biomass can be shorter than other renewable technologies. However, the technology requires higher maintenance and monitoring to ensure compliance with legislation such as the Clean Air Act.

Wet Biomass

Wet biomass involves the fermentation or digestion of waste to provide a gas which is then burned to produce heat and/or electricity. The process has the benefit of using materials which are otherwise difficult to dispose of including agricultural, household and industrial residues and sewage sludge.

Due to the nature of wet biomass, site selection for plants needs to carefully consider transport movements to and from the site and the effects of odour.[26]

[24] Plants absorb CO2 during photosynthesis.

[25] Ash is produced at a rate of around 1% of the total weight of biomass burned. The ash from most biomass fuels can be safely returned to the soil as fertiliser

[26] It should be noted that anaerobic digestion can bring benefits in terms of odour reduction over the raw fuel.

Wind Energy

Wind turbines convert the power of the wind into electricity using rotating blades to drive a generator. To be effective the turbine must be sited where it would benefit from adequate wind and where the blades would be free to rotate without interference or turbulence. There are two types of wind turbine: horizontal blade turbines and vertical blade turbines.

There are three categories of turbine:

- Large: A collection of large-scale wind turbines located in countryside locations (hub height can be as much as 100m). These are often referred to as wind farms. Electricity is provided for use in the national grid.
- Small: Individual Free Standing: often smaller turbines than within a wind farm but can still be significant structures (hub height typically 6m to 25m). Usually located in non-residential areas. Generally provides electricity to nearby properties.
- Micro: small turbines mounted on buildings so that the blades extend above the roof of a building. Generally provides on-site electricity generation.

Turbines can be effectively integrated into the design of buildings, however, local wind speed should be monitored for at least 6 months to ensure the viability of the location. Due to their size and prominent appearance consideration must be given to their visual impact. Issues of noise also need to be considered if in proximity to houses and other sensitive activities or designations.

The electricity generated can be linked to the National Grid or can be used to charge batteries. Modern wind turbine designs tend to be very near silent in operation such that the wind in the leaves on trees can be louder. Wind turbines typically cost from £2,500-£5,000 per kilowatt of generating capacity installed.

A design and access statement will need to be submitted to cover the majority of developments and parking is a key aspect that must be covered. In some cases parking arising from development will require measures to be put in place to manage the impact of parking on the public highway. This includes physical protection against parking (i.e. on verges) or protection via Traffic Regulation Orders against short/long stay parking at inappropriate locations (i.e. at junctions, in locations that may conflict with pedestrian movements). All parking management required as a result of new development must be provided by the developer and should have regard to the Council's Parking Strategy and other parking management in the area.

Energy Storage

Home energy storage systems store generated electricity or heat (e.g. solar, PV, wind, or hydroelectric systems) and can in the form of electrical batteries or heat storage systems. Such systems are useful for households generating their own renewable energy as it allows them to store surplus energy and use it as when required. This is particularly helpful in planning electricity usage for charging Electric vehicles or domestic heat pumps.

Government Financial Incentives

Capital allowances: Investment on energy-efficient items including low or zero-carbon technology can be claimed back as capital allowances, enabling the deduction of the full costs of qualifying assets from profits before tax.

Reduced rate of VAT: A reduced rate of 5% VAT is available for installing specific energy saving material in residential homes. This also includes the curtilage of residential accommodation and applies to the price of the goods to be installed (it won't apply to the purchase of goods without the installation process). There are conditions attached such as the supply of the installation being to a qualifying person (over 60 or in receipt of certain of benefits) or to a relevant housing association. The incentive includes insultation, solar panels, heat pumps, micro–Combined Heat and Power (CHP) units, central heating/ hot water system controls and wood fuelled boilers. The reduced rate of VAT is also available for grant-funded installations of heating appliances, central heating and renewable source systems.

Climate Change Agreement (CCA) scheme: The Climate Change Levy (CCL) is an energy tax which aims to increase energy efficiency. The main rates of the Levy apply to energy intensive commercial and industrial businesses on the electricity, gas or solid fuels they yes. However, exemptions from the levy apply if energy is supplied from certain combined heat and power (CHP) schemes reregistered under the CHP quality assurance programme. Exemption also applies where electricity was generated from renewable sources.

The Home Upgrade Grant: The Home Upgrade Grant (HUG) will provide energy efficiency upgrades and low carbon heating via local authority funding, to households in England that are low income, off the gas grid and have energy performance certificates between bands D&G. Phase 2 of the Grant applies to certain LPAs between 2023 and 2025.

The Social Housing Decarbonisation Fund: Provides government funding to improve the energy performance of social homes in England. The scheme runs with a fabric first principle to maximise the dwelling's suitability for low carbon heating either now or in the future. Registered providers must improve their stock using a fabric first approach to at least a minimum of EPC C.

Hertfordshire County Council's environmental improvement grant scheme[27] is available to support small projects that will help deliver the Council's biodiversity objectives/; to enhance nature by 20% by 2050 and to establish at least 1.8m trees across the county by 2030.

Transport

In some circumstances the traffic generated by a new development will require a Transport Assessment to be submitted as part of the planning application.

Full guidance on the transport assessment process is available at: http://www.dft.gov.uk/pgr/regional/transportassessments/guidanceonta

[27] Further details available here: www.hertfordshire.gov.uk

Additional information can be found in Roads in Hertfordshire.

Transport assessments will be required for:

- Residential development in excess of 25 units (50 for retirement dwellings) or,
- Where traffic levels to and from the proposed development are likely to exceed 5% of the two-way traffic flow on the adjoining highway from which it takes access
- Where traffic congestion exists or will exist within the assessment period; and
- In sensitive locations such as adjacent or close to traffic lights or roundabout junctions.

Design and Access statements will need to be submitted to cover the majority of developments and parking is a key aspect that must be covered.

In some cases parking arising from development will require measures to be put in place to manage the impact of parking on the public highway. This includes physical protection against parking (i.e. on verges) or protection via Traffic Regulation Orders against short/long stay parking at inappropriate locations (i.e. at junctions, in locations that may conflict with pedestrian movements). All parking management required as a result of new development must be provided by the developer and should have regard to the Council's Parking Strategy and other parking management in the area.

Electric Vehicle Charging Points

In January 2022 the Government adopted amendments to Building Regulations, to require new developments to provideEV charging points. The amendments in Part S of Schedule 1 to the Building Regulations 2010 took effect on 15 June 2022 for use in England. Whilst most of the requirements of these Building Regulations are reflected in the advice in this document, additional guidance is provided on the requirements by development type.

Car & Cycle Parking

NHDC's Vehicle Parking at New Development SPD was adopted in November 2011 and provides guidance on parking provision at new developments in line with national policy that promotes local decision making on appropriate parking standards.

The standards apply a 'minimum' parking standard to residential development that takes into account levels of car ownership and expected growth, whilst retaining 'maximum' provision for non-residential development along with the zonal approach to parking restraint.

Applications for new residential development must seek to promote walking, cycling and public transport and in doing so developers may make a case for negotiating the provision of parking below the minimum standard. Clear evidence must be provided that residents and visitor parking demand will not exceed the parking provided OR that alternative short and long stay daytime and evening parking will be readily available to future residents and visitors. The developer should identify examples of this evidence from other developments or locations in similar circumstances to those found in the district. The

Council does not consider, however, that residents will chose not to own cars if they live within the most accessible areas or corridors.

Parking provision with development proposals should link in with a Sustainable Travel Strategy and include EV charging points.

Sustainable Transport

The NPPF expects development proposals to ensure that "appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location".

Sustainable transport should be considered at the outset when designing new developments taking into account the potential impacts on congestion and air quality (see Air quality section). The emphasis should be on reducing reliance on private vehicles and promoting modal shift through public transport and active travel provision. Ideally, new development should incorporate segregated pedestrian and cycle paths located away from motorised traffic.

For larger strategic developments the provision of local services and facilities can also help the need to travel further afield to access such services (e.g. retail, health and education). Further information is provided by the North Herts Transport Strategy.

Development proposals are therefore required to include travel plans and transport assessments and statements demonstrating how they deliver sustainable transport objectives and support modal shift.

The layout of streets should be designed to facilitate efficient bus operation. Consideration should be given to including bus gates and priority at traffic signals. All bus stops should be connected to the surrounding area by direct and safe walking routes. Railway stations and bus stops on major corridors, served by 'express' services, should include secure cycle parking and safe cycling routes from the surrounding area.

Figure 18 - Proposals should tip the balance in favour of sustainable transport (Source: CIHT)

Well-designed secure cycle parking within dwellings and other areas should be conveniently located to encourage greater use.

Electric vehicle/cycle spaces and charging points need to be suitably located to avoid street clutter.

Development should consider access for servicing such as refuse collection, deliveries, and removals. Further guidance is provided in the National Design Guide.

Sport England's Active Design guidelines sets out active design guidelines on how to incorporate public transport, and active travel networks through development and into existing communities.

NHS England's Putting Health into Place provides further guidance including case studies showing how active travel provides the most

sustainable from of transport and how it can facilitate improved health and wellbeing.

Car-sharing schemes and car clubs are actively sought in the district, including in new developments, to give residents a practical alternative to owning a car, especially a second or third car, which may be used only occasionally..

Enhanced digital connectivity such as high-speed broadband services can help facilitate home working thus reducing the need to travel helping maintain the post Covid trend towards hybrid working.

Digital technologies can also be used to enable digital transport service platforms such Mobility as a Service (MaaS) systems[28]that enable users to access, pay for, and get real-time information on, a range of public and private transport options. Examples of MaaS include the app Whim in the West Midlands, and MaaS Scotland. The former offers a range of monthly plans, bringing in National Express, Transport for West Midlands, Gett, Nextbike and Enterprise rent-a-car as transport providers.

Electric Vehicle Charging Points

New residential dwellings are required to include vehicle charging points in accordance with the requirements set out in the Building Regulations and HCC's and NHDC's standards.

