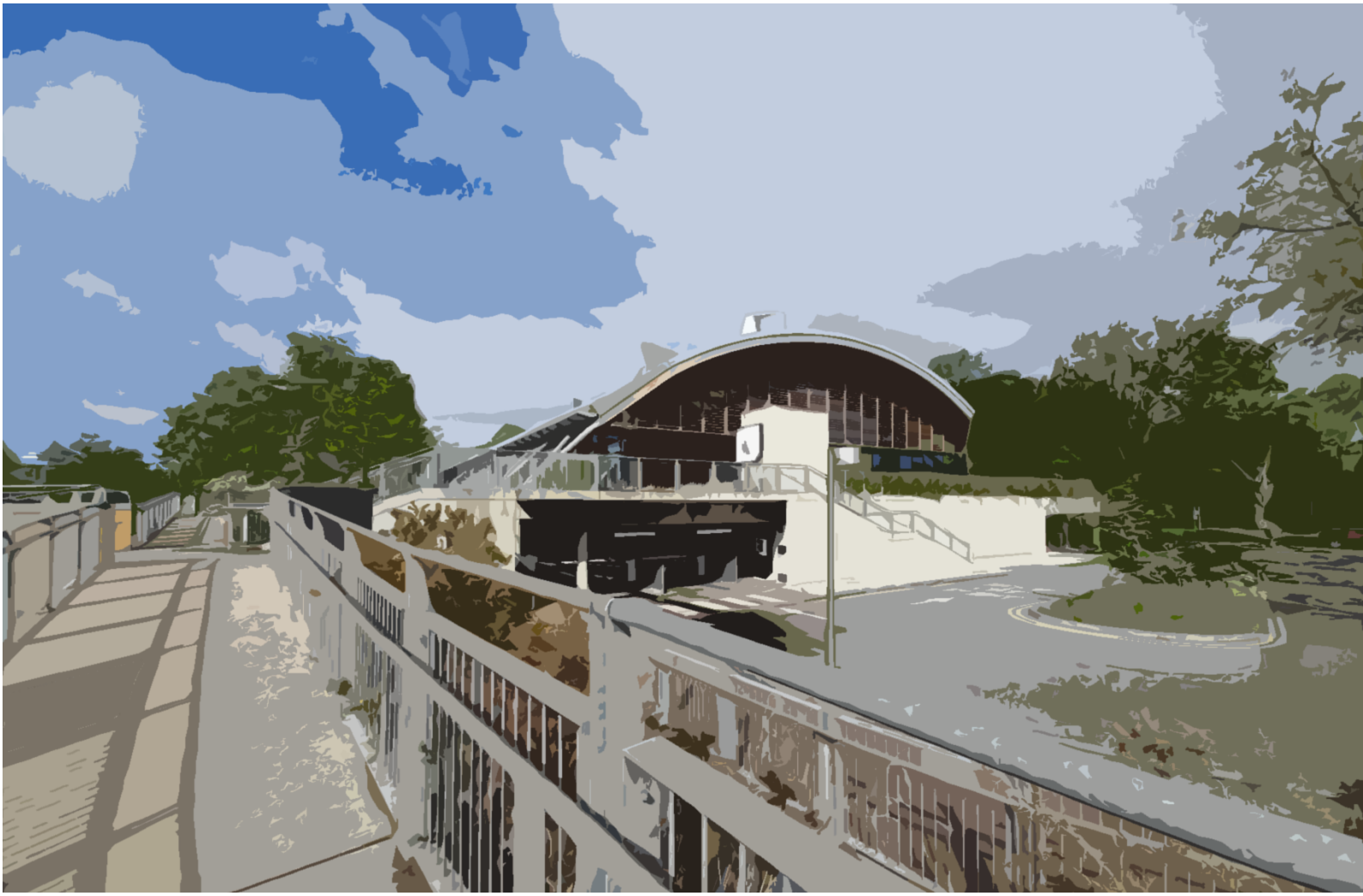
Woking Borough Council

Climate Change

Supplementary Planning Document (SPD)



WSP Environment & Infrastructure Solutions UK Limited – October 2023

Report for

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Document revisions

No.	Details	Date
0	Draft for internal review	12/12/2022
1	Draft for client comment	04/01/2023
2	Revised draft	25/01/2023
3	Handover draft to WBC	21/02/2023
4	Public consultation	18/05/2023

Executive Summary

Climate change is regarded as one of the most significant threats of our times and increasing focus is being paid to mitigating and adapting for the future. Actions on climate change are being taken at all levels of the planning system, from international agreements and national targets to local planning commitments and strategies for individual developments.

This Climate Change Supplementary Planning Document (SPD), updates and builds upon the previous 2013 Climate Change SPD, reflecting changes in national or local policy and objectives, ensuring sustainable outcomes through the planning system.

Woking Borough Council declared a 'climate and ecological emergency' in 2019 and adopted a Climate Emergency Action Plan (CEAP) in 2020 which set out a range of priority actions, including the need to update local guidance to reflect how development can be adapted to encourage the adoption of low or zero carbon technologies.

It is important to recognise that while the Council is committed toward achieving net-zero, for the purposes of planning policy guidance and ensuring development remains viable, development should endeavour to achieve carbon neutrality as supported under Policy CS22 of the Core Strategy. This SPD details technologies that are considered 'best practice' and proposals which go beyond energy efficiency standards are encouraged. To clarify net-zero means no GHG (greenhouse gas) emissions are released, whereas carbon neutrality means GHG emissions that are released are then offset elsewhere to maintain a balance of both released and eliminated gases.

The way in which we shape new and existing communities in the Borough can make a significant contribution to tackling climate change, both by building resilience to its impacts and by reducing carbon emissions. Spatial planning plays a key role in mitigating and adapting to climate change through decision-making on the location, scale, mix and character of development. Therefore, it is imperative that new housing and developments brought forward meet and exceed performance requirements of the Core Strategy, utilising the guidance in this SPD, to ensure further buildings are not 'locked in' and require costly retrofitting in the future. This SPD sets out the specific detail and information required by the Council to determine whether development proposals align with local needs whilst addressing the challenges of a changing climate.

The following two pages summarise the recommendations for both residential and non-residential buildings, illustrating the key measures for addressing climate change. **Sections 4** to **7** provide the detailed guidance relevant to Woking Borough Council's climate change policies.

Residential Development

Carbon and Sustainable Energy

Apply the energy hierarchy to any new development, adopting a 'fabric first' approach (see **Table 4.1**).

Developments are encouraged to exceed minimum local planning policy and Building Regulations Part L requirements.

Sources of renewable / LZC power should be considered. Review design issues and planning requirements associated with these technologies.

Consider opportunities and constraints associated with stand-alone sustainable energy generation – see **Table 4.3.**

All new buildings should utilise low carbon heat for heating and hot water.

Connect to Woking Town Centre DEN if within proximity (see **Figure 4.2**)

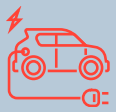
Sustainable Transport

Designs should prioritise walking, cycling and public transport. Provide strong links to existing footpaths, cycle routes and public transport nodes.

Secure and covered cycle parking should be located close to a property, with appropriate provision provided based on occupancy

Certain developments (major development or highly disruptive to transport) will be required to conduct Transport Assessments and provide Travel Plans to manage travel needs sustainably (see **Box 6.2**).

Provision of car parking should be consistent with cutting emissions, including through providing for EV charging infrastructure.



Meet the minimum requirements for the provision of EV charge points in accordance with the current Building Regulations Part S (see **Table 6.2**)

Residential Development

Design, Materials and Waste

To maximise passive solar gain, buildings should be oriented with the longest façade being south facing (+/- 30°) – see **Figure 5.1**. Good integrated design will also avoid summertime overheating.

Glazing-to-wall ratio on each façade is a key feature of energy efficient design.

Reduce the amount of resources used and the waste produced. Use recycled, re-used and / or local, sustainably sourced materials.

The selection of materials should be informed by the scale of embodied carbon associated with their production.

Provide high-quality waste facilities. Part H6 of the Building Regulations sets minimum requirements in relation to provision for solid waste storage.

Applications for large scale development should be accompanied by a Site Waste Management Plan (SWMP).

Climate Change Resilience and Adaptation

Overheating assessment to design for future climate, employing principles of the natural cooling measures (see **Table 7.1**) in order to future-proof the development

Designing development to be resilient to flood risk including allowances for climate change.

Use of SuDS in development to integrate GBI and design for allowances for climate change, utilising the principles within **Table 7.1.**

Design for a minimum water efficiency of 110 l/p/d, aiming to exceed this, utilising the principles of the water hierarchy (see **Figure 7.2**).

Integrate GBI into development, utilising nature-based solutions to achieve multiple benefits.

Non-residential Development

Carbon and Sustainable Energy

Apply the energy hierarchy to any new development, adopting a 'fabric first' approach (see **Table 4.1**).

Developments are encouraged to exceed minimum local planning policy and Building Regulations Part L requirements. For developments with high energy consumption – include three credits from BREEAM Ene04.

Sources of renewable / LZC power should be considered. Early-stage review design issues and planning requirements associated with these technologies.

Consider opportunities and constraints associated with stand-alone sustainable energy generation – see **Table 4.3**.

All new buildings should utilise low carbon heat for heating and hot water.

Connect to Woking Town Centre DEN if within proximity (see **Figure 4.2).**

Sustainable Transport

Designs should prioritise walking, cycling and public transport. Provide strong links to existing footpaths, cycle routes and public transport nodes.

Secure and covered cycle parking should be located close to a property, with appropriate provision provided based on occupancy

Certain developments (major development or highly disruptive to transport) will be required to conduct Transport Assessments and provide Travel Plans to manage travel needs sustainably (see **Box 6.2**).

Provision of car parking should be consistent with cutting emissions, including through providing for EV charging infrastructure.

Meet the minimum requirements for the provision of EV charge points in accordance with the current Building Regulations Part S (see **Table 6.2**)

Non-residential Development

Design, Materials and Waste

To maximise passive solar gain, buildings should be oriented with the longest façade being south facing (+/- 30°) – see **Figure 5.1**. Good integrated design will also avoid summertime overheating.

Glazing-to-wall ratio on each façade is a key feature of energy efficient design.

Reduce the amount of resources used and the waste produced. Use recycled, re-used and / or local, sustainably sourced materials. Achieve credits from the waste and materials elements of BREEAM.

The selection of materials should be informed by the scale of embodied carbon associated with their production.

Provide high-quality waste facilities. Part H6 of the Building Regulations sets minimum requirements in relation to provision for solid waste storage.

Applications for large scale development should be accompanied by a SWMP. Some projects will require SWMPs to comply with BREEAM standards.

Climate Change Resilience and Adaptation

Thermal modelling incorporating climate change projections, incorporating the principles of natural ventilation where possible (see **Table 7.1).**

Designing for durability to climate change impacts such as heat deterioration and driving rain, including designing for ease of maintenance.

Designing development to be resilient to flood risk including allowances for climate change.

Use of SuDS in development to integrate GBI and design for allowances for climate change, utilising the principles within **Table 7.2**.

Design for a minimum of 40% reduction in water consumption compared to a baseline building (see BREEAM methodology) whilst aiming to exceed this, utilising the principles of the water hierarchy (see **Figure 7.2).**

Integrate GBI into development, utilising nature-based solutions to achieve multiple benefits.

Contents

Acronyms and Abbreviations

Acronym	Definition
BEIS	Department for Business, Energy and Industrial Strategy
BNG	Biodiversity Net Gain
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method
CCRA	Climate Change Risk Assessment
CEAP	Climate Emergency Action Plan
CfSH	Code for Sustainable Homes
CHP	Combined heat and power
CIBSE	Chartered Institution of Building Services Engineers
CLT	Cross laminated timber
CO_2	Carbon dioxide
DEN	Decentralised Energy Network
DER	Dwelling Emissions Rate
DPD	Development Plan Document
EIA	Environmental Impact Assessment
EPC	Energy Performance Certificate
EPD	Environmental Product Declaration
EV	Electric vehicle
FRA	Flood Risk Assessment
GBI	Green and Blue Infrastructure
GDPO	General Permitted Development Order
GHG	Greenhouse Gas
GWR	Greywater Recycling

Acronym	Definition
IPCC	Intergovernmental Panel on Climate Change
LDF	Local Development Framework
LNRS	Local Nature Recovery Strategies
LZC	Low and Zero Carbon
NBS	Nature Based Solutions
NDO	Neighbourhood Development Order
NDP	Neighbourhood Development Plan
NPPF	National Planning Policy Framework
PD	Permitted Development
PPG	Planning Practice Guidance
PV	Photovoltaic
RCP	Representative Concentration Pathway
RWH	Rainwater Harvesting
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area
SPD	Supplementary Planning Document
SUDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TER	Target Emissions Rate
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1 Purpose

1.1.1 The Woking Local Development Framework (LDF) Core Strategy, adopted in October 2012, sets out the overall strategic vision for the spatial planning and management of development in the Borough up to 2027. It describes a strategic vision for the Council in which sustainability is embedded in aspects of design, sustainable construction as well as renewable and low carbon energy generation. Following a review in 2018, the Core Strategy was deemed up to date and continues to provide the necessary strategic policy framework for managing development across the Borough.

1.1.2 Climate change encompasses many disparate yet interconnected topics of the Core Strategy; associated policies (where relevant) therefore inform this SPD in driving reduced carbon emissions and resource impacts (climate change mitigation) and enhanced resilience to climate change impacts (climate change adaptation). (see **Appendix A**).

1.1.3 The purpose of this SPD is to provide more detailed guidance on the application of the planning policies related to climate change, thereby helping applicants make successful applications and aiding the delivery of highly sustainable forms of development in Woking Borough. This SPD is key to ensuring sustainable outcomes through the planning system and positively contributing to the Borough's climate change and biodiversity goals.

1.1.4 The key objectives of this SPD are to ensure all new developments are:

- Designed to the highest achievable sustainability standards;
- Designed to reduce their carbon emissions and incorporate sustainable energy;
- Designed to make efficient use of natural resources, particularly water and energy;
- Designed to mitigate and adapt to the effects of climate change;
- Integrating Nature-Based Solutions into development; and,
- Designed to be future-proofed in response to socio-environmental shifts associated with climate change.

1.2 How to use this Document

1.2.1 This document provides guidance on implementing certain policies in the Core Strategy. It provides important advice on how to meet various criteria set out in the policies contained within **Table** 1.1.

Table 1.1 Core Strategy – Relevant Policies

Policy	Description	Relevance to Policy CS22 and Climate Change Objectives	Page Number
CS7	Biodiversity and nature conservation	Creation of green spaces and green infrastructure for adaptation purposes – managing risks such as flooding, high temperatures and urban heat island effect – as well as enhancing biodiversity.	Page 55

Policy	Description	Relevance to Policy CS22 and Climate Change Objectives	Page Number
CS9	Flooding and water management	Incorporation of sustainable drainage systems (SUDS) – range of benefits including flood risk management and carbon storage and sequestration.	Page 61
CS17	Open space, green infrastructure, sport and recreation	Provision of green and blue spaces and green infrastructure for adaptation purposes, as well as enhancing biodiversity.	Page 89
CS18	Transport and accessibility	Provision of sustainable transport system and modes, reducing carbon emissions and growth of green corridors for adaptation purposes.	Page 93
CS21	Design	Incorporating measures to minimise energy consumption, conserve water resources, use principles of sustainable construction and provide renewable energy and SUDS.	Page 102
CS22	Sustainable construction	Development designed to take account of layout, landform, orientation and landscaping, as well as reducing carbon emissions and incorporating adaptation measures.	Page 106
CS23	Renewable and low carbon energy generation	Generation of energy from renewable and low carbon sources.	Page 112

1.2.2 It is recommended that applicants refer to this document in the early stages of project planning and design, with cross-reference to other planning policies across the local development framework. Climate change and sustainability should be considered at the start of the design process and throughout the project lifecycle to achieve the best performance in the most economic manner.

1.2.3 It is highly recommended that the pre-application service is used to engage Woking Borough Council on the proposals with due consideration of the content within this SPD.

1.2.4 The **Executive Summary** provides overviews for both residential and non-residential buildings, illustrating the key measures for addressing climate change. **Sections 2** to **7** provide the detailed guidance to addressing Woking Borough Council's climate change policies.

1.2.5 If you are in any doubt about the guidance, or require any further clarity, please get in touch with the planning policy team at the contact details below:

- Planning Policy, Woking Borough Council, Civic Offices, Gloucester Square, Woking, Surrey, GU21 6YL
- Tel: 01483 743871
- Email: planning.policy@woking.gov.uk

1.3 Sustainability Appraisal

1.3.1 This SPD forms part of the Woking LDF. It has not been necessary to prepare a sustainability appraisal as there is no requirement to do so under current Regulations[1]. The SPD does not introduce any additional requirements beyond those set out in the LDF and therefore will not cause any significant environmental effects arising from its implementation.

[1] Section 19(5) of the planning Act 2008 removed the requirement for a Sustainability Appraisal Report to be prepared for all Supplementary Planning Documents.

2. Legislative and Policy Context

2.1 Overview

2.1.1 Local policy is informed by national commitments, that in turn reflect the UK's international commitments as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC).

2.1.2 The Climate Change Act 2008[2], provides the basis for climate action in the UK (both mitigation and adaptation). Related planning legislation sets out a duty on local planning authorities to mitigate and adapt to climate change. The National Planning Policy Framework (NPPF)[3] sets out the Government's planning policies for England and how these are expected to be applied. The UK Net Zero Strategy[4] sets out the steps the UK needs to take to achieve the target of net zero by 2050.

2.2 Borough Context

2.2.1 A number of documents have been produced by the Council which accompany this SPD which should be read in conjunction to this SPD during development planning.

Core Strategy

2.2.2 Woking Borough Council's Core Strategy[5] is the main document within the Council's Local Development Framework (LDF) and underpins all other Development Plan Documents for the Borough. The document describes a strategic vision for the Council to 2027 in which sustainability is embedded in aspects of design, sustainable construction as well as renewable and low carbon energy generation. It puts robust metrics in place for measuring performance. It continues to provide the necessary strategic policy framework for managing development across the Borough.

2.2.3 The Council is committed to reducing risks and tackling the adverse impacts of climate change through appropriately designed spatial development. The inclusion of Green and Blue Infrastructure (GBI) in new development, for example, can help to alleviate surface water run-off and reduce temperatures. There are a number of planning policies within the Core Strategy which facilitate this aim – see **Table 1.1.**

2.2.4 A review of the Core Strategy will commence in 2023, and will provide an opportunity to assess the current expectations of development within the Borough, against national policy.

[2] Climate Change Act 2008 c. 27. Available at: https://www.legislation.gov.uk/ukpga/2008/27
[3] Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf
[4] Department for Business, Energy & Industrial Strategy (2021). Net Zero Strategy: Build Back Greener. Available at: https://www.gov.uk/government/publications/net-zero-strategy
[5] Woking Borough Council (2012). Woking Local Development Framework Core Strategy. Available at: https://www.woking2027.info/developmentplan/corestrategy/adoptedcorestrategy.pdf

Development Management Policies Development Plan Document

2.2.5 The Woking Development Management Policies DPD[6] was adopted by the Council in October 2016 and subject to review in October 2021[7]. The provisions of the DPD will be given full weight for the purposes of development management and other planning decisions. The main purpose of the DPD is to provide detailed policies to help determine day to day planning applications. This facilitates the delivery of the Woking Core Strategy. The policies of the DPD are areas of policy where further detail was needed beyond that contained in the Core Strategy. The DPD does not cover policy areas where principles are fully addressed by national or Core Strategy policies. It provides further information of relevance to this SPD, relating to climate adaptation, specifically Flood Risk Assessments (FRA) and green infrastructure requirements.

Natural Woking: Biodiversity and Green Infrastructure Strategy

2.2.6 The Biodiversity and Green Infrastructure Strategy[8] was introduced by Woking Borough Council in 2016 to promote the Borough's biodiversity whilst enhancing existing habitats and green spaces and improve accessibility. This strategy works alongside the Borough's Climate Change Strategy and identifies the role of the developer and landowners as essential in achieving these objectives.

Woking Strategic Flood Risk Assessment

2.2.7 The Strategic Flood Risk Assessment (SFRA)[86], produced in 2015, has been prepared in accordance with the NPPF and PPG, where the SFRA sets out suitable, reasonable and practical local development policies to manage flood risk. The SFRA provides an assessment of the impacts of climate change and provides guidance to developers on designing for climate change.

Design SPD

2.2.8 The Design SPD[24] was adopted by the Council in February 2015 and is a material consideration in the determination of planning applications. It provides detailed guidance to ensure that future development in the Borough is of the highest design standards, which will have a direct bearing on minimising the impact of development on climate change. This document should therefore be viewed in conjunction with the Design SPD.

[6] Woking Borough Council (2016). Woking Local Development Documents - Development Management Policies Development Plan Document. Available at: https://www.woking2027.info/developmentplan/management/dmpadp.pdf
[7] Woking Borough Council (2021). Review of the Development Management Policies Development Plan Document. Available at: https://www.woking2027.info/developmentplan/management/dmpdpdreview.pdf
[8] Woking Borough Council (2016). Natural Woking: Biodiversity and Green Infrastructure Strategy. Available at: https://www.woking.gov.uk/sites/default/files/documents/Nature/nwstrategy.pdf

3. Sustainability Through Standards

3.1 Building Regulations

3.1.1 In June 2022, significant changes in the Building Regulations[9] came into effect for new homes, extensions, existing buildings and non-domestic buildings. New homes and buildings in England will have to produce significantly less carbon dioxide (CO_2) under new rules. Under the new Regulations, CO_2 emissions from new build homes must be 31% lower than current standards and emissions from other new buildings, including offices and shops, must be reduced by 27%. Amendments include:

- Part F (ventilation)[10] and Part O (overheating)[11] – uplift to ventilation and solar gain reduction requirements to avoid the issue of overheating (see **Section 7.2**);
- Part L (conservation of fuel and power)[12] – setting standards for the energy performance of new and existing buildings (see **Section 4**); and
- Part S (infrastructure for charging electric vehicles)[13] – specification for the installation of electric vehicle (EV) charging points or cable routes (see **Section 6.2**).

3.1.2 These updates mark a steppingstone towards the introduction of the Future Homes Standard[14] and Future Buildings Standard[15] in 2025, which will introduce more stringent changes to Parts L and F.

3.2 BREEAM

3.2.1 Among voluntary measurement ratings for green buildings, the Building Research Establishment (BRE) Environmental Assessment Method (BREEAM) has become one of the most comprehensive and widely recognised measures of a building's environmental performance. BREEAM UK New Construction Version 6[16] describes an environmental performance standard against which new, non-domestic buildings can be assessed.

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[9] The Building Regulations 2010 No. 2214. Available at: https://www.legislation.gov.uk/uksi/2010/2214
[10] Ministry of Housing, Communities & Local Government (2022). Ventilation: Approved Document F. Available at: https://www.gov.uk/government/publications/ventilation-approved-document-f
[11] Ministry of Housing, Communities & Local Government (2022). Overheating: Approved Document O. Available at: https://www.gov.uk/government/publications/overheating-approved-document-o
[12] Ministry of Housing, Communities & Local Government (2022). Conservation of fuel and power: Approved Document L. Available at: https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l
[13] Ministry of Housing, Communities & Local Government (2022). Infrastructure for charging electric vehicles: Approved Document S. Available at: https://www.gov.uk/government/publications/infrastructure-for-charging-electric-vehicles-approved-document-s
[14] Ministry of Housing, Communities & Local Government (2021). Consultation outcome: The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings. Available at: https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings
[15] Ministry of Housing, Communities & Local Government (2021). Consultation outcome: The Future Buildings Standard. Available at: https://www.gov.uk/government/consultations/the-future-buildings-standard
[16] BRE (2022). BREEAM UK New Construction Version 6. Available at: https://files.bregroup.com/breeam/technicalmanuals/sd/uk-new-construction-version-6/?utm_campaign=2361144_BREEAM%20NEW%20USA%20New%20construction%20manual%20downloads&utm_medium=email&utm_source=BRE&dm_t=0,0,0,0,0&dm_i=47CQ,1C1KY,7TVZLP,667EQ,1#_frontmatter/schemedoc.htm?TocPath=_____7

3.2.2 The Council has adopted BREEAM standards in Policy CS22 to deliver more sustainable non-residential development across the Borough. New non-residential development of 1,000 m^2 or more (gross) floorspace is required to comply with BREEAM 'Very Good' standards (or any future national equivalent). For a full description of the building types that this policy refers to see the latest BREEAM guidance.

3.2.3 In order to achieve a BREEAM 'Very Good' rating, a building must achieve the minimum standards of performance in the key areas described in **Table 3.1** (to guarantee performance against fundamental environmental issues), in addition to the minimum score of 55%. This is the minimum requirements of Policy CS22; developers are encouraged to exceed these standards where possible.

Table 3.1 Minimum Requirements for BREEAM 'Very Good'

BREEAM Issue	Minimum Standard	Further Guidance	Manual Section[16]
Man 04 Commissioning and handover	One credit (commissioning-test schedule and responsibilities)	A schedule of commissioning and testing must be produced, in accordance with appropriate standards such as current Building Regulations, Chartered Institution of Building Services Engineers (CIBSE) guidelines, amongst others.	59
	Criterion 11 (Building User Guide)	Prior to handover, develop two building user guides for non-technical users for occupiers and for the facilities managers.	61
Ene 02 Energy monitoring	One credit (First sub-metering credit)	Sub-metering to be installed so that at least 90% of the estimated annual energy consumption of each fuel is assigned to its end-use category. The energy consumption will be monitored by end-use category if the total useful floor area is > 1,000 m^2. Below this area, an energy monitoring and management system could be used, or separate accessible sub-meters. (see **Section 4**).	148
Wat 01 Water consumption	One credit	Utilising the BREEAM Wat 01 calculator or alternative method to compare the water consumption (litres/person/day) for the building against a baseline. At least a 12.5% improvement must be demonstrated. The yield of any greywater and rainwater systems can be offset from the demand (see **Section 7.2**).	208
Wat 02 Water monitoring	Criterion 1 only	A water meter must be installed on the mains water supply to the building, including via a borehole or private source (see **Section 7.2**).	219
Mat 03 Responsible sourcing of construction products	Criterion 1 only	100% of timber and timber-based products used on the project will be 'legal' and 'sustainable' in accordance with the UK Government's Timber Procurement Policy[17] (see **Section 5**).	249

[17] Defra (2013). UK Government Timber Procurement Policy (Fifth Edition) (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/320982/2013_05_08_-_CPET_Deft_Legal___Sustainable_5th_ed_-_Final.pdf

3.3 Complying with the Standards

3.3.1 To ensure compliance with the standards set out in this SPD, the Council advises that clear evidence (i.e. Energy Statement or Sustainability Statement) is provided with a planning application to demonstrate compliance with CS22 and CS23. The general principles for demonstrating compliance are set out here.

- **Early commitment:** The Council recommends the developers' early commitment to the standards set out in Policy CS22 and the additional guidance in this SPD. This avoids costly design amendments and delays in achieving planning permission.
- **Environmental rating evidence:** The Council recommends that applicants submit documentation from qualified assessors to confirm that the development will comply with the environmental rating requirements of Policy CS22. It is strongly recommended that a pre-assessment is carried out early in the design process and before a planning application is submitted. If this is not the case, then the evidence will be required via a planning condition prior to the commencement of the development, should the planning application be approved. If applicants are unsure, it is advised they speak to the Council.
- **Carbon reduction evidence:** A clear rationale setting out how fabric performance and overall CO_2 targets have been achieved is helpful, and, should demonstrate the feasibility of connecting to any local energy networks for heating, cooling and/or power. This can be evidenced within an Energy Statement or summary of performance metrics determined using approved national methodologies.
- **Climate Neutral Development Checklist (See Appendix C) :** It is advised that all applications for new development should include a completed copy of the Council's Climate Neutral Development Checklist (with the exception of very minor developments such as minor exterior alterations).
- **Cooperation:** The Council encourages co-operation between developers on larger sites where two or more separate development schemes are proposed. Opportunities for connection to a decentralised, renewable or low-carbon energy supply, where available, is encouraged as are opportunities for working together to benefit from the economies of scale related to the amount of development.

Technical and Financial Viability

3.3.2 The Council recognises that viability is increasingly becoming a critical issue in determining applications for new development and the incorporation of low carbon / renewable requirements. Policy CS22 allows scope for a case to be made if a developer considers the requirements unattainable on technical or financial viability grounds.

3.3.3 Where the applicant / developer states that they cannot achieve the requirements due to financial reasons, the Council will require evidence to back up this position. Financial viability arguments will only be accepted if:

- Achievement of the policy requirements would make the proposal unviable – where the applicant has identified a potential shortfall, they will need to submit a sound and fully justifiable case alongside an open-book viability analysis for why the policy requirement cannot be met;
- A variety of sustainable energy sources and generation methods have been assessed and costed; and

- The development proposal would contribute to achievement of the objectives, strategy and policies of the Core Strategy.

3.3.4 The Council will expect clear evidence and justification to be presented on why a development cannot achieve either part, or the whole of the standards set out in Policy CS22. This should include a detailed technical and financial appraisal; open to clear inspection, demonstrating why required standards would render the development unviable or that standards cannot be achieved for technical reasons. This should include the details of any rejected options and take full account of any subsidies and grants likely to be available at the time of construction and ongoing operation.

3.3.5 Any financial viability appraisal will need to take account of all other planning obligations for the development, such as affordable housing, and therefore should take place at outline or full application stage, or at reserved matters stage in some circumstances. The appraisal is not appropriate at discharge of condition stage in most cases.

3.3.6 If requested, the Council will treat any information provided by the applicant as commercially confidential and will enter into appropriate confidentiality agreements with developers. Should there be an issue with providing commercially sensitive information, an independent assessor may be appointed to undertake the analysis of the scheme viability and the ability of it to achieve the planning objectives and / or planning obligations deriving from the policy. However, this will be at the cost of the applicant.

3.3.7 The onus is on the developer to demonstrate why meeting the standards set down in the policy is not viable based on reasonable market assumptions.

4. Carbon and Sustainable Energy

4.1.1 The Council aims to address the causes and potential impacts of climate change at a local level by increasing energy efficiency and reducing carbon emissions within new development / refurbishment, as well as promoting the development and take-up of renewable energy within the Borough.

4.1.2 The Building Regulations Approved Document[12] provides the full technical guidance regarding standards for the energy performance of new and existing buildings in Part L, including special provisions for those connecting to existing or new heat networks. 'Primary energy' will be used in combination with CO_2 metrics to assess compliance with Part L. Primary energy calculations take into account factors such as the efficiency of the building's heating system; power station efficiency for electricity; and energy used to produce fuel and deliver it to the building.

4.1.3 New and redeveloped buildings should be built to high environmental standards and are encouraged to exceed minimum local planning policy and Building Regulations requirements. Whilst the 2016 Zero Carbon Homes target has been replaced with the Future Homes Standard[15], new residential development is encouraged to pursue net zero standards where feasible. Larger scale non-residential or mixed-use proposals will be required to conduct a BREEAM[16] assessment and achieve at least a Very Good rating in accordance with Policy CS22, but higher standards are achievable. A new-build exemplar is the Living Planet Centre[18], which achieved BREEAM 'Outstanding', and the refurbishment of Victoria Gate[19], which achieved BREEAM 'Excellent'.

4.1.4 Planning applications will need to show how the proposed development will meet the low carbon energy requirements set out in policies CS22 and CS23.

Standard for Residential Development

4.1.5 Policy CS22 sets out how from 1 April 2016 new residential development on both previously developed land and greenfield sites is required to meet the energy and carbon dioxide and water components of Code for Sustainable Homes (CSH) Level 5 "or any future national requirement". At the time the policy was adopted, CSH Level 5 energy efficiency standard was defined by government to be a 'zero carbon development', and addressed only 'regulated' energy – that from heating, fixed lighting, hot water and building services.

4.1.6 This was considered to be an achievable standard that was intended to be a national requirement via Building Regulations by 2016. However, in recognition of the latest policy context, the Council will interpret "any future national requirement" to refer to the emerging Future Homes and Building Standards, which have succeeded the Government's 2016 zero carbon homes policy intentions.

4.1.7 The Council therefore requires new residential development to comply with Part L of Schedule 1 to the Building Regulations and the energy efficiency requirements for dwellings as follows:

[18] WWF (2022). The Living Planet Centre. Available at: https://assets.wwf.org.uk/custom/stories/lpc/
[19] Scott Brownrigg (2022). Victoria Gate. Available at: https://www.scottbrownrigg.com/work/projects/victoria-gate/

All new residential development will be required to achieve as a minimum the interim requirements set out in the Building Regulations etc (Amendment) (England) Regulations 2021 (or any future national requirement). This currently requires around a 31% reduction on the Dwelling Emission Rate (DER) against the Target Emission Rate (TER) based on the 2013 Edition of the 2010 Building Regulations (Part L). A fabric first approach shall continue to be prioritised.

All new residential development will be required to meet the Future Homes Standard when it comes into effect in 2025.

Standards for Non-residential Development

4.1.8 The Council expects new non-residential development to comply with the new 2021 uplift in energy performance standards implemented through changes to the Building Regulations and publication of new statutory guidance, and subsequently with the new Future Buildings Standard once it is introduced. The interim standard is intended to deliver an average 27% improvement in CO2 emissions per building, relative to 2013 Part L standards, across the build-mix of non-domestic buildings. This would typically be delivered by very high fabric standards, resulting in lower levels of heat loss from windows, walls, floors and roofs, improved services such as lighting, and low carbon technologies such as heat pumps or photovoltaic panels.

4.1.9 These minimum energy performance standards implemented through amended Building Regulations will naturally lead to improved performance under the Energy category of the BREEAM assessment. Developers are encouraged to go beyond both the Building Regulations and BREEAM minimum standards if they wish and continue pushing the boundaries of innovation.

4.2 Energy Efficiency

Box 4.1 Aims – Energy Efficiency

What to aim for:

- Apply the energy hierarchy to any new development, adopting a ‘fabric first’ approach;
- Comply with the Building Regulations Fabric Energy Efficiency Standard; and
- In the case of non-domestic developments with high energy consumption - include three credits from BREEAM Ene04 to achieve a 10% reduction in carbon emissions.

4.2.1 Proposals that follow best practice and consider the energy hierarchy are endorsed by the Council. The best and easiest way to reduce carbon emissions in any new development is to reduce the energy requirements once in use to a minimum. Once appropriate design features are integrated then low carbon energy generation options can be considered for adoption. The energy hierarchy in **Table 4.1** will help guide decisions about which energy measures are appropriate in particular circumstances.