[28] Mobility as a Service (MaaS) in the UK: change and its implications (publishing.service.gov.uk)

Checklist:

	Bronze	Silver	Gold
Transport statements, assessment and Travel plans demonstrating how sustainable transport provisions and provisions of adequate access to site (Vehicular, Pedestrian and Cycle)	✓	Additionally Seek to achieve 50% sustainable travel Car clubs/ ride sharing schemes Community transport schemes Cycle hire schemes	In addition to segregated cycle ways, pedestrian paths, away from motor traffic and integrated with green infrastructure Ensure every home is within short walking (5-10 mins) distance from a bus stop. Incorporate a digital Mobility as a Service (MaaS) system providing real-time access to a range of public and private transport options such hail a ride bus service.
EV charging requirements: Dwellings with garage or private driveway (Class C)	One active EV charging point per dwelling – 7kW rating	Same number of chargers at 22kW	Same number of 50 kW rapid chargers
Dwellings without garage/ private driveway OR those with associated parking within communal car park e.g. flats (Class C)	All parking spaces must have one active EV charging point where: The number of parking spaces equals or is lower than the number of dwellings. Minimum 7 kW rating. All remaining spaces must have passive provision installed.	Same number of chargers at 22kW	Including provision of some 50 kW rapid chargers
Car club provision in residential/ mixed-use developments (Class C)	All spaces to have 100% active EV charging points at 7kW	Same number of chargers at 22kW	22 kW plus some 50 kW rapid chargers

All disabled parking within any residential development	All disabled spaces to have 100% active EV charging points at 7KW	Same number of chargers at 22kW	22 kW plus some 50 kW rapid chargers

Air Quality

The NPPF states that air pollution is a material planning consideration therefore an assessment of air quality must be included with applications identifying any potential adverse effects on local air quality. The impacts of exiting pollution (including cumulative effects) on proposed development should also be taken into consideration as part of the assessment.

The main pollutants of concern are nitrogen dioxide (NO_2), and particulate matter (PM10 & PM2.5) from vehicular traffic. Levels of NO_2 are close to exceeding a national air quality objective around the A505 in the Hitchin Street / Whitehorse Street area of Baldock. Of particular concern is the area in the south of Hitchin. Notably Stevenage Road (A602) near the Hitchin Hill roundabout, which has been designated an Air Quality Management Area (AQMA) and the Payne's Park roundabout at the A602 junction with the A505 which was designated an AQMA in 2016.

The NPPF states that *"planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas."* It adds that *"Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement"*

The national pollutant objective limits relevant to vehicular traffic and are outlined below:

Pollutant	National Objective levels (England)
NO_2	200 µg/m^3 not to be exceeded more than 18 times a year 40 µg/m^3
PM_{10}	Annual average not to exceed 40 µg/m^3 & 24-hour average of 50 µg/m^3 not to occur more than 35 times in a single year.
$PM_{2.5}$	20 µg/m^3 & 10 µg/m^3 by 2040 (The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

Hertfordshire's Local Transport Plan (LPT4) highlights the role of transport as a major contributor to air pollution in the county recognising its adverse impact on human health. It identifies transport and growth as presenting threats to the local air quality and supports reducing car use and new fuel and energy technologies as a way to help improve air quality. The importance of tackling air quality in Hertfordshire is also outlined in Hertfordshire County Council's Air Quality Strategy 2019 and NHDC's Annual Air Quality Annual Status Report (ASR).

NHLP Policy D4 (Air Quality) expects proposals to consider impacts on air quality and to provide air quality impact assessments (where applicable) demonstrating that the development will not produce unacceptable impacts on local air quality (pre, during and post construction). Developers would be expected to provide appropriate levels of mitigation even where an impact assessment is not required.

The NHLP requires an air quality impact assessment in the following instances:

Development within or adjacent to an AQMA:

- Housing
- Biomass or other combustion boiler
- Industrial developments
- Car parks
- Developments likely to significantly increase vehicle movements

Development elsewhere in the District:

- 'Major' developments that lead to significantly increased car parking / traffic movements particularly heavy duty vehicles.
- Industrial developments
- Development introducing people to a previously unpopulated area where air quality is an issue.

An approach to considering the impact of a development on air pollution and the potential mitigation of such is in place in the form of the air quality planning guidance that can be found at http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-and-planning

Demolition and Construction Management Plan

A Detailed Demolition and Construction Management Plan must submitted for approval by NHDC prior to commencement of construction. This is in order to ensure that adequate measures are adopted to control nuisance during works associated with the development from the spread of pollution, notably dust and fine particulate matter.

Travel Plan

A detailed travel plan shall be in place prior to development. This should be prepared in accordance with per the Herts Travel Plan Guidance at www.hertsdirect.org and include the following:

- The travel plan shall be fully assessed prior to its approval in conjunction with local authority officers.
- Agreed targets and objectives included in the travel plan are secured for implementation by mutual agreement of the local authority and the developer/applicant (normally by means of a Section 106 agreement).
- The outputs of the travel plan (typically trip levels and mode split) are annually monitored against the agreed targets and objectives.

- Should the travel plan not deliver the anticipated outputs or meet the targets and objectives further mitigation/alternative/compensation measures need to be identified and implemented.

- A named co-ordinator is required for success of the travel plan.

Measures to improve air quality.

- Development should be located in sustainable locations in terms of proximity to services and facilities to reduce the need to travel.

- Development design should prioritise sustainable and active travel modes to help reduce reliance on private cars (see transport section).

- Green infrastructure can be used to protect residents from air pollution. This should be included within the air quality assessment.

- Children are more vulnerable to the effects of air pollution therefore play/ recreation spaces should be located such as to minimize exposure to air pollution.

- Provision of EV charging infrastructure within development will help encourage Electric Vehicle usage and help reduce NO2 emissions.

Waste

Proposals should seek to minimise operational and construction waste and include strategies to maximise the recycling of materials.

Construction Waste

Major Residential development should demonstrate best practice through the efficient management of waste during construction. This consists of measures to minimise construction waste and to maximise diversion of remaining waste from landfill.

The requirement is that Applicants will be expected to produce a Site Waste Management Plan (SWMP) demonstrating recycling of non-hazardous construction waste and diverting it from landfill.

Operational Waste

Homes should be provided with separate bins in line with the recycling and waste collection policy of NHDC and a compost bin should be provided for any ground floor private garden of 50m^2 or above.

Segregated kitchen bins make it convenient and simple for occupants to contribute fully to the recycling of domestic waste.

Doors to bin stores should be sufficient in width to allow the movement of bins at their widest and prevent entrapment of limbs. This is likely to be a minimum of 20cm in addition to the widest bin contained in the bin store.

Walls and doors should have protection strips to prevent damage and a mechanism for holding doors open should be available. Doors should ideally be keypad entry or standard fire brigade keys. We do not support the use of electronic key fobs. Roller shutters on bin stores can be considered to save space however the additional noise impacts should be considered.

Dropped kerbs should be provided to allow for ease of movement of bins to the collection vehicle and the pathway should be 1.5m in width taking the most direct route avoiding passing parked cars.

We do not advise the use of bin compactors, as they often cause excessive damage to bins or cause waste to get stuck inside bins. If bin compactors are used on site you should advise your waste collection contractor.

Bins in communal bin stores should be manoeuvrable to the refuse collection vehicle without the need to move other bins. Pull distances to the collection vehicle should not exceed 15m in accordance with BS5906:2005.

For flats, bins should be ordered direct from the Council's contractor 10 weeks in advance of first occupation to ensure they arrive in time for the first residents moving in.

Separate internal storage provision for waste should be provided in kitchen areas to support the recycling of different waste streams to support the National Planning Policy for Waste's requirements to support driving waste up the waste hierarchy.

Storage areas should be conveniently located with easy access for residents - residents should not have to take their waste and recycling more than 30metres to a bin storage area or take their waste receptacles more than 25 metres to a collection point, (usually kerbside) in accordance with Building Regulations Approved Document H Guidance.

Consideration should be given to parking arrangements alongside or opposite the access to individual streets. If car parking is likely in the vicinity of junctions then parking restrictions may be required to ensure access is not inhibited.

For infill applications consideration should be given to parking arrangements alongside or opposite the access to the site. If car parking is currently permitted the consideration of parking restrictions may be required to ensure access is not inhibited.

For houses, bins should be ordered direct from the Council's contractor 2 weeks in advance of first occupation to ensure they arrive in time for the first residents moving in.

Pull distances from the storage point to the collection point should not be within close proximity to parked cars.

The applicant should note that collections occur from the kerbside and residents will be required to present their bins in this location on collection day.

Further general advice on waste provision for developments is available on our website. The bin requirements stated there are specific to North Herts, but the rest of the advice is general.

Materials

Materials and products used in building, such as steel, plastic and aluminium, are created by a production process of raw material extraction, raw material process, melting, manufacture to final products and transportation to a building site. Each of the steps consumes energy, which is also expressed in terms of carbon emissions. Total carbon emissions of all building materials and products and the construction involved to put them together is known as building's embodied carbon. Some estimates suggest embodied carbon accounts for about 20% of the carbon emissions from the building sector.

Applicants are encouraged to:

- re-use materials, such as existing stone on site or other materials reclaimed from existing buildings (such as bricks or timber) on or near site or use substituted materials in priority to primary aggregate.
- use recycled materials where appropriate, such as crushed bricks or concrete for hard-core. www.greenspec.co.uk/building-design/ reclaimed materials/
- use low carbon alternatives to standard building products where possible and appropriate, such as low carbon bricks or 'green concrete' straw bales or 'hempcrete'.
- use timber from well managed sources, ideally from Grown in Britain sources www.growninbritain. org or failing that, using FSC certified timber or equivalent. www.fsc-uk.org/en-uk/aboutfsc/what-is-fsc
- use locally sourced materials where possible due to the need to reduce carbon miles inherent in transporting materials from afar.