Table 4.1 Energy Hierarchy

Stage	Description	Sustainability
Reduce the need for energy (LEAN)	The site layout and orientation of buildings can reduce the energy demand of buildings by capitalising on passive solar gain for heat and light (see **Section 5**).	**Best**  **Worst**
Use energy efficiently (LEAN)	There are a range of measures that can be incorporated which help save and efficiently use energy, including thermal efficient glazed windows, draught proofing, insulation, and energy efficient appliances (e.g. light fittings) (see **below**).	
Supply energy efficiently (CLEAN)	Greenhouse gas (GHG) emissions can be significantly reduced by using existing energy supplies more efficiently e.g. by distributing waste heat energy via power networks or using decentralised energy networks (DEN) (see **Section 4.5**).	
Use renewable energy (GREEN)	Incorporate technologies that obtain energy from natural sources such as the wind, water and sun (renewable energy sources) (see **Section 4.3**).	

4.2.2 If our homes and businesses do not need as much power and heat to operate, this, in turn, will have a positive impact for the occupier through reduced energy bills. For example, utilising local energy networks reduces transmission losses, improves access to local low-carbon and sustainable energy supplies / storage and allows for better community utilisation of local assets.

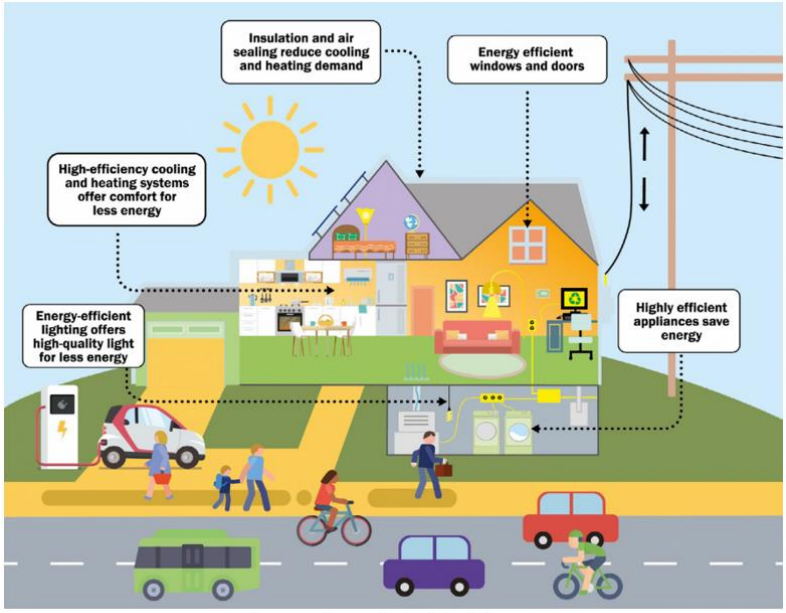
4.2.3 The 'fabric first' approach prioritises improvement of thermal properties of the building fabric via high levels of thermal insulation and air tightness. This follows the hierarchy above, where increased performance of the fabric of the building can improve the efficient use of energy, then followed by increases of various energy systems (e.g. heating and hot water). If done in a retrofit context, then re-sizing of systems may be necessary, but this should come after the fabric stage (particularly prior to heat pump installation). Other examples of design could also include passive shading design, natural daylighting (see **Section 5.1**), natural ventilation and appropriate sizing of building systems. An example case study of retrofit to improve energy efficiency is shown in **Box 4.1.**

4.2.4 In terms of best practice, the London Energy Transformation Initiative (LETI) provides guidance for developers on how to design and build zero carbon buildings. See Climate Emergency Design Guide | LETI for more information.

Box 4.1 Case Study – Former Military Properties, Brookwood, Woking[20]

ThamesWey's energy efficiency "make-over" of 50 former military properties was completed towards the end of 2018. Solid wall insulation, insulated roof tiles and solar panels were installed to help make these properties more comfortable and lower the fuel bills for tenants. ThamesWey's aspiration was to eliminate defective building fabric with the outcome of providing homes that are warm, damp free, economical to run for the residents and low maintenance. A result of the works is an enhanced environmental performance, demonstrated by an improved Energy Performance Certificate (EPC) rating of a C from a former E rating. The resulting potential fuel saving per year for each resident is over £500. The transformational impact is homes that are now modern looking, high-energy efficient, warm and more cost effective to run.

Figure 4.1 Residential Energy Efficiency



Source: Department for Economy

4.2.5 Where a residential extension requires planning permission, and for small new non-residential development which is not covered by BREEAM requirements[16], the Council will require simple, cost effective energy efficiency and water efficiency measures to be carried out if possible and practical (see **Section 7.2** for water efficiency). Investing in these measures will assist in gaining planning permission and can increase the value of the building. Examples of energy efficiency measures are given in **Figure 4.1.**

[20] ThamesWey (2019). ThamesWey Housing completes energy efficiency programme. Available at: https://www.thamesweygroup.co.uk/energy-efficiency-project-complete/

4.3 Renewable or Low Carbon Energy

Box 4.3 Aims – Renewable or Low Carbon Energy

What to aim for:

- Apply the energy hierarchy to any new development, adopting a 'fabric first' approach;
- Consider design issues associated with installing LZC technologies and describe your preferred approach in the Design and Access Statement; and
- LZC technology additions should cause minimum intervention to any heritage assets.

4.3.1 The Council has not set a specific target for developers to secure a proportion of energy demand through the installation of renewable and low and zero carbon (LZC) technologies as this is incorporated in the Building Regulations[9] (as amended) and the BREEAM methodology[16].

4.3.2 This section aims to guide developers as to the range of renewable and LZC technologies available and guides applicants for developments with exceptionally high total energy consumption how to reduce the total carbon emissions through the use of sustainable energy measures on site.

4.3.3 Once a development has been designed to a high level of energy efficiency to achieve greater levels of carbon emission savings, then sources of decentralised energy and renewable power should be considered. These can be undertaken on-site or in the immediate locality of the development.

4.3.4 Renewables and LZCs can be broadly split into three categories as shown in **Table** 4.2.

Table 4.2 Renewable and LZC Technologies

Electricity Producing	Heat Producing	Combined Heat and Power
• Photovoltaic (PV) solar panels • Wind turbines • Hydro-electric turbines	• Solar hot-water collectors • Ground source heat pumps • Water source heat pumps • Air source heat pumps • Biomass fuelled boilers • Biomass fuelled stoves • Anaerobic digesters	• Combined heat and power (CHP) plants

4.3.5 Developers considering installing any renewable or LZC technologies are advised to take professional advice at the earliest possible stage. This can identify whether or not your site is suitable, and which technology would be most appropriate.

Planning Permission for Micro-Generation Technologies

4.3.6 The General Permitted Development Order (GPDO)[21] grants the right to carry out certain limited forms of development without the need to apply for planning permission. Planning considerations for micro-generation technologies should be in accordance with the GDPO, but please be aware that there are some exceptions and clarity should be sought from the Council.

4.3.7 The Council encourages the integration of DENs in developments (as per **Section 4.5**). However, this will depend on the suitability, scale and location of the proposal and a range of technologies should be explored. In evaluating particular energy technologies, developers should be aware of causing any other planning problems such as adverse impacts on design or character, unnecessary loss of heritage significance, noise pollution, odour or air pollution, or impacts on protected trees or important buried archaeology.

Developments with High Energy Consumption

4.3.8 Policy CS22 in the Core Strategy sets out requirements for developments with high total energy consumption as summarised in **Box 4.4**.

Box 4.4 Core Strategy – Renewable and Low Carbon Energy Policies

CS22: Sustainable construction

Applications for developments with exceptionally high total energy consumption, such as large leisure facilities with a high heat demand or buildings with exceptionally high power / cooling loads (such as data centres), will be required to reduce the total carbon emissions from the development by 10% through the use of renewable energy measures on site.

4.3.9 It is anticipated that BREEAM UK New Construction[16] standards will be used to assess the types of buildings to which this policy applies (including those of less than 1,000 m^2 gross floorspace if energy consumption is exceptionally high). Within the scheme, Ene04 'Low carbon design' aims to first reduce carbon emissions with a fabric first approach and then encouraging local energy generation from renewable sources to supply a significant proportion of the energy demand.

4.3.10 In order to comply with the policy criteria set out above, it will be required that, in addition to (or as a means to) achieving a 'Very Good' rating, the proposed development achieves all three credits available in Ene04 by:

- Passive design analysis that includes thermal modelling and associated assessment of free cooling options for the proposed development; and
- Conducting a feasibility study at concept design (or equivalent procurement stage) carried out by an energy specialist to establish the most appropriate local (on-site or near-site) LZC energy source for the building / development.

[21] The Town and Country Planning (General Permitted Development) (England) Order 2015. Available at: https://www.legislation.gov.uk/uksi/2015/596/contents/made

4.3.11 Full details, including a methodology for calculating energy savings, are provided in the Technical Manual[16] for the BREEAM scheme.

4.3.12 The Council expects all new development in proximity to the Borough's existing/proposed DEN to connect, therefore this connection should be included in calculating a 10% reduction in carbon emissions, utilising the specific approach for heat network connections as set out in the Part L Approved Documents. Due to the significant technical and cost implications of developments of this nature, applications should include a feasibility study and preassessment report confirming that these requirements will be achieved.

Design Considerations

4.3.13 There are a number of design issues that should be taken into consideration when installing LZC technologies. For individual buildings where small-scale LZC technologies are used, design issues include:

- The siting of the technology;
- Efficiency (e.g. pitch of solar PV panel or viable wind speed);
- Requirement for battery storage;
- Safety;
- Any noise associated with it;
- Colour and appearance of the technology; and
- Ecological and landscape impacts.

4.3.14 Opportunities should be taken for small-scale technologies (including nature-based solutions) to incorporate beneficial features for species such as bats and birds, to improve biodiversity (see **Section 7.2**).

4.3.15 For multiple buildings where DENs (see **Section 4.5**) are used, design issues can include:

- Access (for fuel provision e.g. biomass);
- Visual intrusion;
- Location of plant;
- Noise from traffic and plant operations;
- Health and local ecology;
- The best 'technology mix' to balance the demand for energy;
- Installation, connection and transmission costs;
- Adjoining developments and heat networks; and
- Potential ecological and landscape impacts.

4.3.16 Any design issues arising from the installation of LZC technologies for a development should be covered in the Design and Access Statement, where a statement is required to support a planning application.

4.4 Stand-alone Sustainable Energy Generation

Box 4.5 Aims – Stand-alone Sustainable Energy Generation

What to aim for:

- Optimise key opportunities for renewable energy development in the Borough;
- Pay particular attention to Thames Basin Heaths SPA; and
- Identify sustainable energy opportunities in NDPs.

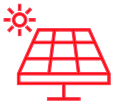
4.4.1 The Council supports renewable and low carbon energy generation both as part of residential and commercial development, and as stand-alone development, provided they do not have an unacceptable effect on the local environment that would out-weigh their wider community and/or environmental benefits. This is reflected in Policy CS23 of the Core Strategy.

4.4.2 A 'Climate Change and Decentralised, Renewable and Low Carbon Energy Evidence Base'[22] study was commissioned in 2010 to determine the Borough's key opportunities and constraints for sustainable technologies development. Development proposals may come forward for all types of schemes, but some technologies are considered to have more potential for development in the Borough than others. The study concluded that a number of physical and environmental constraints limit the opportunities for large-scale renewable energy generation in the Borough. Opportunities and constraints for each technology are summarised in **Table 4.3**. For any medium or large-scale developments, it is likely that an Environmental Impact Assessment (EIA) would be required.

Table 4.3 Renewable Energy Generation – Opportunities and Constraints

Technology	Overview	Suitability in Woking
Medium and large-scale wind energy 	Wind turbines harness the power of the wind. When the wind blows the blades are forced round, driving a turbine which generates electricity. Wind speed is critical to the performance of wind turbines. Wind speed is influenced by geographical location, elevation of site, local terrain, proximity of buildings, trees or other structures and the height of the turbine above ground level.	Very few unconstrained sites in the Borough for large-scale generation of energy from wind. Any building scale deployment would require detailed studies to assess potential adverse impacts such as noise nuisance, wildlife and ecology, flood risk, shadow flicker and interference with telecommunications. It is not anticipated that roof-mounted turbine designs will be deployed.

[22] Woking Borough Council (2010). Climate Change and Decentralised, Renewable and Low Carbon Energy Evidence Base. Available at: https://www.woking2027.info/ldfresearch/ccdrlceeb.pdf

Technology	Overview	Suitability in Woking
Solar energy 	Solar water heating systems ('solar thermal') use heat from the sun to warm domestic hot water that is stored in a tank. Solar electricity systems capture the sun's energy using photovoltaic (PV) cells which convert the sunlight into electricity.	Good potential for exploiting solar energy in Woking for both residential and commercial development. No physical constraints other than the availability of a roof / structure that provides a good solar orientation and angle. Visual and other environmental impacts of large-scale solar farms will need to be considered.
Biomass energy 	Biomass technology uses organic materials, either directly from plants or indirectly from industrial, commercial, domestic or agricultural products to generate heat. Second generation fuels (using biomass as a by-product of other processes) may be more sustainable than fossil fuel alternatives.	Any use of biomass will need to demonstrate compliance with local air quality standards. The scale of fuel storage required on-site (and suitable access for delivery vehicles) is another important consideration.
Landfill gas and energy from waste 	Landfill gas, produced when waste materials break down, can be collected and used to produce electricity, heating and / or cooling. The term 'energy from waste' can describe a number of treatment processes and technologies used to generate a usable form of energy and which also reduce the solid volume of residual waste.	The Surrey Waste Local Plan (SWLP) 2019-2033[23] provides a policy framework that is supportive of the development of waste facilities that can be used to generate biogas along with other reclaimed materials. It is recommended that prospective developers refer to the Surrey Waste Plan for details.
Sewage gas 	Sewage gas ('biogas') is generated as a by-product from the anaerobic digestion of sewage sludge or other organic wastes (e.g., grass cuttings, food waste) and is a mixture of methane, carbon dioxide, nitrogen, hydrogen and hydrogen sulphide gases. If compressed and purified, biomethane can be used to power a generator or CHP plants.	It is unlikely that locally produced biogas from sewage treatment plants will make a contribution to the sustainable energy mix in Woking.
Hydroelectricity 	Hydroelectricity systems generate electricity from running water - usually a small stream – to turn a small turbine which generates electricity. The faster the water flows and the more water there is the more electricity can be generated. Hydro systems can be connected to the grid.	Woking has a number of small rivers flowing through the Borough and along its boundaries. In the majority of cases the flow within the local streams and rivers is relatively small, and there is very limited potential for installation of low head hydro generation of power. Suitability very much depends on the nature of the development.

[23] Surrey County Council (2020). Surrey Waste Local Plan. Available at: https://www.surreycc.gov.uk/__data/assets/pdf_file/0003/246882/2020-11-20-SWLP-Part-1-for-Adoption-Final.pdf

Technology	Overview	Suitability in Woking
Waste heat recovery 	Some industrial activities produce large amounts of waste heat that are dumped through the use of cooling towers or heat dumping into rivers, lagoons or the sea.	There are currently no power stations or industrial installations in Woking producing large volumes of waste heat that are available for re-use. However, there may be the potential to capture the heat discharged from some other types of buildings with very high cooling loads (such as data centres) and re-using it in buildings nearby.
CHP and district heating 	CHP is the use of a turbine or fuel cell to simultaneously generate both electricity and useful heat. The heat is recovered and distributed via insulated pipes to provide hot water and comfort heating in buildings. CHP can be fuelled by a number of fossil fuels including natural gas and oil, or low-carbon and renewable fuels such as biomass, biogas or 'green' hydrogen, with or without carbon capture and storage. Being locally produced and distributed, there are reduced losses associated with the electricity produced and it can help to reduce the need for less efficient and more carbon intensive generation on the national energy grid.	There is great potential for extending the existing network in Woking Borough. Developments in identified 'district heat zones' are expected to connect to heat networks or be designed to ensure compatibility with the network. Further details on this are provided in **Section 4.5**.

Planning Constraints

4.4.3 There are numerous planning constraints that will affect the suitability of the various renewable / low carbon energy technologies. More than one constraint on a site is possible. The Renewable and Low Carbon Energy PPG[78] sets out a range of planning considerations that the Council will consider that relate to renewables and low carbon energy. This is a useful reference point for prospective developers and will be referred to when making planning decisions. It also emphasises that local planning authorities can use planning conditions or planning obligations to help mitigate the impacts described.

4.4.4 Particular attention should be given to potential adverse effects of energy developments on the Thames Basin Heaths Special Protection Areas (SPA). Within the parts of the Borough covered by Green Belt designation, extensive areas of heathland are present. These include Horsell Common, Sheets Heath and Brookwood Heath, which are considered to be of European significance and are designated as part of the Thames Basin Heaths SPA. Any proposals for energy development with potential significant impacts on the SPA will be subject to a Habitats Regulations Assessment.

4.4.5 A variety of studies exist which can be referenced by those conducting energy feasibility studies ahead of submitting development proposals:

- Climate Change and Decentralised, Renewable and Low Carbon Energy Evidence Base (2010);[21]

- Woking Design SPD (2015);[24]
- Thames Basin Heaths Special Protection Area Avoidance Strategy (2022);[25] and

Community-led Initiatives

4.4.6 Policy CS23 encourages applications from community-based and community-owned renewable and low carbon energy generation projects. Working as a community to generate renewable energy has advantages to doing it individually. Many energy technologies work better at a larger scale; and they can provide valuable incomes for communities. Both planning and land ownership issues need to be considered in the earliest stages of a community energy project. It is advised that all communities hold pre-application discussions with the Council in advance of putting in any planning application and to fully engage with the wider community before approaching the Council.