Green Infrastructure (GI)

Well-designed GI can provide multifaceted benefits to climate change adaptation and mitigation as well as health and wellbeing benefits. The NHDLP includes policies addressing GI such as SP12 and NE1 which seek to protect / enhance the existing strategic GI network and create new GI were appropriate. GI should be an integral part of new development and its surrounding and ought to be considered as early as possible at the pre-application and masterplanning stages. Natural England's Green Infrastructure Framework - Principles and Standards[29] document can be used to inform the design of a comprehensive GI (including blue infrastructure) within new development that address local needs and responds to local opportunities. Natural England's Green Infrastructure Principles[30] covers the 'Why', 'What' and 'How' of good GI can help inform the scale of GI requirements for a development. It sets out 15 principles on which to base well designed GI as illustrated in Figure 19.

[29] Natural England - Process Journey for Developers and Design Teams

[30] Natural England Green Infrastructure Principles

Figure 19 Green Infrastructure Principles Wheel (Natural England)

Natural England set out the process journey illustrated in Figure 20, for developers to incorporate GI into development using the Green Infrastructure Framework Principles and Standards for England.

Figure 20 - Recommended stages for incorporating GI into new development

Water Use

Reducing Water Use

Development, involving new construction or change of use and refurbishment, can save water by including measures such as:

- systems for greywater reuse
- aerated washbasin/kitchen taps and shower heads,
- tapered and low capacity baths,
- sensor and low flush toilets,
- shower timers,
- water efficient white goods and appliances such as washing machines and dishwashers.

Measures to conserve water used during construction can include:

- closed loop wheel washers,
- waterless wheel washing using angled steel grids to remove debris,
- high pressure low volume power hoses,
- recirculating water where possible,

- limiting the water used for flushing building services by stopping it as soon as the flush water turns clear, and
- employing a regime for monitoring water use and water waste.

Choosing the best location for a boiler can reduce water consumption and heat loss. By minimising the length of hot water pipes the volume of water that must be drawn off each time a tap or shower is used can be reduced. Positioning hot water pipes above pipes carrying cold water will reduce heat transfer. Further heat loss can be reduced by insulating the piping.

For all new dwellings, a completed "water efficiency calculator for new dwellings" worksheet that accords with Part G of the building regulations' Approved Documents should be provided prior to occupation. The calculation must demonstrate that the new dwellings will achieve a maximum water usage of 110 litres per person per day.

Rainwater harvesting

Rainwater harvesting involves the collection of rainwater directly from the surfaces it falls on (e.g. a roof). Once collected and stored it can be used for non-potable purposes such as watering gardens, supplying washing machines and flushing toilets, thereby reducing consumption of potable water. Potable water is produced through a purification process and is pumped over large distances, both of which require energy and result in embodied carbon that is not present in water harvested locally. In a residential development, rainwater can be captured for domestic use using water butts connected to a down pipe. Larger systems can use water stored in underground water tanks.

Schemes should be designed to include space for water storage. In residential developments, down pipes should be carefully placed so that water collection and use is convenient for residents.

Greywater re-use

Water that is recycled from bathrooms and kitchens for non-potable uses is known as greywater. Greywater systems must ensure treatment on a regular basis to prevent a build-up of bacteria, and some systems are powered, which entails an energy cost. As a result, greywater reuse is generally less preferable than water use minimisation measures.

Water recycling systems are better suited to new developments rather than retrofitting in existing buildings because of the excavation required for storage tanks and changes needed to the plumbing system, and they are generally more cost effective for new developments and developments of a larger scale.

Recycling systems should be backed up by mains supply or a sufficiently large reserve storage system to meet higher demands during dry spells. Storage tanks will need an overflow to allow excess water to be released which should be able to flow into a soakaway.

Adaptation to Climate Change

North Herts District Council declared a climate emergency in May 2019 pledging its commitment to become a Net Zero Carbon District by 2040 and to making the District resilient to the unavoidable impacts of climate change.

The NPPF defines climate change adaptation as: adjustments to natural or human systems in response to the actual or anticipated impacts of climate change, to mitigate harm or exploit beneficial opportunities. Paragraph 153 states that: 'Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.'

Therefore, development needs to adapt to the effects of climate change, which in the East of England is likely to produce:

- Wetter, warmer winters, leading to increased flood risk.
- Hotter, drier summers, leading to water scarcity, drought and placing greater strain on wildlife and human health.
- More frequent extreme events, such as heatwaves, gales, storms, surges, and intense rainfall.

Flood Risk

The NHLP strategic objective ENV4 seeks to mitigate the effects of climate change and reduce the risk of flooding. The Plan is supported by a Strategic flood Risk Assessment (SFRA) which identifies mitigation required to reduce the risk of flooding from surface water. The SFRA provides the basis for applying the sequential test and exception tests for development sites. Proposals for development in an area at risk of flooding may be refused planning permission where it increases flood risk or conflicts with the sequential approach set in the NPPF. Plan policies such as SP11 seek to meet the challenges of climate change and flooding supporting a risk-based approach to development and flood risk. Development is directed to areas at lowest risk of flooding and policy.

It is important to understand the risks of flooding to proposed development sites from all sources (including surface water, fluvial and groundwater). This should also factor in how risk is likely to change in the future. Further guidance is provided in Planning Practice Guidance on flood risk and coastal erosion (Aug. 2022). The latter includes the application of the sequential and exception tests and encourages an integrated approach to flood risk management. Measures must be taken to ensure development does not increase the risk of flooding for nearby communities.

Sustainable Urban Drainage System (SuDS)

NHLP Policy NE8 requires the provision of Sustainable Urban Drainage Systems (SuDS) to manage surface water run-off. These can include a variety of forms including green roofs, swales, permeable pavements, and retention ponds. Well-designed SuDS emulate natural drainage patterns and integrate with wider green infrastructure (see Policy SP12) providing multiple benefits including reducing surface water flooding, enhancing biodiversity, water quality and providing amenity benefits. Measures for the re-use of rainwater should be included wherever possible. Proposals are expected to aim towards meeting the higher, most sustainable end of the hierarchy (Figure 21).

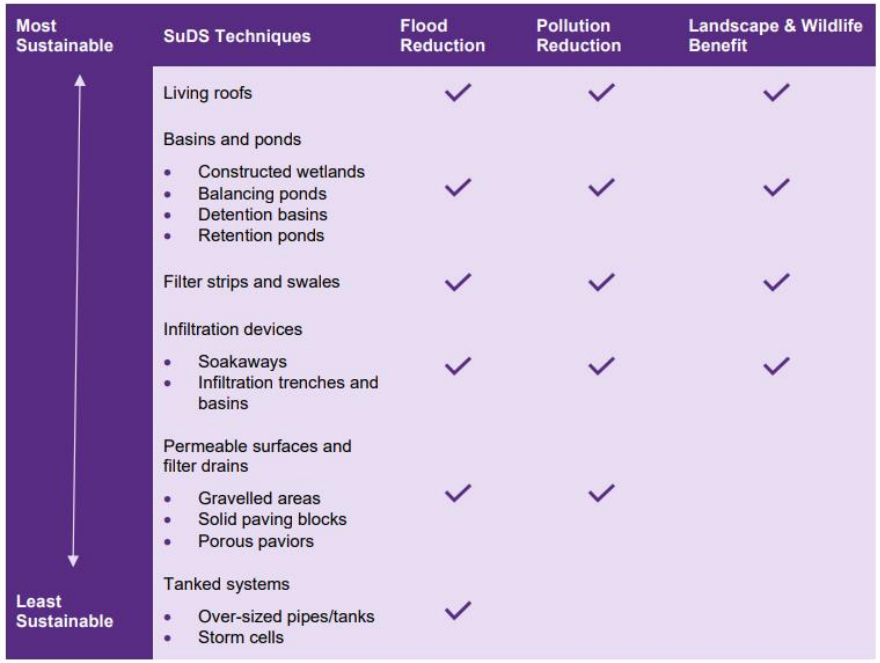


Figure 21 - The SuDS Hierarchy

SuDS best practice guidance

- The overarching principle of SuDS design is that surface water should be managed for maximum benefit in accordance with the 4 pillars (or benefits) of SuDS which are:
    - water quality,
    - water quantity,
    - amenity, and
    - biodiversity (Figure 22).
- All development proposals should be informed by an overall awareness of their potential impacts on, and exposure to the surrounding water environment taking into account all sources of flood risk.

- The developer is responsible for ensuring proper provision for surface water drainage into the ground, water courses or surface water sewers. Drainage to the foul sewer will not be accepted as it could contribute to sewer flooding.

- Development proposals should avoid harm to existing water courses including through increasing risk of blockage, erosion or disruption of their natural flow patterns or culverting, pipe crossings or altering the natural course of the water body.

- Works on or near watercourses may require prior permission from the Environment Agency or the Lead Local Flood Authority (Hertfordshire County Council). Contact should be made with these authorities or NHDC to ascertain the requirements.

- Proposals should identify likely impacts on water run-off rates and volumes and include measures demonstrating how these can be mitigated. This should take cumulative impacts into account by considering overall development growth in the area covered by buildings and hardstanding. Suitable mitigation can include SuDS features such as rainwater harvesting, green roofs/ walls, swales and retention ponds.

- SuDS strategy should be considered early on in the design process taking into account the site's geology, water table levels, topography and constraints. This should also consider synergies between the SuDS features proposed and benefits to biodiversity, quality of public realm, shading and water quality (filtration of run-off) and water efficiency.

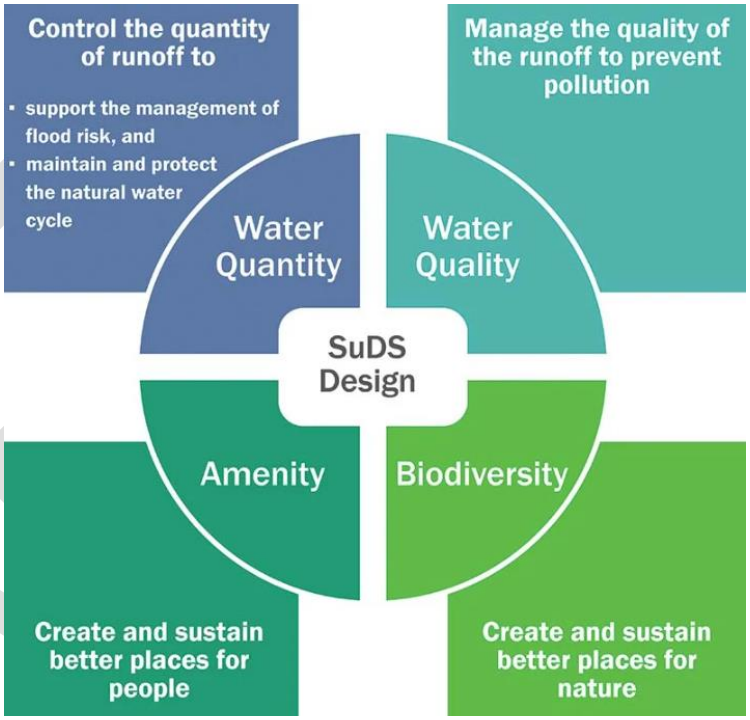


Figure 22 - The 4 pillars of SuDS design

SuDS Toolkit

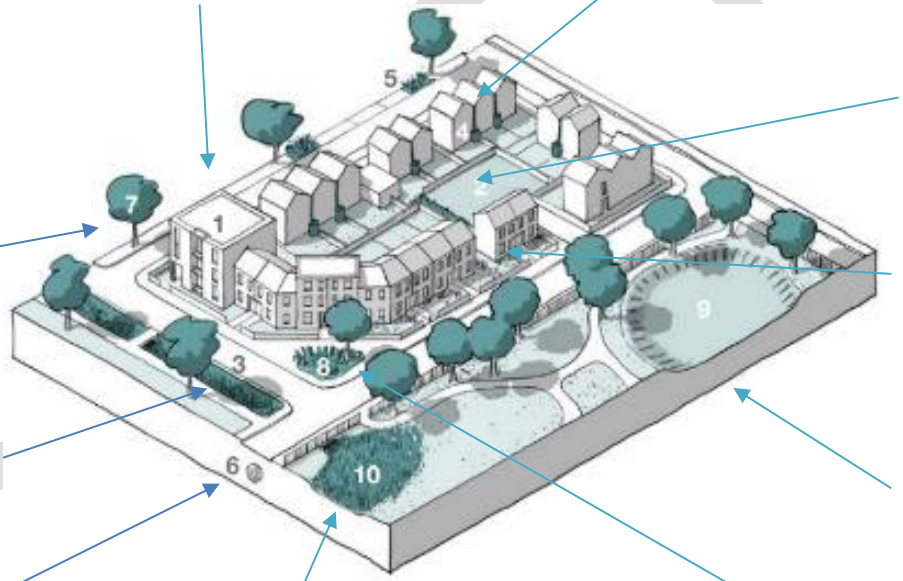
The National Model Design Code SuDS Toolkit sets out a variety of tools that can boost sustainable drainage in different contexts These including the following elements:

1 - Green roofs and walls which serve to attenuate water run-off and produce ecological benefits

5 - Soakaways and filter drains reduce surface water run-off contamination reducing potential impacts on nearby habitats

4 - Rain harvesting utilising water butts for use in gardens

7 - Street trees are important assets helping reduce flood risk resulting from intense rainfall and contribute to biodiversity



2 - Permeable landscaping and surfaces allowing water to infiltrate through the ground

3 - Swales provide attenuation and channel water to features such as ponds.

9 - Basins and ponds are normally dry but fill during rain events and store or gradually discharge water to the system

6 - Retention Tanks can store run-off in underground tanks within high density developments

8 - Rain gardens in the form of containers and ditches with native drought tolerant plants release water gradually and filter out pollutants

10 - Reed beds/ wetlands can provide attenuation, filter our pollutants and provide habitat for wildlife

SuDS Checklist:

Surface water drainage strategy	Bronze	Silver	Gold
Ensuring surface water run-off is managed as close to its source as possible. This should include a maintenance plan	SuDS strategy addressing surface water management demonstrating that Run-off rates from development will not exceed greenfield runoff rates	SuDS strategy also follows DEFRA's non-statutory SuDS technical standards	SuDS strategy will also address the 4 pillars of SuDS Scheme will achieve better than greenfield (pre-development) run off rates
Demonstrates that scheme will not increase downstream flood risk	This must demonstrate that scheme will achieve greenfield run-off rates. Where this is demonstrably not feasible, a minimum 50% reduction will be required	Runoff volumes from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event	System will not discharge to combined sewers

Adaptation to higher temperatures

Extreme heat events can pose significant risk to human health, infrastructure and economic productivity. Therefore, it is important for development to include adaptation measures to improve resilience to extreme heat events.

Built up areas tend to be hotter than rural or countryside areas due to the concentration of buildings, paving and tarmac which absorb heat. This 'urban heat island effect' is most noticeable during hot summer days and can have serious adverse effects on health and infrastructure. The following measures can mitigate the urban heat island effect:

- **Trees:** provide shade and cool air through transpiration in addition to other benefits such as removing carbon dioxide and enhancing biodiversity.
- **Green roofs and walls:** help insulate buildings from heat and cool air temperatures through transpiration/ evaporation with additional carbon sequestration and biodiversity benefits.
- **Shade providing structures**: such as pergolas, arcades, canopies and awnings.
- **Colours**: unlike darker colours which absorb sunlight, lighter colour reflect light helping to reduce heat.
- **SuDS:** provide cooling effects through evaporation and help counteract some of the effects of hard impervious surfaces in urban areas which rapidly convey water away, preventing cooling associated with evaporation. Again, this can provide multiple benefits including to biodiversity, flood risk reduction, water filtration and conservation.
- **Water features:** such as fountains create spray which provides cooling effects through evaporation.

Water efficiency standards

- **Design:** passive cooling techniques can be incorporated into buildings and design measures such as layout and using a variety of heights can facilitate better air flow to convey heat away more efficiently. The use of less heat absorbing materials can also help.

North Herts district is within an area of 'serious water stress'[31]. This implies that demand is high compared to available water resources. Population growth coupled with droughts and extreme weather events associated with climate change are expected to exacerbate this issue. Therefore, it is important to ensure the long-term sustainable management of water supplies as well as the protection of our local rivers and wildlife.

The NPPF (paragraph 153) expects plans to proactively mitigate and adapt to the long-term implications of climate change including on water supply.

[31] Environment Agency report: 'Water stressed areas - final classification 2021'

The Building Regulations include a requirement for all new dwellings to achieve a water efficiency standard of 125 litres of water per person per day (lpd). They also include an optional, higher efficiency requirement (part G) of 110 lpd for new residential development. The NHLP seeks the lower 110 lpd water consumption figure as the District lies in an area of serious water stress. The Council supports adopting higher efficiency standard where practicable.

	Bronze	Silver	Gold
Water efficiency standard	110 lpd (Non-res?)	Less than 110 lpd (min 2 credits for category Wat 01 of BREEAM)	80 lpd (Non res achieves full credits for category Wat 01 of BREEAM

Achieving higher water efficiency can be attained through the use of more water efficient taps, shower heads, domestic appliances, the fitting of flow restrictors and more efficient WCs (e.g. dual flush mechanisms and lower flush volumes and air assisted low flush technology). Other options include rainwater harvesting and greywater recycling (see Water Use section above) where a proportion of mains water is replaced with water collected from the roof and/ or water recycled from within the building. Rainwater harvesting involves collecting rainwater through roof guttering and channelling it to storage tanks which then feed into the dwelling for use in flushing toilets or washing machines for example. There is a wide variety of systems ranging from simple water butts to underground storage and pumping systems.

Greywater recycling involves collecting wastewater (usually from bathing/ showering and washing up) and using it for toilet flushing and/ or watering flower beds and gardens (See Water Use section).

Renewable Energy developments

NHDC is responsible for determining planning applications for renewable development of 50 megawatts or less installed capacity. Domestic installations are discussed elsewhere in this document and schemes above 50 megawatts are determined by the Secretary of State for Energy. NHL's policies NE12 and SP11 support renewable and low carbon energy development in appropriate locations subject to assessment of the impacts on the landscape, environment, heritage assets, transport, air quality, aviation and amenity. The policy also supports decentralized energy schemes associated with strategic development allocated in the plan. Application are likely to be refused where proposed schemes are considered to give rise to significant adverse impacts which outweigh the wider benefits of renewable energy development identified above. However, the Council will consider to what extent any adverse impacts can be mitigated through the design and siting of proposals or by applying appropriate planning conditions and will take the views of local communities into consideration when determining applications.

Siting principles for standalone renewable energy schemes

Solar/ PV developments should be sited where they would have the least adverse impacts. Proposals which would contribute towards reducing greenhouse gas emissions will be permitted subject to an impact assessment demonstrating that proposed schemes:

- Do not harm the role and purposes of the Green Belt[32] unless they can demonstrate very special circumstances.
- Minimise impacts on the landscape character and locally sensitive features, particularly in relation to the Chilterns Area of Outstanding Natural Beauty.
- Do not produce adverse impacts on:
    - Biodiversity sites
    - Air quality
    - The historic environment
    - The transport networks
    - Aviation interests
    - Landscape quality, landscape character and visual amenity, including consideration of cumulative impacts of development;
    - The amenity of residents

[32] The NPPF defines the 5 purposes of the Green Belt as : to check urban sprawl, prevent coalescence, safeguard countryside from encroachment, preserve character of historic tons and facilitates recycling ro derelict and other urban land.