4.4.7 A community's energy feasibility study should include consideration of planning issues and what impact they could have on the choice of technology. Some key issues to consider are:

- Neighbours: how close will the installation be to houses and what effect might it have on them? (see Policy CS21 of the Core Strategy);
- Amenity, visual impact and landscape: how conspicuous is the installation and have regard to landscape character areas (see Policy CS24 of the Core Strategy);
- Conservation areas and protected species: particular attention should be given to the impact on the Thames Basin Heath SPA, and whether an EIA will be required;
- Rights of way: presence of public paths on potential sites;
- Infrastructure: are transport networks adequate for the proposed installation – will any resources need to be transported? (see Policy CS18 of the Core Strategy)

4.4.8 The Localism Act 2011[26] reformed the planning system and handed new opportunities to communities to get involved in planning their local area. A voluntary neighbourhood planning process, including Neighbourhood Development Plans (NDPs), was introduced. The Act also provides for Neighbourhood Development Orders (NDOs). If a community energy scheme or development is in an agreed NDP, it is more likely that a planning application will be supported as the provisions of a NDP will be a significant material consideration in determining the application.

4.4.9 Community Energy guidance[27] is provided by the Department for Business, Energy and Industrial Strategy (BEIS) aimed at local groups interested in setting up a community energy project. The Council is very supportive of this and can play an active role in facilitating community projects.

[24] Woking Borough Council (2015). Woking Design SPD. Available at: https://www.woking2027.info/supplementary/designspd/httpwwwwoking2027infosupplementarydesignspdpdf.pdf
[25] Woking Borough Council (2022). Local Development Documents – Updated Thames Basin Heath Avoidance Strategy. Available at: https://www.woking2027.info/supplementary/tbhspaspd/strategy2022.pdf
[26] Localism Act 2011 c. 20. Available at: https://www.legislation.gov.uk/ukpga/2011/20/contents/enacted
[27] BEIS (2015). Guidance – Community Energy. Available at: https://www.gov.uk/guidance/community-energy

4.5 Low Carbon Heat and Decentralised Energy Networks

Box 4.6 Aims – Low Carbon Heat and Decentralised Energy Networks

What to aim for:

- All new buildings should utilise low carbon heat for heating and hot water;
- Connect to Woking Town Centre DEN if within proximity (see **Figure 4.2**)

4.5.1 Heat networks, often referred to as district heating schemes, deliver heat via hot or chilled water from a decentralised energy centre to buildings in a larger local area. This means that individual homes and businesses do not need to generate their own heat or cooling on site. Heat networks can be supplied with heat from a diverse range of sources including biomass, energy from waste, CHP plants or renewables. Further growth of the existing DEN will increase the benefits felt by the Borough and accelerate the transition to local, lower carbon energy generation.

4.5.2 There is a well-established low carbon DEN in Woking Town Centre, with high feasibility for new and redeveloped buildings to connect (see **Figure 4.2**) ThamesWey Ltd (energy services company for Woking) provide an interactive map[28] of the Woking Energy Network. New developments should look to secure an efficient supply of heat, cooling, and power, including through connection to the existing Town Centre DEN.

4.5.3 The map shown within **Figure 4.2** illustrates the extent of the existing and planned heat network, and **the Connection Zone** in Woking Town Centre, portrayed on the legend as the black dashed line titled **'potential reach of Decentralised Energy Network'**.

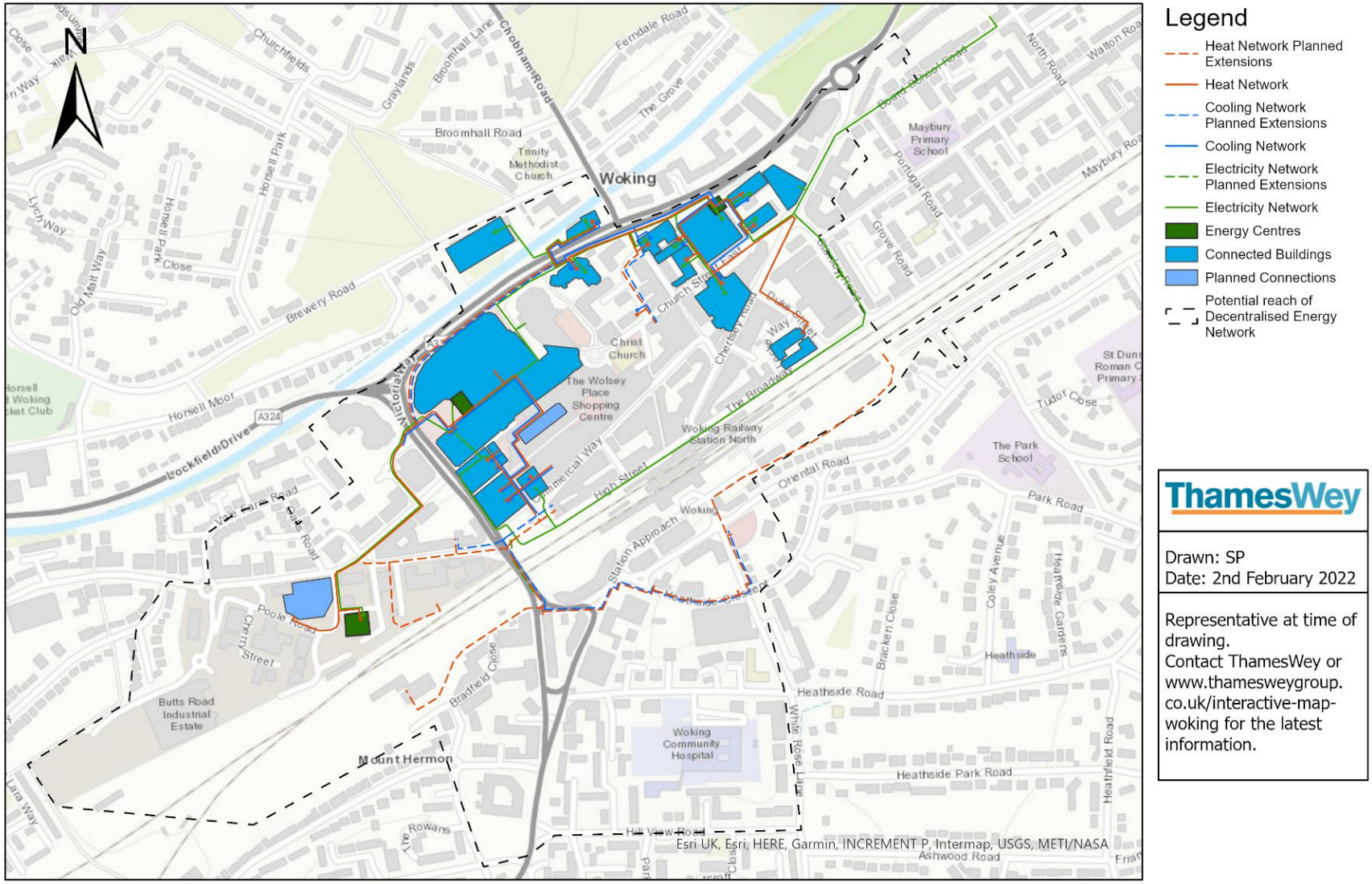
4.5.4 All new development within proximity (typically 500m or less) including refurbishments and conversions where planning permission is required, will be required to connect to the existing Town Centre DEN.

4.5.5 Development in the connection zone where the Town Centre DEN has not yet expanded to serve, should be designed to be 'connection-ready' and connect to the DEN when the network expands to the proximity of the site.

4.5.6 Development outside the Town Centre connection zone should consider establishing a new network if appropriate. Please note that beyond the town centre, an existing DEN exists at Pool in the Park & Leisure Centre (see **Figure 4.3**) and a planned DEN within the Sheerwater Regeneration Area (see **Figure 4.4**). The regeneration scheme includes a new energy centre and phased expansion of network supplies to new domestic, leisure and commercial customers. For updated details of these schemes please contact the Council.

[28] Interactive map available at: https://www.thamesweygroup.co.uk/interactive-map-woking/

Figure 4.2 Woking Energy Network[28]



Source: ThamesWey Ltd. Ordnance Survey data © Crown copyright and database right 2022

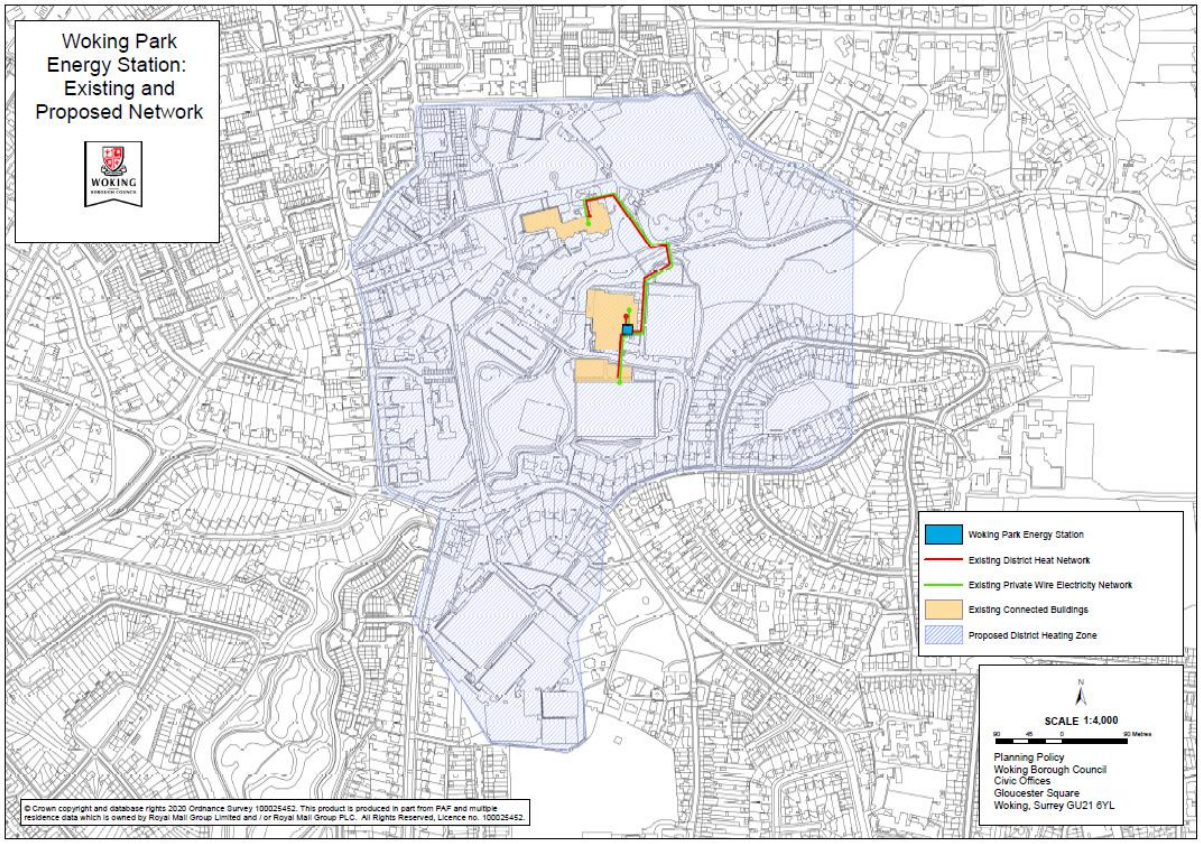


Figure 4.3 Woking Park Decentralised Energy Network and District Heat Zone as at Feb 2021

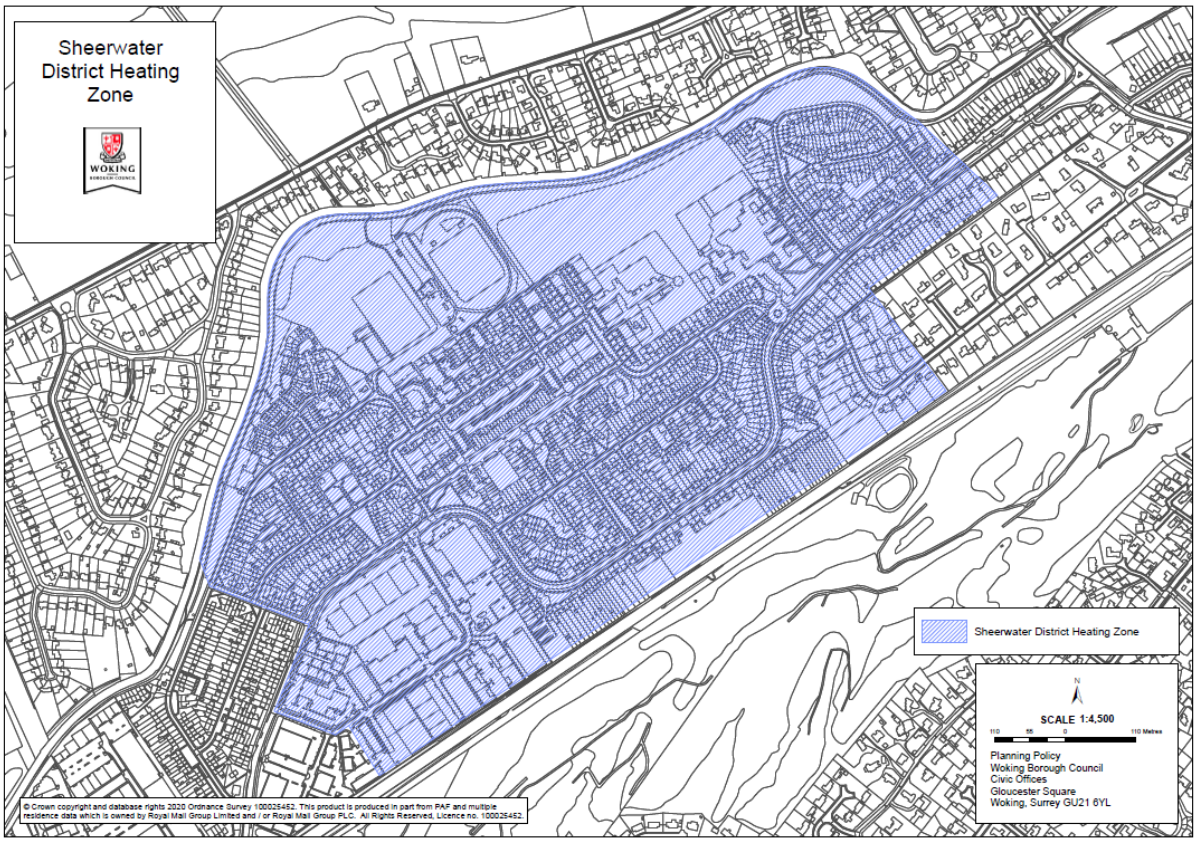


Figure 4.4 Sheerwater District Heat Zone as at Feb 2021

4.5.7 Woking's decentralised energy network 'Connection Zone' is a well established tool showing areas where energy demands should be met by the existing network. However, forthcoming 'Heat Network Zoning' legislation will give statutory powers to authorities to mandate that a new building connects to a heat network, whilst also requiring existing buildings to connect at key intervals such as renovation or heating system renewal. The authority will designate the zones this applies to, where heat networks are the lowest cost solution for decarbonising heat, similar to the existing 'Connection Zone', in future guidance. These powers will support delivery of CS22.

4.5.8 It is recommended that a feasibility study compliant to CIBSE CP1 standards is conducted at the earliest stage of the design process, investigating connection to the district heat and private wire networks. As part of this process, applicants should evidence correspondence with the local decentralised energy operator – ThamesWey Energy Ltd. Feasibility of new connections to these networks will be subject principally to proximity to existing network infrastructure, though major physical barriers between the existing network and potential connection point (e.g., the railway or the canal) may be relevant; so further case-by-case analysis will be pursued. In some cases, a contribution towards the connection costs will be sought from the building owner/occupier. This may be sought through negotiation of a legal agreement with the developer.

4.5.9 A case study on Skanska Hollywood House is included in **Box 4.7** that demonstrates the positive outcomes of applying these requirements to a dated building. Although considered a dated case study, it is important to recognise that all buildings irrespective of age should endeavour to meet these requirements as soon as possible (via retrofitting or refurbishment) in order to gain the benefits later as noted below.

Box 4.7 Case Study – Skanska Hollywood House, Woking Town Centre[29]

Skanska extensively refurbished Hollywood House between 2010 and 2011. Originally constructed in the 1980s, the building was energy inefficient and had high operational costs. The £3.5 m extensive refurbishment took 32 weeks to complete and involved the installation of new heating, lighting, ventilation, and energy management systems. A 20 kW solar PV array, 9.8 kW solar domestic water heating system and heat pump were installed to generate renewable energy on site. The building was also fitted with sophisticated energy monitoring and control systems and was connected to ThamesWey's Town Centre CHP system which provides low carbon electricity and district heating. Waste management and water efficiency were also addressed, with a rainwater harvesting system and water efficient fixtures installed as part of the refurbishment. The building now uses around 3 m^3 of water per person per year which is 55% less than what the Environment Agency considers to be good practice for an office building. The retrofit also considered healthy working environments with natural ventilation and a daylight dimming control system that regulates artificial lighting levels. Hollywood House now uses over 50% less energy than prior to the project and the total cost of the refurbishment is estimated to be repaid in approximately 13 years.