The Hertfordshire renewable and Low Carbon Energy Technical Study was commissioned to assess the potential for renewable energy generation schemes in the District. This may assist developers to choose the appropriate renewable technology, depending on the location of the development.

Proposals for solar farms involving the best and most versatile agricultural land and proposals for wind turbines will be determined in accordance with policy NE12 of the NHLPand national policy. Opportunity areas in District were identified in the Hertfordshire Renewable and Low Carbon Energy Technical Study.

In assessing renewable and low carbon energy proposals against the above criteria the Council will give significant weight to their local and wider benefits, particularly the potential to reduce greenhouse gas and other harmful emissions, and the social benefits of community owned schemes where this is relevant.

Proposals for decentralised energy schemes associated with development of the strategic sites allocated in the Plan will be encouraged subject to an assessment of the impacts above.

In all cases, end of life/redundant plant, buildings, apparatus, and infrastructure must be removed and the site restored to its former state or a condition agreed with the Council.

Application process

Typically the application process involves the following steps:

- Contact NHDC Planning team for initial advice/ guidance
- Pre application stage: consult HCC, Natural England, Historic England, the Environment Agency, the Highways Agency, MoD and Internal Drainage Boards.
- Obtain Environmental Impact Assessment (EIA) Screening Opinion from NHDC. An Environmental Statement (ES) will be required is the development is screened-in for EIA.
- Provide a Statement of Community Consultation.
- Design and Access Statement.
- Landscape & Visual Impact Assessment including impacts on the Chilterns AONB and on the Green Belt.
- Heritage Statement.
- Ecological Survey identifying any adverse impacts and including management plans and mitigation measures.
- Noise Impact Assessment.
- Air Quality Impact Assessment.
- Transport Statement.
- Decommissioning and Restoration Statement.

Community Energy Schemes

Community energy schemes can make a significant contribution to the decarbonisation of the District while supplying community benefits such as affordable energy. These could include neighbourhood or village heat networks, solar PV schemes, or community run hydro's[33]. Further information and technical support is available through the Greater South East Energy Hub and the council will support in principle community led schemes. Macro-renewable schemes are expected to include an element of community investment such as through local shareholder investment, the provision of lower cost energy to community services such as schools and community centres, and/or setting up a community fund or trust.

[33] See Halton Lune Hydro example

4 Historic Buildings

Introduction

Energy Efficiency

Retrofitting listed buildings should take into account the construction of the building and ensure the aesthetic character is maintained. Certain retrofit strategies designed for modern construction may not be appropriate for historic and traditional buildings. Generally any material change to a listed building will require listed building consent which will include most retrofit measures.

Overview Checklist

	Issue	Consent Required?
Energy Efficiency	Thermal Mass	Yes
	Wind Driven Ventilation	Yes
	Insulation	Sometimes
	Airtightness	Sometimes
	Solar Gain and Overheating	n/a
	Glare	n/a
On-site Low Carbon and Renewable Energy	Solar Photovoltaic and Thermal	Yes
	Ground Source Heat Pumps	Yes
	Air Source Heat Pumps	Yes
	Biomass	Yes
	Wind Energy	Yes
	Energy Storage	Yes

Standards

The Building Regulations: existing buildings are not generally required to be brought up to newer building regulations standards. However, existing buildings, or parts of existing buildings, may need to comply with certain aspects of building regulations in certain circumstances such as when renovating/ replacing walls, floors or roofs, adding an extension and replacement windows or boilers (controlled fitting and controlled service). More information is available in the Manual to the Building Regulations.

Responsible retrofit should deliver net reductions in energy use, at minimal environmental impact, while maintaining or improving the traditional built environment and making a positive contribution to human health[34]. The Sustainable Traditional Buildings Alliance (STBA) Whole House Approach (WHA) promotes a holistic and risk based approach to retrofit which involves:

- Considering the three areas of risk: energy, health, heritage
- Taking a whole building approach, accounting for: fabric, services, inhabitants' needs and behaviour, immediate context (weather, locality), and wider context (embodied carbon, decarbonisation of fuels), integrated for a building in balance.
- Using a joined-up process (linking assessment, design, construction, feedback)

[34] STBA: Planning responsible retrofit of traditional buildings

	Bronze	Silver	Gold
Energy Efficiency	Building Regs Compliant	STBA Whole House Plus Level (WHP)	STBA Whole House Advanced Level (WHA or Responsible Retrofit)

Technical Guidance

Insulation

Listed Building Consent is not normally required unless original building elements would require temporary removal.

Insulating suspended timber floors from below is usually preferable except where there is a historically significant surface to a ceiling below. Installation from above should only be considered where it is not possible to insulate from below.

If installation from above is required, a professional will be required to avoid damaging historic building elements (e.g. floorboards, skirting boards, door architraves).

Quilt or rigid board insulation is preferable – sprayed foams will not usually be acceptable as they are not easily reversible should future repairs be required.

Breathable materials should be used to maintain the passage of air and moisture.

If lifting floorboards reveals 'deafening' material, this should be left in place, as it can be an efficient fire retardant.

Airtightness

Listed Building Consent **is not normally required**, unless the appearance of the room would be significantly affected.

Draughtproofing Skirting Boards, Ceilings and Flues

Any mastic-type draught proofing should be as discreet as possible in colour (i.e. clear, or matching the surrounding colour as closely as possible)

Skirting boards: Care should be taken if temporary removal of skirting boards is required.

Flues: temporarily sealing of unused flues is also a simple process that does not require consent – chimney balloons are simple to fit and are removable. Typically, they also permit some air flow through being ill-fitting, which is important for ventilation. Total sealing of flues is not recommended.

Draughtproofing Floors and Doors

Floors: Sealing the gaps between floorboards, traditionally referred to as caulking, is the most likely of these measures to affect appearance and can make them harder to lift in the future. If you are planning any associated works that may require lifting of floorboards these should be done before sealing these gaps. Proprietary flexible caulking strip is an inexpensive and simple measure for draught proofing the gaps between timber floorboards. It should be noted that comprehensive eradication of natural ventilation beneath timber floors can lead to damp and decay.

Unobtrusive products should always be used and loss of historic fabric avoided.

Non-permanent solutions should be favoured where possible (e.g. laying a rug or another breathable membrane on the floor).

Professional installation will be needed for products such as rebated edge seals

Care should be taken to ensure the strength of the frame is not compromised. This is particularly the case with slender late 18th century sash windows where the timber sections are often very narrow.

Secondary Glazing

Listed Building Consent **is not normally required** for secondary glazing.

Ensure that the design is as discreet as possible and does not obscure distinctive architectural detailing, including careful alignment of any glazing bars and use of slim frames of appropriate colour. With terraced dwellings, the design should retain a sense of unity with surrounding properties.

Ensure that they will not compromise the use of existing shutters

Minimise the impact of permanent fixings required to secure the new frame

Consider fitting secondary glazing within an easily removable frame that does not require a separate subframe and will allow the use of the existing windows and, where they exist, shutters.

The secondary glazing units can be colour-finished to match the existing interior decorative scheme.

In many circumstances magnetic strip secondary glazing is likely to be consented.

Further Guidance

- Historic England (HE) Advice Note 16 : Listed building consent
- HE: Advice Note 14 - Energy Efficiency and Traditional Homes
- HE: Energy Efficiency and Historic Buildings: How to Improve Energy Efficiency
- The Sustainable Traditional Buildings Alliance (STBA) Responsible Retrofit Guidance Wheel
- HE: Energy Efficiency and Historic Buildings Secondary Glazing for Windows
- HE Traditional Windows - Their Care, Repair and Upgrading
- HE I Want to Alter My Windows
- HE Modifying Historic Windows as Part of Retrofitting Energy-Saving Measures

On-site Low Carbon and Renewable Energy

Standards

	Bronze	Silver	Gold
On-site Low Carbon and Renewable Energy	Building Regs Compliant	At least 25% Renewable Energy provided.	>50% of reliance on renewable energy

Technical Guidance

Solar Photovoltaic and Solar Thermal

Listed Building Consent is required for PV roof slates and solar panels on listed buildings and any buildings within their curtilage (built before 1948).

Guidelines for Heritage Assets:

- Panels should be located so that they are not overtly visible in short and medium distance views and in longer distance views blend, through product type into the roofscape. This can be achieved by:
- Avoiding prominent and highly visible roof slopes of primary elevations
- Considering roof slope of rear, secondary elevations
- Considering inner roof slope of double pitched, M style roof
- Avoiding reflective materials and match the colour of the existing roof covering
- Where ground mounting can be accommodated consider the setting of heritage assets, character and appearance of the conservation area and potential of below ground archaeology
- Considering that evacuated tube solar thermal systems are more visible than flat-plate panels. (However, they require less space, and can be well suited to flat roofs)

Panels located on listed buildings should:

- Avoid harm to historic fabric
- Consider the implications of the additional loading (consult a structural engineer)
- Avoid significant alteration to a roof structure
- Carefully consider the location and the impact of associated infrastructure on historic fabric and internal appearance

Further Guidance:

- HE: Energy Efficiency and Historic Buildings: Solar Electric (Photovoltaics)
- Energy Saving Trust: A comprehensive guide to solar panels

Heat Pumps

Listed Building Consent is required where it involves alterations to the listed building.

Ground Source Heat Pumps

Boreholes need to have regard to the County of Avon Act (1982) which protects the source of the Bath hot springs (contact the Council for more detailed advice)

Older properties often contain microbore pipework, which may need to be replaced as it is not usually compatible with a heat pump. Care should be taken when planning pipe runs.

When used for space heating, heat pumps work most efficiently with under-floor heating. This is unlikely to be appropriate under undisturbed, historic floor surfaces. However, where this is not the case, such as where there is a poor quality modern, replacement flooring, the installation of under floor heating may be possible. In which case it is recommended that limecrete is used which can be used in conjunction with insulation and under floor heating systems whilst allowing the transfer of moisture.