[29] ThamesWey (n.d.). Enabling Green Retrofit of Commercial Buildings. Available at: https://www.theade.co.uk/assets/docs/case-studies/Skanska.pdf

5. Design, Materials and Waste

5.1 Design and Layout

Box 5.1 Aims – Design and Layout

What to aim for:

- Optimising the potential for passive solar gain when designing site layouts;
- Design the layout to use landform and landscape to benefit from shelter;
- Use existing and proposed trees and shrubs to provide shade;
- Design buildings so that passive solar energy is captured and used;
- Design in measures to prevent excess solar gain in summer; and
- Maximising the potential for passive cooling and ventilation in summer.

5.1.1 The design and layout of new development can make a significant contribution in minimising GHG emissions and therefore its contribution to climate change. Reducing the energy demand of a building or group of buildings through passive design techniques (such as massing, daylighting or form) will generally offer a sound basis for implementing LZC technologies cost effectively. Policy CS22 of the Core Strategy requires this, which is supported by Policy CS21 on Design (and further details are available in the Design SPD) – see **Box 5.2.**

Box 5.2 Core Strategy – Design and Layout Policies

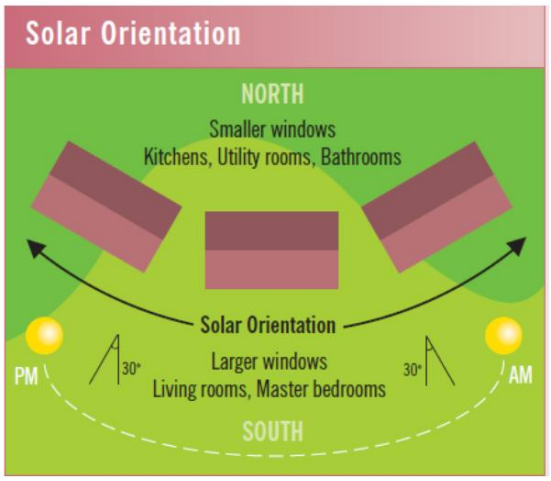
CS21: Design

Proposals for new development should incorporate measures to minimise energy consumption, conserve water resources, use the principles of sustainable construction and provide for renewable energy.

CS22: Sustainable construction

The design of all new developments will be required to take into account of layout, landform, orientation and landscaping to maximise efficient use of energy and adapt to the impacts of climate change.

Figure 5.1 Optimum Solar Orientation



5.1.2 Solar energy can minimise the energy demand of buildings by reducing space heating demand; contributing to daylighting inside and outside, supply heat for solar heated hot water, and generate electricity with PV panels. To maximise passive solar gain, buildings should be oriented with the longest façade being south facing (+/- 30°) (see **Figure 5.1).** Overshadowing of buildings should be avoided as it reduces the heat gain from the sun in winter. Getting the right glazing-to-wall ratio on each façade is a key feature of energy efficient design: minimise heat loss to the north (smaller windows), while providing sufficient solar heat gain from the south (larger windows). This means prioritising occupied spaces with larger windows on the south (such as living rooms and bedrooms in residential buildings, for example).

5.1.3 Good integrated design will also avoid summertime overheating and provide future adaptation for a rise in temperatures (see **Section 7.2**). This is recognised in the introduction of Part O to Building Regulations, specifically addressing the risk of overheating in buildings. It is important that developers avoid maladapted design, where energy efficiency measures (e.g. to increase solar gain and reduce winter heat loss) have the potential to exacerbate summer heat risks.

5.1.4 New developments should be designed to reduce cooling load as far as possible using passive solutions (e.g. through planting and shading) and then find the best mechanical solution to meet any remaining cooling requirement.

5.2 Waste

Box 5.3 Aims – Materials and Waste

What to aim for:

- Reduce the amount of resources used and the waste produced;
- Part H6 of the Building Regulations sets minimum requirements in relation to provision for solid waste storage;
- For non-residential development, achieve credits from the waste and materials elements of BREEAM to achieve 'Very Good' rating;
- Provide high-quality waste facilities; and
- Use recycled, re-used and / or local, sustainably sourced materials.

5.2.1 Tackling waste in the design of new buildings and places is crucial in reducing the effects of climate change because of the impact it has on the production of greenhouse gases (GHGs). Woking residents produced around 39,000 tonnes of

household waste in 2021/22.[30] Add to this the waste derived from commerce and industry, and the prerogative for its reduction and minimisation becomes clear, particularly as the population of Woking continues to grow. Policy CS22 facilitates the reduction of waste, and the reuse and recycling of buildings materials as shown in **Box 5.5.**

5.2.2 In 2020, Surrey County Council adopted the Surrey Waste Local Plan (SWLP) 2019-2033 which provides guidance on how and where different types of waste will be managed in Surrey. The SWLP also details a planning policy framework for the development of waste management facilities which ensures that the planning process can contribute towards national and local ambitions.

5.2.3 Woking Borough Council work within targets set by the Surrey Environment Partnership (SEP)[31] to reduce residual waste and increase recycling rates. SEP comprises of Surrey County Council (who act as the waste disposal authority) and the 11 Boroughs/District Councils within the County (who act as the waste collection authorities). SEP is responsible for domestic waste management and recycling across Surrey and aims to manage the County's waste in the most sustainable and economical manner possible. To enable SEP's targets to be met initiatives are developed and implemented via the Joint Waste Solutions (JWS) team. The Council advises that applicants refer to the 'Recycling and waste provision guidance for property developers' published by JWS[32] in 2022.

5.2.4 The publication of the national 'Resources and Waste Strategy' from central government in 2018 anticipates further changes to the delivery of recycling and waste services, and sets out how materials/ resources will be preserved by minimising waste, promotes resource efficiency and recognising the need to adopt principles of the circular economy. The strategy is subject to amendments from consultation, so in anticipation of further clarity from central government, the SEP 2025 plan[33] has been developed to provide interim guidance since the release of the Joint Municipal Waste Management Strategy in 2015 which is out-of-date.

Box 5.4 Core Strategy – Waste Policies

CS22: Sustainable construction

The design of all new developments should facilitate the reduction of waste and the recycling and composting of the waste produced. All developments should consider the use of sustainable construction techniques that promote the reuse and recycling of building materials. All development is encouraged to use responsible resourcing of materials and is encouraged to source materials locally.

[30] Surrey Environment Partnership (2021). What happened to Surrey's waste 2020-21. Available at: https://www.surreyep.org.uk/wp-content/uploads/2022/03/surreywaste2021-22_report_web-2.pdf
[31] Further information available at: https://www.surreyep.org.uk/about-us/our-strategy/
[32] Joint Waste Solutions (2022). Recycling and waste provision guidance for property developers. Available at: https://www.woking.gov.uk/planning-and-building-control/planning/planning-policies-and-guidance/waste-and-recycling
[33] SEP 2025 (2023). A partnership approach to waste prevention and recycling. Available at: https://www.surreyep.org.uk/about-us/sep-2025-strategy-document/

5.2.5 The Council is committed to curbing the growth in household waste, reducing the overall tonnages of waste collected and increasing the quantity of material sent for recycling and composting. Waste minimisation can be effectively addressed in the design and layout of new development, thereby contributing to this objective.

5.2.6 Sustainable waste management is guided by the 'waste hierarchy' as set out in UK law within the Waste (England and Wales) Regulations 2011[34], see **Table 5.1** for details of the waste hierarchy.

5.2.7 Preventing waste is the preferred option and sending waste to landfill should be the last resort. The design of neighbourhoods and supporting services should encourage and enable communities to follow the waste hierarchy.

Table 5.1 Waste Hierarchy[35]

Stage	Description	Sustainability
Prevention	Use less material in design and manufacture. Keeping products for longer; re-use. Using less hazardous material.	**Best** ↓ **Worst**
Preparing for re-use	Checking, cleaning, repairing, refurbishing, whole items or spare parts.	
Recycling	Turning waste into a new substance or product. Includes composting if it meets quality protocols.	
Other recovery	Includes anaerobic digestions, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling operations.	
Disposal	Landfill and incineration without energy recovery.	

Building Materials and Construction Waste

5.2.8 Development proposals should contribute towards reducing and recycling construction waste, and work towards 'designing out waste'. The best opportunities for improving materials resource efficiency occurs at the design stage of a development project. Implementing these opportunities can provide significant reductions in cost, waste and carbon. Circular economy principles should be applied in selecting materials, products and systems for a development, considering how these are sourced, and how they can be successfully reused, repaired, refurbished and recycled through their serviceable life.

5.2.9 Use of materials should be minimised as far as possible. The selection of materials should be informed by the scale of embodied carbon associated with their production (see example case study in **Box 5.5**). Examples of high embodied carbon materials include concrete, aluminium, and steel, which can be replaced

[34] The Waste (England and Wales) Regulations 2011 No. 988. Available at: https://www.legislation.gov.uk/uksi/2011/988/contents/made
[35] Department for the Environment, Food and Rural Affairs (2011). Guidance on applying the Waste Hierarchy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf

with lower carbon alternatives like timber, earth, straw, secondary aggregates and recycled products. BRE provide a free to use Green Guide[36] which examines the relative environmental impacts of construction materials.

5.2.10 Proposals should look to re-use materials from the development site and reclaimed and/or recycled materials for a range of uses. Re-use of building materials is more environmentally friendly than recycling. The demolition of buildings should be minimised as far as possible and materials derived from any demolition should be re-used, such as crushed concrete and hardcore aggregate in the new foundations. The retrofit of existing buildings is encouraged, this has multiple tangible environmental benefits alongside reducing carbon emissions – see **Box 4.7** for example case study.

5.2.11 The Council strongly recommends that materials should be specified from suppliers who participate in an applicable responsible sourcing scheme such as the BRE BES 6001:2008 Responsible Sourcing Standard. All timber should be sourced from schemes supported by the Central Point of Expertise for Timber Procurement, such as the Forest Stewardship Council accreditation, which ensures that the harvest of timber and non-timber products maintains the forest's ecology and its long-term viability.

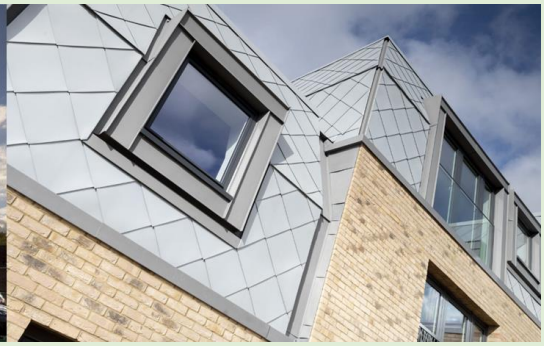
5.2.12 Whilst not a policy requirement at this stage, the Council encourages the submission of a Whole Life Carbon Assessment, including embodied carbon, for all applications proposing substantial demolition. Whole Life-Cycle Carbon emissions are the carbon emissions resulting from the construction and the use of a building over its entire life, including its demolition and disposal. They capture a building's operational carbon emission from both regulated[37] and unregulated[38] energy use, as well as its embodied carbon i.e., those associated with raw material extraction, manufacture and transport of building materials, construction and the emissions associated with maintenance, repair and replacement as well as dismantling, demolition and eventual material disposal.

5.2.13 Consideration should also be given as to whether the materials are resilient to expected changes in climate (see **Section 7.2**). Resilient building materials will minimise the need to replace materials, reducing embodied carbon and waste.

[36] Available at: https://tools.bregroup.com/greenguide/podpage.jsp?id=2126
[37] The carbon emissions arising from energy used by fixed building services, as defined in Approved Document Part L of the Building Regulations. These include fixed systems for lighting, heating, hot water, air conditioning and mechanical ventilation
[38] The carbon emissions relating to cooking and all electrical appliances and other small power.

Box 5.5 Case Study – Hale End Court, Woking[39]

The new specialist residential facility provides 48 independent living apartments along with combined communal, administrative and care facilities. Constructed from cross laminated timber (CLT), achieving a BREEAM 'Excellent' rating, the project is a highly sustainable response which contributes to the local housing need in and around Woking. All environmental briefing targets were exceeded dramatically, particularly minimising carbon where the selection of CLT sequestered some 845,510 $kgCO_2e$. The design delivered less than half the $kgCO_2e/m^2$ compared with a typical build and 35.9% improvement in energy performance compared with a typical build.



Recycling

5.2.14 The transport, treatment and disposal of waste are all energy demanding activities and contribute to harmful greenhouse gas (GHG) emissions. Developers are expected to ensure the design and layout of new developments supports sustainable waste management; and will be encouraged to take measures over and above the statutory requirements.

5.2.15 In the design phase the provision for the storage, collection and recycling of waste needs to be considered carefully. Developments can provide facilities for individual or groups of properties or premises for the source separation of and storage of different types of households and business waste for collection. To reduce the volume of refuse requiring collection, individual or community composting facilities should also be included in developments. It is encouraged that all proposals for development to include provision for individual compost bins within new dwellings. All waste facilities should be of high quality, should be visually attractive and should not detract from their immediate surroundings.

5.2.16 Larger scale developments provide an ideal opportunity to demonstrate how waste management facilities can be successfully integrated into the townscape. Innovative waste management systems are now available, such as piped underground refuse collection systems. These can have a significant effect on the design of a development and can encourage segregation and recycling. See **Box 5.6** for an example of the innovative waste management system at Wembley Park, which although not in Woking, sets an example of best practice which the Council would encourage applicants to consider taking inspiration from.

[39] SECBE (2022). SECBE Awards 2022 finalist - Hale End Court. Available at: https://www.secbe.org.uk/blog-post/599/SECBE-Awards-2022-finalist---Hale-End-Court

Box 5.6 Case Study – Wembley Park Waste Management[40]

Over 10 years after the installation of the Envac waste management system, Wembley Park residents are recycling five times more than the national average for apartments. The Envac system vacuums waste that has been emptied into inlets through a series of underground tunnels at speeds of up to 70 kph into a single collection station, reducing the need for unsightly on-street bins and significantly reducing the need for refuse lorry collections. Since opening, the system has collected around 3,000 tonnes of recycling. It has helped increase the local authority's recycling rates by 30%. Refuse lorry trips have been dramatically reduced, meaning emissions have gone down by 90%, saving an estimated 700 tonnes of carbon emissions each year from the local environment from completion. Waste that is unable to be recycled is more sustainably disposed of than traditional refuse. Excess waste from Wembley Park is taken to a waste-to-energy plant to be incinerated and converted into electricity, so nothing from the Envac system ends up in landfill.

Assessing Waste Management

5.2.17 Planning applications will be assessed against two frameworks to ensure that waste management needs are adequately addressed: via the requirements from both the Building Regulations[9] and BREEAM[16]. Part H6 of the Building Regulations sets minimum requirements in relation to provision for solid waste storage.

5.2.18 New non-residential development of 1,000 m2 or more (gross) floorspace is required to comply with BREEAM 'Very Good' standards. Although there are no minimum standards to be complied with for waste and materials elements to achieve a 'Very Good' rating, developers are encouraged to gain BREEAM credits for these issues in order to achieve this rating. By achieving maximum points for waste and materials elements developers can achieve a high BREEAM level.

Site Waste Management Plan

5.2.19 Applications for large scale development[41] should be accompanied by a Site Waste Management Plan (SWMP) that clearly sets out how waste produced during all stages of a development will be minimised and managed in a sustainable manner. A SWMP should both contain target rates for recycling and define processes to manage different waste streams. The impacts of the processes involved in the recycling or reuse of wastes on site will be considered when determining the

[40] Quintain (2020). Quintain celebrates results of over a decade of recycling with Envac at Wembley Park. Available at: https://www.quintain.co.uk/news-and-media/press-releases/2020/envac-wembleypark

[41] Under the Site Waste Management Plans Regulations 2008, all construction projects in England worth over £300,000 were required to have a SWMP in place before a project could begin. These Regulations were repealed, but the Council continues to strongly encourage such sites to undertake SWMPs.

acceptability of the proposed development. Designing out waste is a key element of good practice in the preparation of a SWMP. Some projects will require SWMPs in order to comply with BREEAM standards.

5.2.20 A number of tools have been developed to assist constructors, such as BRE's web-based tool SmartWaste[42] (which can be aligned to BREEAM). It can be used on all types of construction projects including new build and refurbishment, and suits both large and small construction projects, domestic or commercial.

[42] Further information available at: https://www.bresmartsite.com/products/smartwaste/

6. Sustainable Transport

Box 6.1 Aims – Sustainable Transport

What to aim for:

- Promote active travel for shorter journeys via travel packs and plans;
- Ensure that streets widths are sufficient to allow easy walking and cycling, where possible consider formal cycle paths and traffic calming measures;
- Incorporate EV charging facilities in garages and parking spaces as per relevant standards; and
- Provide secure, covered storage / parking for bikes and pushchairs in public areas.

6.1 Prioritising Walking, Cycling and Public Transport

6.1.1 A large percentage of carbon emissions come from transport habits of the occupants of new developments. Spatial planning shapes the pattern of future development, influencing the location, scale, density, design and mix of land uses. It can help reduce the need to travel and the length of journeys and make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking and cycling. Providing more appealing walking, cycling (with secure cycle parking and changing facilities where appropriate) and public transport options is the best way to reduce car use. Sustainable and active transport has multiple benefits beyond saving energy and carbon, such as improved local air quality, health and wellbeing benefits from being more active, greater potential for social interactions, the creation of green spaces, and reducing car-dependency.