Care should be taken when drilling boreholes adjacent to any particularly fragile structure to avoid damage.

Further Guidance:

- Energy saving rust: A guide to ground source heat pumps
- Centre for Sustainable Energy (cse.org.uk): Ground source heat pumps
- HE: Installing Heat Pumps in Historic Buildings

Air Source Heat Pumps

Listed Building Consent is required for an air source heat pump.

Buildings of a traditional construction require a level of passive natural ventilation and the design of the heat pump system will need to allow for the lower levels of insulation and higher rate of ventilation.

Care should be taken to locate the external unit of an air source heat pump in a discreet location away from the principal elevation – this could include behind greenery or fencing. You can also find ducted ASHP units which can be located indoors.

If under-floor heating is not possible, radiators may be considered. In some cases, historic radiators may survive and are likely to be considered as significant elements of the interior and therefore their retention is important. Where this is not the case, new radiators should be of a discreet design and sensitively-located.

Older properties often contain microbore pipework, which may need to be carefully replaced as it is not usually compatible with a heat pump.

When used for space heating, heat pumps work most efficiently with under-floor heating. This is unlikely to be appropriate where there are significant historic floor surfaces which could be harmed from being lifted. However, where there is not the case, such as where there is already modern, replacement flooring, under floor heating may be possible. In which case, it is highly recommended that limecrete is used which can be used in conjunction with insulation and under floor heating systems whilst allowing the transfer of moisture

Further Guidance:

- HE: Installing Heat Pumps in Historic Buildings

- Centre for Sustainable Energy: Air source heat pumps

Electric Vehicle Charging Points

Listed building consent is required if the charging point is attached to historic fabric.

Choose a discreet location for any associated equipment

Be mindful of the setting of heritage assets and the requirement to preserve or enhance the character and appearance of the conservation area

Avoid physically altering a heritage asset where possible and, where this is unavoidable, minimise the damage and loss of historic fabric.

Consult the Council's pre-application/planning advice service at the earliest opportunity to seek specialist advice.

Water Efficiency:

Listed buildings or buildings in conservation areas are not exempt from complying with building regulations. However, the special needs of historic buildings are recognised in some of the building regulations' approved documents. Approved Document G addresses sanitation, hot water safety and water efficiency and includes the following pertaining to historic buildings:

'Special considerations may apply if the building on which the work is to be carried out has special historic or architectural value, and compliance with the sanitation or hot water safety requirements would unacceptably alter the character or appearance of the building or part of it.

'When undertaking work on or in connection with buildings with special historic or architectural value, the aim should be to improve sanitation and hot water safety where and to the extent that it is possible provided that the work does not prejudice the character of the host building or increase the risk of long-term deterioration to the building's fabric or fittings.

'In arriving at a balance between historic building conservation and sanitation or hot water safety requirements, it would be appropriate to take into account the advice of the local authority's conservation officer before work begins.'

Rainwater Harvesting

Listed Building Consent **is required** for rainwater harvesting systems and support will be given to sensitively detailed schemes. The alternative DIY rainwater harvesting option of simply using water butts or buckets to collect and recycle water does not require listed building consent.

Further Guidance:

- UK Rainwater Management Association (ukrma.org)

Greywater systems

Listed building Consent **is required** for grey water harvesting systems in listed buildings.

Further Guidance:

- Greywater for domestic users: an information guide (sswm.info)

Appendix A - Major Residential Application

Introduction

Major Residential Applications are schemes that include 10+ dwellings. Larger schemes should consider Low carbon and renewable energy generation on a larger scale. Schemes that include site wide energy generation will be considered more favourably.

Overview Checklist

	Bronze	Silver	Gold
Passive Design and Energy Efficiency	Design & access statement demonstrating compliance with national and local polices and the building regulations	Future Homes Standard (or equivalent)	Passivhaus / LETI standard (or equivalent)
On-site Low Carbon and Renewable Energy	Building regs compliant	At least 20% Renewable Energy provided.	50% or more reliance on renewable energy
Sustainable Transport	Transport statement/ assessment & Travel plan Demonstrating suitable site access and prioritisation of public transport. Car & cycle parking provision in accordance with NHDC's Parking SPD	Additionally Seek to achieve 50% sustainable travel by including elements such as: Car clubs/ ride sharing schemes Community transport schemes Cycle hire schemes	Also includes segregated cycle ways, pedestrian paths, away from motor traffic and integrated with green infrastructure Ensure every home is within short walking (5-10 mins) distance from a bus stop. Incorporate a digital Mobility as a Service (MaaS) system providing real-time access to a range of public and private transport options such hail a ride bus service.
Air Quality	Air quality impact assessment demonstrating appropriate mitigation measures to address	Includes measures prioritising sustainable and active travel and EV charging points (see Sustainable Transport)	Includes air quality improvement strategy – e.g through GI

	air pollution during all phases of development. Assessment must also demonstrate that the development would not lead to deterioration in AQMAs		provision/ Tree planting and separation from mortised traffic.
Waste **Site waste management plan (SWMP)**	Demonstrating recycling of 10% of non-hazardous construction waste – diverting it from landfill	25% or more waste diverted from landfill	50% or more construction waste diverted from landfill – e.g. by utilising mobile recycling plan on site
Materials **Reclaimed materials** **Low carbon alternatives** **Locally sourcing**	Timber used is sourced from sustainable sources ideally locally grown or FSC certified.	Plus Significant proportion of reclaimed materials used in construction	& use of low carbon alternative construction materials such as low carbon bricks and green concrete straw bales or 'hempcrete'
Whole Life Carbon Assessment (WLC) including post construction assessment	Includes WLC assessment See template	& achieves following scores A1-A5 score <850 B-C (excl. B6&B7) score <350 A-C (excl. B6&B7) score <1200	A1-A5 score <500 B-C (excl. B6&B7) score <300 A-C (excl. B6&B7) score <800
Land use & Wildlife **Ecological survey** **Management plan with mitigation and monitoring measures**	identifying any priority habitat protected / priority species establishing potential impacts. (BS42020 or Biodiversity Metric 4.0) Submission of management plan assessing impact on wildlife and demonstrating appropriate mitigation measures and monitoring	& includes wildlife housing (bats, bees, newt ponds) and creation of wildlife network. & includes measures to improve habitat and wildlife	& links to strategic GI network plus restoration of natural river/ waterbody courses seeking to enhance waterbody quality where appropriate.

Biodiversity net gain (BNG)	Biodiversity Net gain reporting (as per HNC Developer Contributions SPD) demonstrating 10% BNG	Greater than 10% BNG	Over 30% BNG
Development in vicinity of nationally / locally designated sites	Impact assessment demonstrating adequate mitigation with no residual adverse effects on designated biodiversity sites	Plus 12m complimentary habitat buffers around locally and nationally designated sites.	Plus LWS Enhancement strategy (where appropriate/ applicable) In addition to standard requirements
Green Infrastructure/	Provide open space enhancement and management plan. Loss of open space to be replaced by equivalent or higher quality provision.	Plus well designed GI based on Natural England's GI Principles (see Green Infrastructure)	Additionally GI provision links to strategic GI networks in wider District.
Open space provision	As per NHDC open space standards	Open space provision also seeks to: Enhance nature depleted areas Includes features to enhance to biodiversity e.g. such as copses, ponds, ditches, rough area.	Open space sites link to local and / or strategic green corridors (GI) seeking to compliment the Nature Recovery Network by providing habitat connectivity.
Water efficiency standard within new dwellings (See Water Use)	110 lpd	Less than 110 lpd	80 lpd
Adaptation to Climate Change: **Surface water drainage strategy**	Surface water run-off is managed as close to its source as possible with a SuDS strategy and a maintenance plan. Demonstrates that scheme will not increase downstream flood risk. Scheme must achieve	SuDS strategy in accordance with DEFRA's non-statutory SuDS technical standards Runoff volumes from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event.	SuDS strategy also addresses the 4 pillars of SuDS achieving better than greenfield (pre-development) run off rates. System will not discharge to combined sewers.

	greenfield run-off rates. Where this is demonstrably not feasible, a minimum 50% reduction will be required.		

Appendix B Minor Residential Applications

Minor Residential development includes all new developments and residential conversions of one or more dwellings and less than ten dwellings.

Overview Checklist

	Bronze	Silver	Gold
Passive Design and Energy Efficiency	Design & access statement demonstrating compliance with national and local polices and the building regulations	Future Homes Standard (or equivalent)	Passivhaus / LETI standard
On-site Low Carbon and Renewable Energy	Building regs compliant	At least 20% Renewable Energy provided.	50% or more reliance on renewable energy
Sustainable Transport	Transport statement/ assessment & Travel plan Demonstrating suitable site access and prioritisation of public transport. Car & cycle parking provision in accordance with NHDC's Parking SPD	Additionally Seek to achieve 50% sustainable travel by including elements such as: Car clubs/ ride sharing schemes Community transport schemes Cycle hire schemes	Also includes segregated cycle ways, pedestrian paths, away from motor traffic and integrated with green infrastructure Ensure every home is within short walking (5-10 mins) distance from a bus stop. Incorporate a digital Mobility as a Service (MaaS) system providing real-time access to a range of public and private transport options such hail a ride bus service.
Air Quality Air quality impact assessment	Demonstrating appropriate mitigation measures to address air pollution during all phases of development. & Would not lead to deterioration in AQMAs	Includes measures prioritising sustainable and active travel and EV charging points (see Transport)	Includes air quality improvement strategy – e.g through GI provision/ Tree planting and separation from mortised traffic.

Waste Site waste management plan (SWMP)	Demonstrating recycling of 10% of non-hazardous construction waste – diverting it from landfill	25% or more waste diverted from landfill	50% or more construction waste diverted from landfill – e.g. by utilising mobile recycling plan on site
Materials Reclaimed materials Low carbon alternatives Locally sourcing	Timber used is sourced from sustainable sources ideally locally grown or FSC certified.	Plus Significant proportion of reclaimed materials used in construction	& use of low carbon alternative construction materials such as low carbon bricks and green concrete straw bales or 'hempcrete'
Whole Life Carbon Assessment (WLC) including post construction assessment	Includes WLC assessment See template	& achieves following scores A1-A5 score <850 B-C (excl B6&B7) score <350 A-C (excl B6&B7) score <1200	A1-A5 score <500 B-C (excl B6&B7) score <300 A-C (excl B6&B7) score <800
Land use & Wildlife Ecological survey Management plan with mitigation and monitoring measures	identifying any priority habitat protected / priority species establishing potential impacts. (BS42020 or Biodiversity Metric 4.0) Submission of management plan assessing impact on wildlife and demonstrating appropriate mitigation measures and monitoring	& includes wildlife housing (bats, bees, newt ponds) and creation of wildlife network. & includes measures to improve habitat and wildlife	& links to strategic GI network plus restoration of natural river/ waterbody courses seeking to enhance waterbody quality where appropriate.
Biodiversity net gain (BNG)	Biodiversity Net gain reporting (as per HNC Developer Contributions SPD) demonstrating 10% BNG	Greater than 10% BNG	Over 30% BNG

Development in vicinity of nationally / locally designated sites	Impact assessment demonstrating adequate mitigation with no residual adverse effects on designated biodiversity sites	Plus 12m complimentary habitat buffers around locally and nationally designated sites.	Plus LWS Enhancement strategy (where appropriate/ applicable) In addition to standard requirements
Green Infrastructure/	Provide open space enhancement and management plan. Loss of open space to be replaced by equivalent or higher quality provision.	Plus well designed GI based on Natural England's GI Principles (see Green Infrastructure)	Additionally GI provision links to strategic GI networks in wider District.
Water efficiency standard within new dwellings (See Water Use)	110 lpd	110 – 80 L	< 80 lpd
Adaptation to Climate Change: Surface water drainage strategy	Surface water run-off is managed as close to its source as possible with a SuDS strategy and a maintenance plan. Demonstrates that scheme will not increase downstream flood risk. Scheme must achieve greenfield run-off rates. Where this is demonstrably not feasible, a minimum 50% reduction will be required.	SuDS strategy in accordance with DEFRA's non-statutory SuDS technical standards Runoff volumes from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event.	SuDS strategy also addresses the 4 pillars of SuDS achieving better than greenfield (pre-development) run off rates. System will not discharge to combined sewers.

Appendix C Major Non-Residential Applications

Major Non-Residential development includes all new non-residential development which either provides additional floor space of at least 1,000sqm or is on a development site of at least 0.5ha.

Overview Checklist

	Bronze	Silver	Gold
Passive Design and Energy Efficiency	Building regs compliant	Passivhaus or LETI standard or equivalent	BREEAM 'Outstanding' or equivalent
On-site Low Carbon and Renewable Energy	Building regs compliant	At least 20% Renewable Energy provided.	50% or more reliance on renewable energy
Sustainable transport	Transport statement/ assessment (see Table C2) & Travel plan Demonstrating suitable site access and prioritisation of public transport. Car & cycle parking provision in accordance with NHDC's Parking SPD	Additionally Seeks to achieve 30% sustainable travel by including elements such as: Car clubs/ ride sharing schemes Community transport schemes Cycle hire schemes	Also includes segregated cycle ways, pedestrian paths, away from motor traffic and integrated with green infrastructure Ensure development is within short walking (5-10 mins) distance from a bus stop. Incorporate a digital Mobility as a Service (MaaS) system providing real-time access to a range of public and private transport options such hail a ride bus service. Site parking to include solar/PV car ports.

Air Quality **Air quality impact assessment**	Demonstrating appropriate mitigation measures to address air pollution during all phases of development. & Would not lead to deterioration in AQMAs	Includes measures prioritising sustainable and active travel and EV charging points (see EV Charging section below)	Includes air quality improvement strategy – e.g through GI provision/ Tree planting and separation from mortised traffic.
Waste **Site waste management plan (SWMP)**	Demonstrating recycling of 10% of non-hazardous construction waste – diverting it from landfill	25% or more waste diverted from landfill	50% or more construction waste diverted from landfill – e.g. by utilising mobile recycling plan on site
Materials **Reclaimed materials** **Low carbon alternatives** **Locally sourcing**	Timber used is sourced from sustainable sources ideally locally grown or FSC certified.	Plus Significant proportion of reclaimed materials used in construction	& use of low carbon alternative construction materials such as low carbon bricks and green concrete straw bales or 'hempcrete'
Whole Life Carbon Assessment (WLC) including post construction assessment	Includes WLC assessment See template	& achieves following scores A1-A5 score <850 B-C (excl B6&B7) score <350 A-C (excl B6&B7) score <1200	A1-A5 score <500 B-C (excl B6&B7) score <300 A-C (excl B6&B7) score <800
Land use & Wildlife **Ecological survey** **Management plan with mitigation and monitoring measures**	identifying any priority habitat protected / priority species establishing potential impacts. (BS42020 or Biodiversity Metric 4.0) Submission of management plan assessing impact on wildlife and demonstrating appropriate mitigation measures and monitoring	& includes wildlife housing (bats, bees, newt ponds) and creation of wildlife network. & includes measures to improve habitat and wildlife	& links to strategic GI network plus restoration of natural river/ waterbody courses seeking to enhance waterbody quality where appropriate.

Biodiversity net gain (BNG)	Biodiversity Net gain reporting (as per HNC Developer Contributions SPD) demonstrating 10% BNG	Greater than 10% BNG	Over 30% BNG
Development in vicinity of nationally / locally designated sites	Impact assessment demonstrating adequate mitigation with no residual adverse effects on designated biodiversity sites	Plus 12m complimentary habitat buffers around locally and nationally designated sites.	Plus LWS Enhancement strategy (where appropriate/ applicable) In addition to standard requirements
Green Infrastructure/	Provide open space enhancement and management plan. Loss of open space to be replaced by equivalent or higher quality provision.	Plus well designed GI based on Natural England's GI Principles (see Green Infrastructure)	Additionally GI provision links to strategic GI networks in wider District.
Open space provision	As per NHDC open space standards	Open space provision also seeks to: Enhance nature depleted areas Includes features to enhance to biodiversity e.g. such as copses, ponds, ditches, rough area.	Open space sites link to local and / or strategic green corridors (GI) seeking to compliment the Nature Recovery Network by providing habitat connectivity.
Water efficiency standard within new dwellings (See Water Use)	As per policy and building requirements	Achieves water efficiency standard of 2 credits for category Wat 01 of BREEAM	Achieves full credits for category Wat 01 of BREEAM
Adaptation to Climate Change: **Surface water drainage strategy**	Surface water run-off is managed as close to its source as possible with a SuDS strategy and a maintenance plan. Demonstrates that scheme will not increase downstream flood risk. Scheme must achieve greenfield run-off rates. Where this is demonstrably not feasible, a minimum 50% reduction will be required.	SuDS strategy in accordance with DEFRA's non-statutory SuDS technical standards Runoff volumes from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event.	SuDS strategy also addresses the 4 pillars of SuDS achieving better than greenfield (pre-development) run off rates. System will not discharge to combined sewers.

Electric Vehicle Charging Points

Table C1 sets out NHDC's EV charging requirements which exceeds the Building Regulations, demonstrating NHDC's commitment to maximising the opportunity to develop cleaner and greener modes of travel. It also seeks to support the implementation of an electric vehicle (EV) charging network to help to make EVs more accessible.

The below applies to non-residential development, such as commercial, education and leisure development. In non-residential uses the amounts and types of EV chargers will need to reflect the users. For example, employees who are on site for several hours can use standard chargers, but users visiting for a short time will benefit from rapid charging.

Table C1: Provision of EV Charging Points in Non-residential New Development

Land Use	EV Requirements	Minimum Nominal Rated Output
Supermarkets / retail Areas **Use Class F2 and E**	10% of parking spaces with active provision and an additional 20% of parking spaces with passive provision for EV charge points. For Supermarkets/retail/developments with high turnover of parking, provision should be made for rapid charging, due to a short dwell time (e.g. one hour maximum stay).	A range of fast (7.4kW or greater) chargers. At least one rapid charger of at least 43kW as a minimum unless it can be demonstrated why this is not necessary.
Employment sites **Use Classes B2, B8, C1, C2,** **C2(a), E, F1, F2 and Sui Generis as appropriate**	20% of parking spaces with active provision and an additional 20% of parking spaces with passive provision. For employment developments with high turnover of parking, provision should be made for rapid charging, due to a short dwell time (e.g. one hour maximum stay).	7.4kW minimum. At least one rapid charger of at least 43kW as a minimum, unless it can be demonstrated why this is not necessary.
Health and Leisure Developments **Use Class F2 and Sui Generis**	10% of parking spaces with active provision and an additional 20% of parking spaces with passive provision. For health and leisure developments with high turnover of parking, provision should be made for rapid charging, due to a short dwell time (e.g. one hour maximum stay).	A range of fast (7.4kW or greater) chargers. At least one rapid charger of at least 43kW as a minimum, unless it can be demonstrated why this is not necessary.

Education facilities, including Universities Use Class F1	20% of parking spaces with active provision and an additional 20% of parking spaces with passive provision. For education facilities developments with high turnover of parking, provision should be made for rapid charging, due to a short dwell time (e.g. one hour maximum stay).	7.4kW minimum. At least one rapid charger of at least 43kW as a minimum, unless it can be demonstrated why this is not necessary.
Other Uses	Individual case basis	7.4kW minimum.
Designated staff parking associated with any non-residential new development	20% of parking spaces with active provision and an additional 20% of parking spaces with passive provision.	7.4kW minimum.
Disabled parking within any non-residential new development	A minimum of one space with active provision. Where more than one space is provided the % set out above (by land use) should apply to all additional spaces. Where this calculation does not result in a whole number the value should be rounded up to the next whole number.	7.4kW minimum.