6.1.2 The fourth Local Transport Plan (LTP4)[43] for Surrey sets out an ambitious roadmap for rethinking and transforming Surrey's transport to 2032 and beyond. The LTP4 aims to significantly reduce transport carbon emissions to meet the net zero challenge and to support delivery of Surrey's other priority objectives of enhancing Surrey's economy and communities, as well as the quality of life of residents. **Table 6.1** below summarises the core policy areas of LTP4.

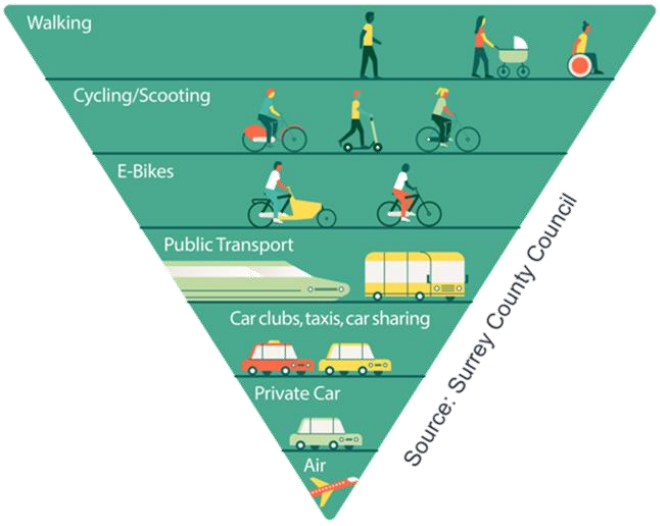
Table 6.1 6.1 Surrey LTP4 Policy Areas

Policy Area	Description
Planning for Place	Design and improve local neighbourhoods and other parts of towns and villages to provide attractive environments for people and increase opportunities to live and work locally.

[43] Surrey County Council (2022). Local Transport Plan (LTP4) – Available at: https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/transport-plan

Policy Area	Description
Digital Connectivity	Promote and encourage: access to high quality digital connectivity for all; and provision of online public and community services.
Active Travel / Personal Mobility	Provide facilities to encourage many more journeys to be made actively (on foot, by bicycle, scooting etc).
Public / Shared Transport	High-quality, reliable, affordable and joined up public, shared and demand responsive transport, supported by accessible and easy to use travel information and booking systems.
Demand Management for Cars	Measures to decrease use of cars for some journeys.
Demand Management for Goods Vehicles	Measures to decrease use of certain goods vehicles, and / or at certain times, or in certain locations.
Efficient Network Management	Managing the operation and maintenance of the highway network so that it runs smoothly, and the effects of traffic on communities and the environment are minimised.
Promoting Zero Emission Vehicles	Promoting rapid uptake of EVs (and hydrogen vehicles where appropriate).
Supporting Behaviour Change	Awareness campaigns and other activities to encourage walking, cycling and use of public transport and EVs.

Figure 6.1 Sustainable Transport Hierarchy



6.1.3 All development proposals should endeavour to support shifts in transport and travel behaviour as detailed within the sustainable transport hierarchy in **Figure 6.1**, which ranges from walking as the most sustainable transport mode, through to air travel as the least sustainable. Proposals should review the wider context of their site and provide strong links to existing footpaths (consider desire lines for walking), cycle routes (particularly in the Town Centre) and public transport nodes. Development proposals should also demonstrate flexibility to respond to future changing modal shifts. Developers should ensure the provision of car parking is consistent with cutting greenhouse gas (GHG) emissions, including through providing for electric vehicle (EV) charging infrastructure.

6.1.4 Secure and covered cycle parking should be located close to a property, with appropriate provision provided based on occupancy and in compliance with other supplementary guidance. E-bikes and E-cargo bikes should be considered, with a larger parking space and charging facilities required. Cycle lanes should also be designed to accommodate E-bikes and mobility scooters which require wider cycle lanes.

6.1.5 The Woking Town Local Cycling and Walking Infrastructure Plan (LCWIP)[44] identifies where Woking (in partnership with Surrey County Council) want to prioritise investment for walking and cycling over the next ten years and sets out some initial recommendations for improving walking and cycling in the town. The Woking Town LCWIP aims to create a wider walking and cycling network for the Borough and focusses on the strategic planning required to enable the development of local transport infrastructure.

6.1.6 Proposals should review the wider context of their site and provide strong links to existing footpaths, cycle routes and public transport nodes. The principles of Healthy Streets for Surrey design code[45] should be applied and considered wherever possible.

6.1.7 In accordance with Policy CS18 of the Core Strategy (see **Box 6.2**), certain developments will be required to conduct Transport Assessments and provide Travel Plans to minimise impacts and manage travel needs sustainably. Design and Access Statements should also address issues around walking, cycling, parking and public transport.

Box 6.2 Core Strategy – Sustainable Transport Policies

CS18: Transport and accessibility

Ensuring development proposals provide appropriate infrastructure measures to mitigate the adverse effects of development traffic and other environmental and safety impacts. Transport Assessments will be required for development proposals, where relevant, to fully assess the impacts of development and identify appropriate mitigation measures.

Requiring development proposals that generate significant traffic to be accompanied by a Travel Plan, clearly setting out how the travel needs of occupiers and visitors will be managed in a sustainable manner.

6.2 Electric Vehicle Charging Points

6.2.1 In 2020, the UK Government announced a ban on the sale of all new petrol and diesel cars and vans by 2030, with all new cars and vans to be fully zero emissions at the tailpipe by 2035. As part of the Council's commitment to achieving an energy efficient transport system and to cut carbon emissions, spatial planning will be used as a lever to boost the number of electric vehicle (EV) users in Woking. EVs also

[44] Surrey County Council (n.d.) Woking Town Local Cycling and Walking Infrastructure Plan (LCWIP). Available at: https://www.surreycc.gov.uk/roads-and-transport/cycling-and-walking/plans/woking-town-local-cycling-and-walking-infrastructure-plan-lcwip#section-1

[45] Surrey County Council (2023). Healthy Streets for Surrey design code – Creating streets which are safe and green, beautiful, and resilient. Available at: https://healthystreets.surreycc.gov.uk/

bring further advantages in terms of reducing noise pollution and improving air quality.

6.2.2 In order to achieve increased EV usage in the Borough, widespread charging infrastructure improvements will be necessary. Although the provision of public charging points will be important, many EV drivers will choose to charge their vehicles overnight at home. Recharging where people are employed will also be essential.

6.2.3 New development provides the best opportunity to accelerate the scale of provision for EVs and should include charging provision for EV use as standard. Policy CS22 of the Core Strategy states that new development in Woking Borough will be expected to contribute to charging infrastructure. This SPD sets out the minimum requirements for the provision of EV charge points in accordance with the current Building Regulations Part S as summarised in **Table 6.2.**

Table 6.2 Building Regulations – Part S[13] EV Charging Summary

Development	Threshold	Minimum Requirement	Section[13]
Residential	All new dwellings with parking	A minimum of either at least one EV charge point for each associated parking space or the number of dwellings that the car park serves.	S1. (2)
	>10 parking spaces or more parking spaces than dwellings	Cable routes must be installed in any parking spaces which do not have EV charge points.	S1. (3)
Non-residential	>10 parking spaces	A minimum of one EV charge point, with cable routes for one in five of the total parking spaces.	S4.

6.2.4 The Approved Document[13] provides the full technical guidance regarding the installation and charge point requirements in Part S to the Building Regulations. It applies to new residential and non-residential buildings; buildings undergoing a material change of use to dwellings; residential and non-residential buildings undergoing major renovation; and mixed-use buildings that are either new or undergoing major renovation.

6.2.5 The type of charging point will be decided on a case-by-case basis depending on the type and scale of development. All new EV charge points being installed will need to provide a minimum power supply of 7 kW or have the cable routes ready for this supply. It may be prudent to install cable routes that are capable of charging at a faster rate.

6.2.6 The design of parking facilities will affect the location and ease at which EV charging points can be installed. Charging points should be sited so that they are easy to access, in prominent locations that are well-signed for quick recognition by EV drivers. Consideration should be given regarding mobility and access for wheelchair users. It is recommended that charging infrastructure provided at development adopts ‘smart metering’ enabling users to be charged for the energy they use.

6.2.7 In order to reduce clutter in parking areas the installation of charge points with two outputs could be considered, i.e. one charge post with an outlet on either side to serve two active parking spaces. EV charging points can be provided at low cost

within dedicated off-street parking courts. Basement or under-croft parking provides particularly suitable environment for EV charging points. In these locations it is possible to provide secure charging points for vehicles where it would otherwise be impractical for private individuals to connect vehicles at home.

6.2.8 Management and maintenance of the charging infrastructure will be the responsibility of landowners and the chosen energy supplier. Those car parks privately managed should have appropriate enforcement procedures for the misuse of their parking stock.

7. Climate Change Resilience and Adaptation

7.1 Introduction

Box 7.1 Aims – Climate Change Resilience and Adaptation

What to aim for:

- Overheating assessment to design for future climate, employing principles of the natural cooling measures in order to future-proof the development;
- Designing development to be resilient to flood risk including allowances for climate change;
- Use of SuDS in development to integrate GBI and design for allowances for climate change;
- Integrate GBI into development, utilising nature-based solutions to achieve multiple benefits.
- For residential development, design for a minimum water efficiency of 110 l/p/d, aiming to exceed this, utilising the principles of the water hierarchy;
- For non-residential, design for a minimum of 40% reduction in water consumption compared to a baseline building (see BREEAM methodology) whilst aiming to exceed this; and

7.1.1 The Core Strategy requires new development to adapt to the impacts of climate change. Consideration of climate change adaptation within the built environment is an amalgamation of discrete but connected issues such as overheating within buildings and thermal comfort, flood risk and sustainable drainage, water efficiency and reuse, the integration of Green and Blue Infrastructure (GBI), whilst designing for changing ground conditions, winds and damp.[46] Integration of these competing issues into sustainable design within development needs to be carefully considered, whilst complementing the requirements for climate change mitigation through energy efficiency.

7.1.2 Existing housing stock in the UK faces challenges in adequately addressing a changing climate, partly due to the age profile of buildings, but also due to 'issues with knowledge, skills, supply chains, occupant behaviour and quality assurance'[46]. It is therefore imperative that new housing and developments brought forward meet and exceed performance requirements of the Core Strategy, utilising the guidance in this SPD, to avoid costly retrofitting in the future. Future-proofing of new development encourages well-designed sustainable development, with the ease of

[46] Kovats and Brisley (2021). UK Climate Risk Independent Assessment (CCRA3) Technical Report Chapter 5: Health, Communities and the Built Environment (Online). Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Chapter-5-FINAL.pdf

ability to adapt to changing environmental, social and economic conditions over the lifetime of the development.

7.1.3 The 2021 update to the NPPF sends the clear signal that climate change adaptation should be integral to new development:

"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."

7.1.4 Planning policy around adaptation is intrinsically linked to the Building Regulations as set out within the SPD, and should be used to form the minimal performance requirements.

7.2 Adaptation Through Design

Resilience to Rising Temperatures

7.2.1 The latest assessment of the risks and opportunities facing the UK from climate change (UK Climate Change Risk Assessment i.e. CCRA3) noted limited incorporation of adaptation issues into planning policy as one of the significant barriers to addressing climate change risks.[46]

7.2.2 One of the major climate risks to the UK relates to high temperatures. The UK CCRA3 considers that the risks of combined exposure to high temperatures, air pollution, drought and wildfires could result in excess mortality. This is a higher risk for vulnerable community members such as those within residential care, older persons or persons with pre-existing conditions. Despite this, it notes that policies relating to the thermal comfort of occupied buildings were under-developed (see UK CCRA H1).

UK CCRA Risk H1: Risks to health and wellbeing from high temperatures.

While there is more evidence since CCRA2 about the risks of overheating in homes, hospitals and care homes, and the effectiveness and limitations of strategies for passive and space cooling, policies to protect people from overheating in new and existing homes and other buildings including care homes are still to be developed fully across the UK.

7.2.3 The introduction of Approved Document Part O in 2022 directly addresses design of residential development. It directly addresses how to minimise unwanted solar gains in summer periods and ensure adequate removal of heat from the indoor environment.

7.2.4 The rationale in Part O recognises that buildings with increasingly efficient insulation and airtightness are at risk of overheating if their design does not adequately address ventilation requirements.[47] It therefore supplements Part F requirements for ventilation standards, while also promoting natural removal of heat so as to avoid additional energy requirements associated with mechanical systems,

[47] Morten, W. (2015). Strategies for mitigating the risk of overheating in current and future climate scenarios: Applying lessons from PassivHaus to contemporary housing. (Online). Available at: https://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Insight%20-%20December%202015%20-%20Mitigating%20Oveheating%20Risk%20in%20Future%20Climates.pdf

which would conflict with targets for reducing the energy intensity of dwellings set out in Part L.

7.2.5 Within non-residential buildings, the BREEAM UK New Construction and BREEAM Refurbishment and fit-out guidance sets out what exemplary performance with respect to climate change adaptation looks like. This includes criterion Hea 04 Thermal comfort, which addresses risks of overheating, alongside ventilation design.

BREEAM Exemplary performance in climate change adaptation

✓ **Hea 04** Thermal modelling results in thermal comfort, limiting the risk of overheating, taking into account future climate change projections within the modelling inputs.

✓ **Mat 05** Buildings are designed for durability and resilience to future environmental conditions with climate change.

7.2.6 Exemplary performance also includes avoiding increased risks of deterioration and higher maintenance demands due to the impacts of climate change previously mentioned (driving rain, winds, heat related deterioration). By achieving Mat 05 Designing for durability and resilience the development should demonstrate exemplary performance where the exposed parts of the building are protected from material degradation from environmental factors including climate change, where water ingress and damage is prevented. This includes designing for maintenance (e.g. ease of access for replacement, cleaning and repair).

7.2.7 Increased internal temperatures pose serious health implications.[48] Thermal discomfort within buildings is directly correlated with increasing external temperatures; however, a range of conditions are at play which may be individual to the occupier and there is no single value for indoor temperature which is considered comfortable. Therefore, it is imperative that building design allows for flexibility in removing heat from the building.

7.2.8 In addition to whole-building consideration of overheating, there may be localised overheating associated with high glazing proportions, restriction of window opening, internal heat sources and a lack of shading objects.[49]

7.2.9 Window opening will become an increasingly ineffective method for cooling as external temperatures continue to increase. Shading and ventilation (i.e. passive and/or mechanical) are key to naturally controlling overheating in the summer months; key design measures are within **Table 7.1**.

[48] Race, G. L. (2010). CIBSE Knowledge Series: KS16 How to manage overheating in buildings. London, England: Chartered Institution of Building Services Engineers.
[49] Palmer, J. (2021). Avoiding summer overheating. Guidelines for summer comfort in PassivHaus buildings and the PHT Summer overheating tool. (Online). Available at: https://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Papers/Avoiding%20summer%20overheating.pdf

Table 7.1 Types of cooling measures that can be incorporated into design of residential and non-residential buildings[47]

	Type of cooling	Examples
	Ventilation	Displacement ventilation, opening windows, night purging, breathing buildings
	Internal shading	Blinds, curtains, shutters, films on glass to reduce shading – bird friendly film in particular
	External shading, especially for south facing facades	Overhangs, shutters, Brise Soleil, recessed glazing, vegetation, fins
	Thermal mass	Exposed concrete floors and ceilings, thick stone/block walls on south/west facades, masonry partitions
	GBI	Green roof, green walls, planting around building
	Building form	Reduce glazing size, locate glazing away from sun, glazing to limit solar gain e.g. low g-value glass
	Reducing occupant input	Automatic controls
	Reflective	Reflective roof, solar control glass, white paint
	Active cooling	Air Conditioning units, reversible heat pumps, district cooling

Figure 7.1 Brise Soleil, Chobham Road, Woking Town Centre

Box 7.2 Case Study: Moor's Nook, Retirement Village, Woking[50]



Moor's Nook is a high-specification retirement village near Horsell Common. The development contains an integrated south-facing courtyard, complementing aspects of the nearby green space. Natural light was used where possible whilst understanding any conflicts with unwanted solar gains with an overheating assessment. It was demonstrated that several living rooms were subject to overheating through solar gain, therefore a number of measures were employed: the use of low g-value windows; high specification glazing; and blinds or curtains. This reduced this risk to an acceptable level. Additionally, natural ventilation was provided through openings, windows and roof lights, maximising air changes.

7.2.10 The case study within **Box 7.2** shows how the overheating assessment highlighted additional design measures to be considered. However, the assessment did not include an analysis of the changing future climate, which is a requirement for new developments subject to this current guidance.

7.2.11 Nature based solutions (NBS) can be applied at the property-level to address the impacts of overheating through natural shading with vegetation. Beyond overheating within buildings, the health and wellbeing of the population may become impacted by increasing experience of the urban heat island effect associated with urban areas. This has strong links with the integration of urban cooling measures such as green infrastructure and NBS, explored further in this section.

7.2.12 Further guidance in terms of design considerations can be found in the references noted here:

- **Approved Document Part O: Overheating for further technical guidance.**
- **CIBSE, 2013. TM52 The limits of thermal comfort: avoiding overheating in European buildings.**
- **CIBSE, 2019. TM59 Design methodology for the assessment of overheating risk in homes.**

[50] Milieu Consult (2015). Energy Strategy.

Resilience to Flood risk

Box 7.3 Core Strategy – Flood Risk Policies

CS9: Flooding and water management

The Council will require all significant forms of development to incorporate appropriate sustainable drainage systems (SUDS) as part of any development proposals. If this is not feasible, the Council will require evidence illustrating this.

7.2.13 The UK Climate Change Risk Assessment (CCRA3) highlights the aspects of society which are, and could become more at risk, from flooding, this includes our services (Risk I2), people, communities and flooding (Risk H3) and businesses (Risk B1). An aim of our Climate Change Strategy is to work with partners to implement flood risk management activities across the Borough. Nevertheless, individual new developments need to ensure flood risk / resilience is a key consideration as part of local climate adaptation, accounting for projected future climate change in the design of any flood resilience measures. Designs also need to take into account the flood risk implications of impermeable materials associated with urban environments, such as concrete, asphalt, tarmac and artificial lawns which can increase the risk of flooding through water runoff.

7.2.14 The Surrey Local Flood Risk Management Strategy 2017 – 2032[51] highlights that new development has increased the importance of holistic drainage systems design that is both sustainable and does not increase the risk of flooding elsewhere in the catchment. There are opportunities presented through the planning of new development to make communities more resilient to climate change. A key element of this is use of sustainable drainage systems (SuDS)[51], as required by Policy CS9 (see **Box 7.3**).

UK CCRA Risk I2: Risks to infrastructure services from river, surface water and groundwater flooding.

UK CCRA Risk H3: Risks to people, communities and buildings from flooding.

UK CCRA Risk B1: Risks to business from flooding.

Communities, infrastructure assets and business sites will face increased exposure to surface water risk in absence of adaptation action.

7.2.15 SuDS are designed to maximise benefits from the management of surface water, by controlling the quantity and quality of runoff as well as providing larger areas of green and blue infrastructure (GBI) supporting enhanced biodiversity in neighbourhoods.[52]

7.2.16 SuDS can be used within residential and non-residential development, even when spatially constrained (see examples of use in **Figure 7.4**). Early consultation is imperative for the most effective use of SuDS in development, engaging cross-topic specialists such as landscape architects, flood risk engineers, ecologists and spatial planners. The principles of SuDS design in development are within **Table 7.2**.

[51] Surrey County Council (2016). Surrey Local Flood Risk Management Strategy 2017 – 2032 (Online). Available at: https://www.surreycc.gov.uk/__data/assets/pdf_file/0005/136724/Surrey-Local-Flood-Risk-Management-Strategy-FINAL_v2.pdf

[52] CIRIA (2015). The SuDS Manual. London, England: CIRIA.

7.2.17 The Council supports proposals that integrate natural based solutions (NBS) within plans to mitigate flooding and provide further benefits such as increased biodiversity and the creation of green spaces.

7.2.18 It is the responsibility of a developer to make proper provision for surface water drainage to ground, water courses or surface water sewer. Development must not be allowed to drain to the foul sewer, as this is the major contributor to sewer flooding. In May 2022 the Environment Agency updated the guidance on flood risk assessment in relation to climate change allowances[53].

7.2.19 On sites with historical or archaeological constrains, a historic water management appraisal of an area should be included as part of flood risk assessment and planning submissions.

7.2.20 It is advised that developers reach out to the lead local flood authority (LLFA) for confirmation regarding the suitability of SuDS within their proposed development. Surrey County Council act as LLFA and provide guidance on SuDS[54]. It is advised that developers review this guidance when considering how best to address water management.

Table 7.2 Principles of SuDS design[52]

Principles of SuDS design			
	Using surface water runoff as a resource		Promoting evapotranspiration
	Managing rainwater close to where it falls		Slowing and storing runoff to mimic natural runoff characteristics
	Managing runoff on the surface		Reducing contamination of runoff through pollution prevention and controlling the runoff at source
	Allowing rainwater to soak into the ground		Treating runoff to reduce the risk of urban contaminants causing environmental pollution.

Rain Gardens

Rain gardens are areas of shallow greenspace, usually featuring plantings such as hedges, trees and flowers. They are intended to absorb surface run-off and can contribute towards a wider SuDS strategy. New developments are encouraged to seek opportunities to establish rainwater gardens as part of ambitions to integrate green infrastructure, and thereby contribute towards Woking's initiative to reduce local flood risk, improve water quality, and

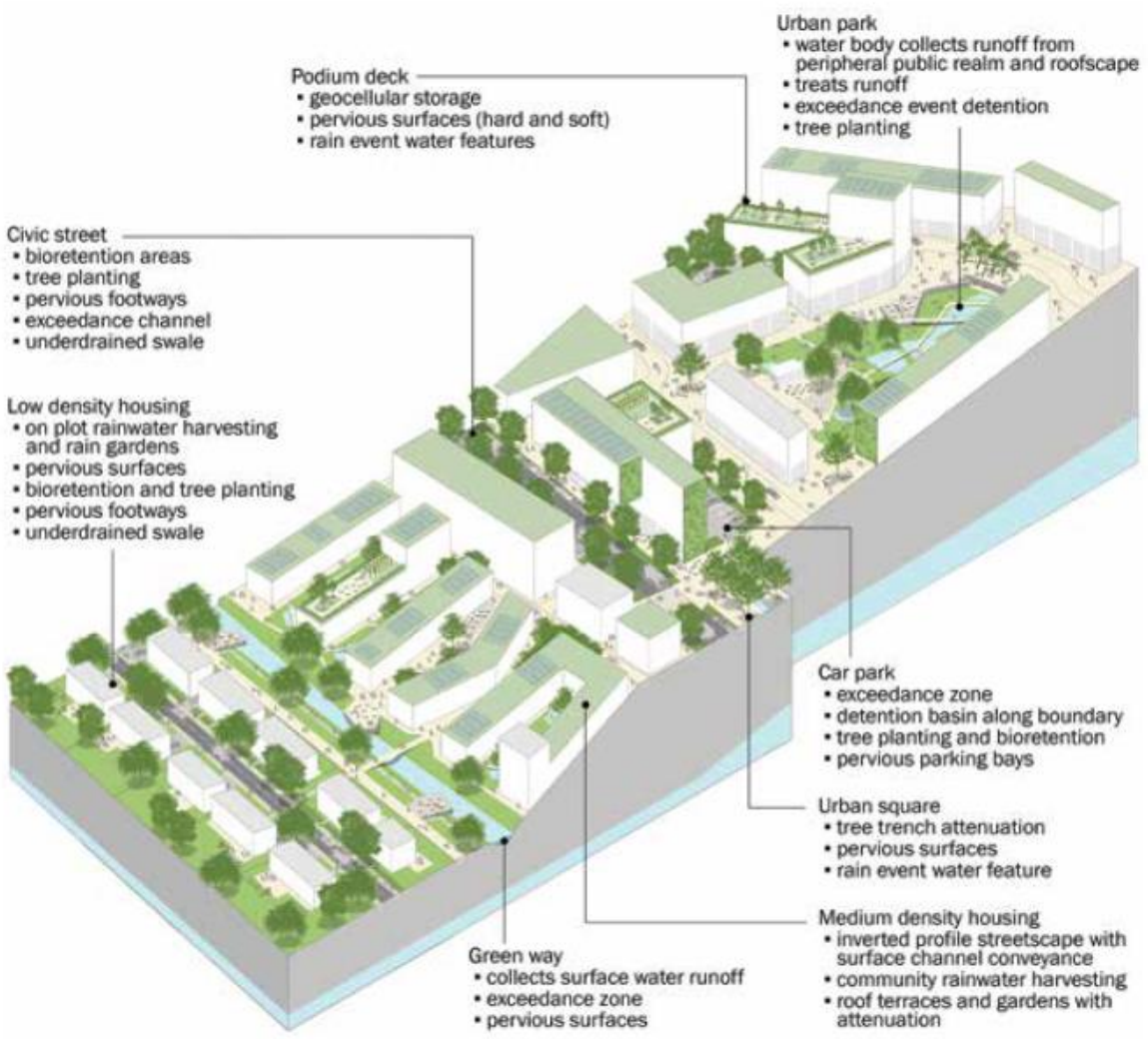
[53] Environment Agency (2022). Flood risk assessments: climate change allowances. Available here: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[54] Surrey County Council (2022). Sustainable Drainage System Design Guidance. Available here: https://www.surreycc.gov.uk/community/emergency-planning-and-community-safety/flooding/more-about-flooding/suds-drainage/drainage-guidance

enhance biodiversity. There are several planning and design considerations associated with rainwater gardens, that must be taken into account to ensure successful delivery.

In urban environments the planting of street trees also provides a natural solution to mitigate against flood risk. It is advised that the principles of 'Right tree, right place' are applied to ensure trees remain suitable and best placed to mitigate against all the effects of climate change.

Figure 7.2 Rainwater Garden, Chertsey Road

Figure 7.4 Application of SuDS in different environments[52]



7.2.21 Non-residential development can demonstrate exemplary performance related to climate change adaptation through BREEAM by targeting the Pol 03 Flood and surface water management credits to minimise the risks of increased flood risk and surface water run-off affecting the site or other receptors in the catchment. This entails:

- Flood resilience: A site-specific Flood Risk Assessment (FRA) confirms that the development either remains within a location of low flood risk, even after taking into account future sources of flooding with climate change or demonstrates that measures to increase the resilience to future flooding is incorporated into the final design of the building.

BREEAM Exemplary performance in climate change adaptation

✓ **Pol 03 Flood resilience** Designing to be resilient to future sources of flooding with climate change.

✓ **Pol 03 Surface water run-off** Drainage measures which improve peak rate and/or volume of run-off including climate change allowances.

- Surface water run-off: Sustainable design of surface water management measures where all calculations must include an allowance for climate change, made in accordance with current Planning Practice Guidance (PPG). Ease of maintenance must be integrated into SuDS design.

Water Availability and Efficiency

7.2.22 In the coming century, there will be increasing pressure on water demand largely due to population growth and climate change effects on resource availability.[55] This has been reported in the UK Climate Change Risk Assessment (CCRA3) as a risk to public water supplies due to reduced water availability (Risk I8) and the knock-on effect to the public of periods of water scarcity (Risk H10). To place this in a local context, the majority of the water supplied by Affinity Water comes from groundwater sources[56]. Groundwater abstraction is highly dependent on rainfall. Changing patterns of rainfall in summer (see **Box 8.3**) increase the risk of stress on the potable water supply to Woking.

UK CCRA Risk H10: Risk to household water supply.

Reduced summer precipitation will increase the likelihood of periods of water scarcity.

UK CCRA Risk I8: Risk to public water supplies from reduced water availability.

Simulating future water balances show a UK-wide supply-demand deficit.

7.2.23 The policies within the Core Strategy related to water efficiency are summarised in **Box 7.4**.

Box 7.4 Core Strategy Policies – Water Efficiency

CS22: Sustainable Construction

New residential development on previously developed land will be required to meet the… water components of the Code for Sustainable Homes… Code level 5 from 1 April 2016.

New residential development on greenfield sites will be required to meet the Code for Sustainable Homes level 5 (or any future national requirement).

New non-residential development of 1,000 sq.m or more (gross) floorspace is required to comply with BREEAM very good standards (or any future national equivalent).

The Council will encourage proposals for residential extensions and non-residential developments of 1,000 sq.m or less (gross) floorspace to incorporate energy and water efficiency measures.

7.2.24 Since the adoption of the Core Strategy, the Code for Sustainable Homes (CfSH) has been withdrawn and replaced by the requirements of the Building Regulations

[55] Lawson, R., et al. (2018). Ofwat: The long term potential for deep reductions in household water demand (Online). Available at: https://www.ofwat.gov.uk/wp-content/uploads/2018/05/The-long-term-potential-for-deep-reductions-in-household-water-demand-report-by-Artesia-Consulting.pdf

[56] Affinity Water (2022). Affinity Water Drought Plan: Strategic Environmental Assessment Environmental Report (Online). Available at: https://www.affinitywater.co.uk/docs/corporate/SEAconsultation/Drought-Plan-2022-Strategic-Environmental-Assessment-Environmental-Report.pdf

Part G: Sanitation, hot water safety and water efficiency.[57] the Council implements the optional requirements for water efficiency as set out within Building Regulations 2010 (as amended), as follows:

> **All new residential development will be required to achieve as a minimum the optional requirement set through Building Regulations for water efficiency that requires estimated water use of no more than 110 litres/person/day[58]. This should be set out within a statement clarifying how the measures have been achieved.**

7.2.25 The Council will ensure compliance by means of planning conditions specifying that the optional requirement as set out above will apply to the development. Applicants are encouraged to submit the required evidence at the earliest opportunity – preferably at planning application validation stage. If sufficient evidence is not submitted at planning application validation stage, or during the life of a planning application, a pre-commencement planning condition will be used to confirm that the development will be able to achieve the required standard prior to construction starting; and evidence should be in the form of a design stage water efficiency calculator (as per the methodology set out in Appendix A of Approved Document G).

7.2.26 In all cases, a pre-occupation planning condition will be used to conclusively show that the standard has been achieved prior to the occupation of dwellings; and evidence will be in the form of the notice submitted to the local authority under Regulation 37 of the Building Regulations 2010, as amended (see paragraphs 2.13-2.16 of Approved Document G for guidance).

7.2.27 People who are responsible for building work (e.g., agent, designer, builder or installer) must ensure that the work complies with all applicable requirements of the Building Regulations. Where an optional requirement is made a condition of the planning permission the developer has a statutory obligation to inform the Building Control Body that an optional requirement has been imposed. A local authority may not issue a completion certificate under regulation 17 of the Building Regulations or an approved inspector a final certificate under section 51 of the Building Act unless satisfied that any imposed optional requirement has been complied with.

7.2.28 This is a minimum expectation; the Council encourages developers to seek greater efficiency in seeking to future proof development against possible water scarcity.[53] The energy demand implications of water consumption are also an important consideration for the energy efficiency of developments.

7.2.29 All the water companies which serve Woking have been identified by the Environment Agency as companies within areas of serious water stress[59]. In addition to following the optional requirement outlined above, the council advises

[57] Ministry of Housing, Communities & Local Government (2016). Sanitation, hot water safety and water efficiency: Approved Document G. Available at: https://www.gov.uk/government/publications/sanitation-hot-water-safety-and-water-efficiency-approved-document-g
[58] The optional requirement is set out under Part G of Schedule 1 and regulation 36(2b).
[59] Environmental Agency (2021). Water stressed areas – final classification. Available at: https://www.gov.uk/government/publications/water-stressed-areas-2021-classification

that the 'Fittings Approach' is used to determine the water consumption of a development[60].

7.2.30 Currently, it is estimated that average water consumption in homes in the UK is in the region of 142 l/p/d[61]. Even using technology and products that are available on the market today, water consumption can be reduced to 85 l/p/d by water efficient fittings, changing behaviours and the installation of rainwater harvesting.[62] Ofwat projections suggest it is possible to achieve 50 – 70 l/p/d within 50 years; other research within the UK domestic homes sector suggests water demand can be reduced to 49 l/p/d.[57]

7.2.31 Within non-residential buildings, BREEAM UK New Construction and BREEAM Refurbishment and fit-out guidance sets out exemplary performance targets with respect to water consumption (Wat 01). The minimum standard is to achieve 12.5% reduction in water consumption from the baseline; however, exemplary performance entails a minimum of 40% which equates to a minimum of three credits. This ensures water demand is minimised in periods of droughts.

BREEAM Exemplary performance in climate change adaptation

✓ **Wat 01** A minimum of 40% reduction in water consumption compared to a baseline building to ensure water demand is minimised in periods of droughts.

7.2.32 The WaterWise Water Efficiency Strategy[63] for the UK sets out an important strategic objective for the future of water consumption within homes which is to ensure new development does not put additional pressure onto future water availability challenges and introduces the aspiration for homes to be 'water neutral', (see **Box 7.5**).

Box 7.5 Key Term: Water Neutrality[57]

Key term: Water Neutrality

Where proposals for development seek to achieve water neutrality, water demand should be minimised first, then any remaining water demand offset, so that the total demand on the public water supply in a defined region is the same after development as it was before.