Table C2 Non residential development requiring transport assessments.

Land Use
• Retail development > 2000m^2
• Development class B1, B2 or B8 of > 2000m^2
• Developments for sports centres, leisure facilities, golf courses and practice ranges.
• Where traffic levels to and from the proposed development are likely to exceed 5% of the two way traffic flow on the adjoining highway from which it takes access
• Where traffic congestion exists or will exist within the assessment period; and
• In sensitive locations such as adjacent or close to traffic lights or roundabout junctions.

Parking Management

In some cases parking arising from development will require measures to be put in place to manage the impact of parking on the public highway. This includes physical protection against parking (i.e. on verges) or protection via Traffic Regulation Orders against short/long stay parking at inappropriate locations (i.e. at junctions, in locations that may conflict with pedestrian movements). All parking management required as a result of new development must be provided by the developer and should have regard to the Council's Parking Strategy and other parking management in the area.

Neighbourhood EV Charging Hubs

On large and strategic sites in addition to the requirements set out in Table C1, would like developers to consider providing additional public charging at ultra-rapid charging hubs, allowing quick turnaround times. Charging hubs are located in off-street car parks, where they are readily accessible. EV charging hubs can be especially valuable for areas with apartments or retail and employment centres

Appendix D Minor Non-residential Applications

Minor Non-Residential development includes all new non-residential development which provides additional floor space above 250sqm but below 1,000sqm of floor space and on a development site below 0.5ha.

	Bronze	Silver	Gold
Passive Design and Energy Efficiency	Building regs compliant	Passivhaus or LETI standard or equivalent	BREEAM 'Outstanding' or equivalent
On-site Low Carbon and Renewable Energy	Building regs compliant	At least 20% Renewable Energy provided.	50% or more reliance on renewable energy
Sustainable Transport	Transport statement/ assessment & Travel plan Demonstrating suitable site access and prioritisation of public transport. Car & cycle parking provision in accordance with NHDC's Parking SPD	Additionally Seeks to achieve 30% sustainable travel by including elements such as: Car clubs/ ride sharing schemes Community transport schemes Cycle hire schemes	Also includes segregated cycle ways, pedestrian paths, away from motor traffic and integrated with green infrastructure Ensure development is within short walking (5-10 mins) distance from a bus stop. Incorporate a digital Mobility as a Service (MaaS) system providing real-time access to a range of public and private transport options such hail a ride bus service. Site parking to include solar/PV car ports.

Air Quality **Air quality impact assessment**	Demonstrating appropriate mitigation measures to address air pollution during all phases of development. & Would not lead to deterioration in AQMAs	Includes measures prioritising sustainable and active travel and EV charging points (see Transport)	Includes air quality improvement strategy – e.g through GI provision/ Tree planting and separation from mortised traffic.
Waste **Site waste management plan (SWMP)**	Demonstrating recycling of 10% of non-hazardous construction waste – diverting it from landfill	25% or more waste diverted from landfill	50% or more construction waste diverted from landfill – e.g. by utilising mobile recycling plan on site
Materials **Reclaimed materials** **Low carbon alternatives** **Locally sourcing**	Timber used is sourced from sustainable sources ideally locally grown or FSC certified.	Plus Significant proportion of reclaimed materials used in construction	& use of low carbon alternative construction materials such as low carbon bricks and green concrete straw bales or 'hempcrete'
Whole Life Carbon Assessment (WLC) including post construction assessment	Includes WLC assessment See template	& achieves following scores A1-A5 score <850 B-C (excl B6&B7) score <350 A-C (excl B6&B7) score <1200	A1-A5 score <500 B-C (excl B6&B7) score <300 A-C (excl B6&B7) score <800
Land use & Wildlife **Ecological survey** **Management plan with mitigation and monitoring measures**	identifying any priority habitat protected / priority species establishing potential impacts. (BS42020 or Biodiversity Metric 4.0) Submission of management plan assessing impact on wildlife and demonstrating appropriate mitigation measures and monitoring	& includes wildlife housing (bats, bees, newt ponds) and creation of wildlife network. & includes measures to improve habitat and wildlife	& links to strategic GI network plus restoration of natural river/ waterbody courses seeking to enhance waterbody quality where appropriate.

Biodiversity net gain (BNG)	Biodiversity Net gain reporting (as per HNC Developer Contributions SPD) demonstrating 10% BNG	Greater than 10% BNG	Over 30% BNG
Development in vicinity of nationally / locally designated sites	Impact assessment demonstrating adequate mitigation with no residual adverse effects on designated biodiversity sites	Plus 12m complimentary habitat buffers around locally and nationally designated sites.	Plus LWS Enhancement strategy (where appropriate/ applicable) In addition to standard requirements
Green Infrastructure/	Provide open space enhancement and management plan. Loss of open space to be replaced by equivalent or higher quality provision.	Plus well designed GI based on Natural England's GI Principles (see Green Infrastructure)	Additionally GI provision links to strategic GI networks in wider District.
Open space provision	As per NHDC open space standards	Open space provision also seeks to: Enhance nature depleted areas Includes features to enhance to biodiversity e.g. such as copses, ponds, ditches, rough area.	Open space sites link to local and / or strategic green corridors (GI) seeking to compliment the Nature Recovery Network by providing habitat connectivity.
Water efficiency standard within new dwellings (See Water Use)	As per policy and building requirements	Achieves water efficiency standard of 2 credits for category Wat 01 of BREEAM	Achieves full credits for category Wat 01 of BREEAM
Adaptation to Climate Change: **Surface water drainage strategy**	Surface water run-off is managed as close to its source as possible with a SuDS strategy and a maintenance plan. Demonstrates that scheme will not increase downstream flood risk. Scheme must achieve greenfield run-off rates. Where this is demonstrably	SuDS strategy in accordance with DEFRA's non-statutory SuDS technical standards Runoff volumes from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the	SuDS strategy also addresses the 4 pillars of SuDS achieving better than greenfield (pre-development) run off rates. System will not discharge to combined sewers.

	not feasible, a minimum 50% reduction will be required.	greenfield runoff volume for the same event.	

Appendix E Domestic extensions, outbuildings & other minor operations

Under the Town and Country Planning (General Permitted Development) (England) Order 2015. Householders can alter their properties without the need for a full planning application. This is known as 'Permitted Development' rights.

For formal confirmation that a proposal would be lawful and would not require planning permission, an application for a Lawful Development Certificate can be made.

Overview Checklist

	Bronze	Silver	Gold
Passive Design and Energy Efficiency	Design & access statement demonstrating compliance with national and local polices and the building regulations	Future Homes Standard (or equivalent)	Passivhaus / LETI standard (including retrofitting existing part of building)
Sustainable Transport	Car & cycle parking provision in accordance with NHDC's Parking SPD		
Waste Site waste management plan (SWMP)	Demonstrating recycling of 10% of non-hazardous construction waste – diverting it from landfill	25% or more waste diverted from landfill	50% or more construction waste diverted from landfill – e.g. by utilising mobile recycling plan on site
Materials Reclaimed materials Low carbon alternatives Locally sourcing	Design based on natural, sustainable materials that incorporate insulation and good passive solar design. Timber used is sourced from sustainable sources ideally locally grown or FSC certified.	Plus Significant proportion of reclaimed materials used in construction	& use of low carbon alternative construction materials such as low carbon bricks and green concrete straw bales or 'hempcrete'

Land use & Wildlife Ecological survey Management plan with mitigation and monitoring measures	identifying any priority habitat protected / priority species establishing potential impacts.	Demonstrate how biodiversity has bene enhanced e.g. through planting, wildlife housing (bats, bees, newt ponds)	
Water efficiency standard within new dwellings (See Water Use)	Demonstrate how development minimises water use through installation of efficient appliances (e.g. A+++ white goods/ boilers)	Demonstrate integrated rainwater harvesting – e.g. through the use of water butts, blue roofs and rainwater harvesting including private rainwater collection and reuse points.	Additionally include water recycling systems such as a grey water system.
Adaptation to Climate Change: Surface water drainage strategy	Surface water run-off is managed as close to its source as possible with a SuDS strategy and a maintenance plan. Demonstrates that scheme will not increase downstream flood risk. Scheme must achieve greenfield run-off rates. Where this is demonstrably not feasible, a minimum 50% reduction will be required.		

Appendix F Summary of requirements by devleopment type

Contact / Consider	Major residential development	Minor residential development	Major non residential	Minor non residential	Minor operations
Sustainability SPD	✓	✓	✓	✓	✓
Planning Permission	✓	✓	✓	✓	✓
Building Control	✓	✓	✓	✓	✓
Environmental Health	✓	✓	✓	✓	✓
Public Rights of Way	✓	✓	✓	✓	✓
Site Appraisal	✓	✓	✓	✓	
Re-use of Buildings	✓	✓	✓	✓	✓
Reclamation of Materials	✓	✓	✓	✓	✓
Sustainable Construction	✓	✓	✓		✓
Construction Waste Management	✓	✓	✓	✓	✓
Building Materials	✓	✓	✓	✓	✓
Building Layout	✓	✓	✓	✓	✓
Sustainable Energy Use	✓	✓	✓	✓	✓
Passive Solar Energy	✓	✓	✓	✓	✓
Natural Ventilation	✓	✓	✓	✓	✓
Insulation	✓	✓	✓	✓	✓
Heating	✓	✓	✓	✓	✓
Renewable Energy	✓	✓	✓	✓	✓
Water Management	✓	✓	✓	✓	
Water efficiency measures	✓	✓	✓		
Water Re-use	✓	✓	✓		
Drainage	✓	✓	✓	✓	✓