7.2.33 Water neutrality is implemented by following the water neutrality hierarchy (see **Figure 7.2**), where the key water reduction measures that are applicable and under the influence for new development are:

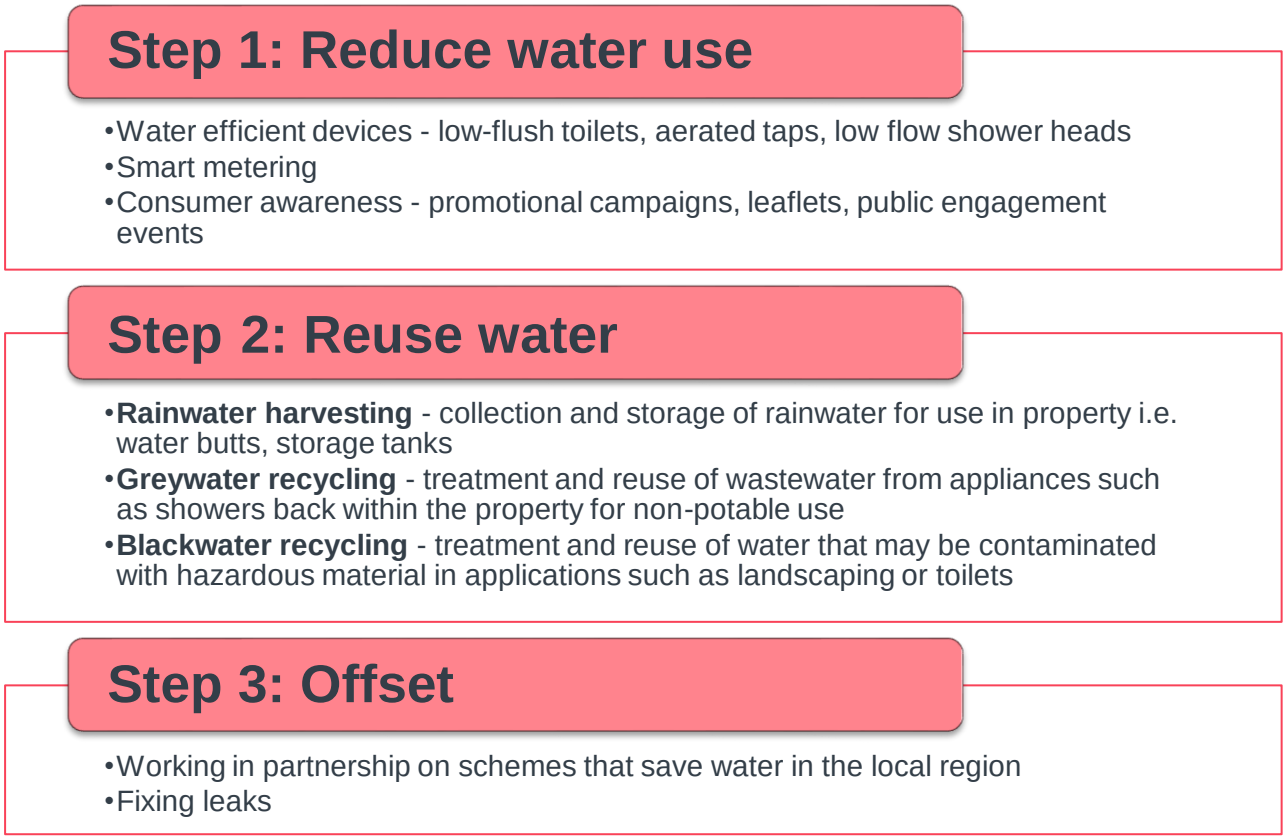
[60] [Requirement G2] Para 2.11 states: *"Where the fittings approach is used, the water consumption of the fittings provided must not exceed the values in Table 2.2. If they do, the water efficiency calculator must be completed to demonstrate compliance. Similarly, where a shower is not to be provided or where a waste disposal unit, a water softener or water re-use is to be provided the water efficiency calculator must be completed."* Refer Approved Document G for full details.

[61] Energy Saving Trust (2013). At home with water. (Online). Available at: https://www.energysavingtrust.org.uk/sites/default/files/reports/AtHomewithWater%287%29.pdf

[62] Makin, L. et al. (2021). WaterWise: A Review of Water Neutrality in the UK. (Online). Available at: https://database.waterwise.org.uk/wp-content/uploads/2021/10/A-Review-of-Water-Neutrality-in-the-UK-03.02.2021-1-1.pdf

[63] WaterWise (2022). UK Water Efficiency Strategy to 2030. (Online). Available at: https://database.waterwise.org.uk/wp-content/uploads/2022/09/J37880-Waterwise_Water_Efficiency_Strategy_Inners_Landscape_WEB.pdf

Figure 7.2 Water hierarchy



7.2.34 Rainwater harvesting (RWH) for potable and non-potable use can be applicable to single dwellings or to larger systems in commercial sites or community scale applications. RWH can be integrated with the design of surface water attenuation (as described in this section) such as SuDS and utilising green infrastructure such as reed beds to filter water, all linking to provide multiple benefits. The Council encourages applications for new development, particularly residential, to implement RWH measures. For example, water butts are a low impact means of collecting water for use in domestic gardens.

7.2.35 Greywater recycling (GWR) from appliances such as showers is considered to have low levels of contaminants, requiring low levels of treatment for non-potable purposes. Up to 75% of the water consumed in residential properties becomes greywater. Typically, the water is treated using membrane-based technology.[64] GWH produces a net benefit for medium to significant buildings systems; these increase in size for individual households/shops.

7.2.36 A case study for water efficiency, RWH and GWR is found within **Box 7.6**.

BS 8525-1:2010 - Grey water systems – Part 1: Code of practice

[64] WaterWise (2020). Independent review of the costs and benefits of rainwater harvesting and grey water recycling options in the UK. Available at: https://www.susdrain.org/files/resources/evidence/Ricardo_Independent-review-of-costs-and-benefits-of-RWH-and-GWR-Final-Report.pdf

Box 7.6 Case Study: WWF Building, Woking Town Centre[65]

The WWF Building in Woking is the Head Quarters for the WWF. The WWF building applied the water hierarchy and sought to reduce consumption intensity in the first instance. Taps within WCs were fitted with 'passive infrared' motion sensors and showers have timer switches.

To reduce the amount of fresh water from the mains supply in necessary activities such as landscape watering and typical WC usage, the reuse of water was considering by the integration of rainwater harvesting into the design and operation of the building. Rain is collected from the roof, pavements, and other areas and attenuated in gutters and gullies and into attenuation tanks within the entrance level structure and onto an underground tank with the ability to hold. 35,000 litres.

On top of this, a greywater harvesting system was put in place to collect water from hand basins and showers reused within the WCs.

These systems were integrated with the SuDS design, where in the event of surplus rain, the excess is collected in the wetland area, with any additional overflow entering the Basingstoke Canal.

To show the many interactions with good master planning, the tree protection plan and landscape proposals were designed around the below-ground drainage system to minimise impact on tree stability.

[65] WWF (2017). The Story of WWF-UK's Living Planet Centre. Available at: http://assets.wwf.org.uk/custom/stories/lpc/

Green and Blue Infrastructure (GBI)

UK CCRA Risk N1: Risk to terrestrial species and habitats from changing conditions.

Potential for local and more widespread extinctions and losses.

7.2.37 A national ecological emergency and the risk of the widespread loss of species, is highlighted in the UK Climate Change Risk Assessment (CCRA3- Risk N1). This is being addressed within development management through the introduction of Biodiversity Net Gain (BNG) as a mitigation driver.

7.2.38 The Environment Act gained ascension in November 2021 and has a two-year transition period for its requirements to come into effect. The Department for Environment, Food and Rural Affaires (DEFRA) has confirmed that from January 2024 the Act will require mandatory BNG of 10% on all development sites for which planning permission is granted under the Town and Country Planning Act 1990 (there are a few exemptions). The Council does not have a Local Plan Policy which requires 10% BNG on site. However, it is important to note that the current up to date policies of the development plan highlights the need for biodiversity enhancement as a result of development, which needs to be applied when determining day to day planning applications until the mandatory requirements are introduced (see CS7 'Biodiversity and nature conservation'[66]).

7.2.39 As outlined within policy CS7 and CS8, the Council will pay consideration to important sites and habitats in the Borough. Proposals should acknowledge and mitigate against the direct and indirect impacts of development on these sites.

7.2.40 The emerging BNG legislation will enable a greater focus on the integration and extension of GBI to promote biodiversity and implement Natural Based Solutions (NBS). Thus, providing secondary benefits regarding climate mitigation actions in respect of both reducing urban heat island effects and offering additional shading benefits for buildings. All development should consider the long-term management and maintenance of green and blue infrastructure, to ensure continued climate change resilience and benefits across the Borough and wider landscape. This is supported under policy CS7.

7.2.41 It is anticipated that the Council will release further guidance in late 2023 which will set out how developers will be expected to implement mandatory BNG within proposals for development within Woking.

7.2.42 Local Nature Recovery Strategies (LNRS) are another form of spatial strategy made mandatory under the Environment Act 2021. LNRS cover the breadth of the UK and are designed to plan, map and guide investment in areas with opportunities for natural recovery, to the benefit of the wider Nature Recovery Network (NRN). It is anticipated that the LNRS will support BNG and act as a lever to implement Nature-based Solutions (NBS). Surrey County Council will lead the development of the LNRS in Surrey. Development in Woking will be asked to align with and help deliver the nature recovery priorities identified in the forthcoming LNRS, which will be produced over the coming 18 months.

[66] Woking Borough Council (2012) Woking Local Development Document. Woking Core Strategy. Available at: https://www.woking2027.info/developmentplan/corestrategy/adoptedcorestrategy.pdf

7.2.43 Biodiversity opportunity areas (BOAs) and urban BOAs also identify priority areas for habitat restoration and enable the increased implementation of NBS[67], helping to connect green infrastructure across the Borough and create green corridors.

7.2.44 A further important aspect of adaptation measures is the use of NBS[68]. These are defined as "actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits". In a local context, this means diversifying land use to integrate larger areas of natural vegetation ('green infrastructure') and water ('blue infrastructure') within our urban environment. These are explored in more detail in **Section 7.2.**

7.2.45 Surrey County Council provide additional guidance on best practice and case studies for implementing green and blue infrastructure within development[69].

Box 7.7 Key term: Green and Blue Infrastructure (GBI)

Key term: Green and Blue Infrastructure (GBI)

A network of nature-based features based on vegetation (green), water (blue), or both, integrated into typically grey infrastructure development. Examples of these features are parks and gardens, natural and semi-natural green space, green corridors, green roofs, green walls, grassed areas, outdoor sports facilities, allotments and urban farms, river and canal corridors, SuDS, rain gardens, swales, trees, ponds, amongst others. GBI is important as a climate change mitigation and adaptation measure and has a host of wider benefits to people and wildlife.

7.2.46 The importance of nature conservation and provision of open space and green infrastructure is already recognised through Core Strategy policies CS7 and CS17 (see **Box 7.8**).

[67] Surrey Wildlife Trust (n.d.) Biodiversity Opportunity Areas. Available at: https://www.surreywildlifetrust.org/what-we-do/restoring-surreys-nature/biodiversity-opportunity-areas
[68] International Union for Conservation of Nature and Natural Resources (2020). Global Standard for Nature-based Solutions (Online). Available at: https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf
[69] Surrey County Council (2023) Green and blue infrastructure: best practice and case studies. Available at: https://www.surreycc.gov.uk/community/climate-change/what-are-we-doing/green-and-blue-infrastructure

Box 7.8 Core Strategy - Green and Blue Infrastructure Policies

CS7: Biodiversity and nature conservation

The Council will encourage new development to make positive contribution to biodiversity through the creation of green spaces, where appropriate, and the creation of linkages between sites to create a local and regional biodiversity network of wildlife corridors and green infrastructure. It will seek to retain and encourage the enhancement of significant features of nature conservation value on development sites.

CS17: Open space, green infrastructure, sport and recreation

All new residential development (other than replacement dwellings) will be required to contribute towards the provision of open space and green infrastructure.

Developers will be expected to contribute to provision through the Community Infrastructure Levy (CIL) or on larger sites through on-site provision and/or a S106 contribution as appropriate.

Development which would create additional pressures on the Green Infrastructure network should, as part of the planning process, incorporate details of how it is intended to mitigate against these pressures.

The Council encourages the improvement of the quality and quantity of the Green Infrastructure.

7.2.47 The Borough's Climate Emergency Action Plan recognises that the ecological emergency should be addressed in tandem with the climate emergency. Woking Borough Council are capturing strategies to address the ecological emergency through the Natural Woking Strategy.[70] This includes a built environment that is developed sustainably by weaving the ambition for biodiversity and GBI into the Borough, enhancing accessibility to green space.

Natural Woking: Strategy.

7.2.48 Adopted in 2016, Natural Woking provides the Council's strategy for biodiversity and green infrastructure. It promotes the far-reaching benefits of biodiversity and accessible natural spaces within the Borough, such as improved health and wellbeing of visitors and residents, and resilient wildlife.

7.2.49 The benefits of outdoor activities to the health and wellbeing of residents and visitors to the Borough are well known, including the opportunity to grow access to bridleways / footpaths, and integrate with existing green infrastructure. The benefits of green infrastructure have secondary impacts such as natural shading and reducing the urban heat island effect (improving wellbeing of residents during higher temperature events). These benefits are defined as 'ecosystem services'. Examples of these ecosystem services in a residential context, and what benefits these bring is shown in **Figure 7.3**.

[70] Woking Borough Council (2016). Natural Woking: Biodiversity and Green Infrastructure Strategy. Available at: https://www.woking.gov.uk/sites/default/files/documents/Nature/nwstrategy.pdf

Box 7.9 Key Term: Natural capital and ecosystems services[71]

Natural capital is the term for stocks of the elements of nature that have value to society, for example, forests, rivers, and biodiversity.

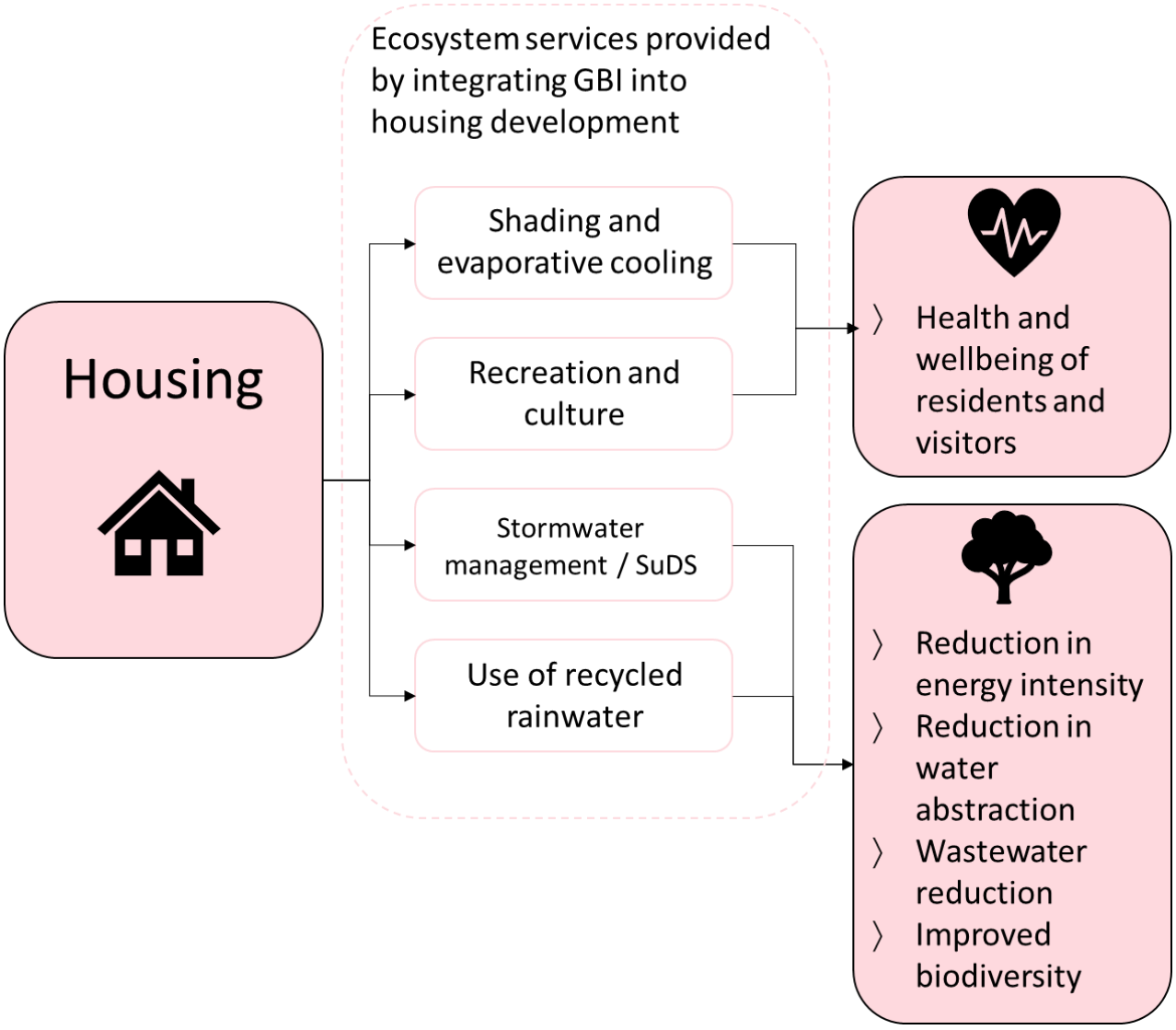
Stocks of natural capital provide flows of environmental or ecosystem services over time, these include:

- Provisioning services – outputs that can be obtained from ecosystems for human needs such as food, timber, water supply, crops
- Regulating services – ecological processes that regulate and reduce pollution such as carbon sequestration, water regulation.
- Cultural services – environmental settings that enable cultural interaction and activity such as recreation, education and tourism.
- Flows of natural capital – flows which aren't dependent on ecosystems such as minerals, solar, wind and tidal power.

A natural capital approach reframes nature positively as an asset that can support a range of social and economic outcomes, rather than simply as a constraint on or a victim of policy or development.

[71] Department for Environment, Food & Rural Affairs (2021). Enabling a Natural Capital Approach guidance. Available at: https://www.gov.uk/government/publications/enabling-a-natural-capital-approach-enca-guidance/enabling-a-natural-capital-approach-guidance#introduction-to-natural-capital

Figure 7.3 Systems mapping of the GBI role in the urban system resulting in socio-economic benefits, adapted[72]



7.2.50 Nature based solutions and green infrastructure should underpin climate change adaptation measures, while also being used within development design work addressing impacts such as overheating and flooding. Over time this will improve on the current situation, since an increase in habitat extent, condition and connectivity will improve the resilience of natural assets to climate change. This has a parallel benefit in enhancing the climate resilience of homes and businesses.

[72] Brown, K., and Mijic, Dr. A., (2019). Granthan Institute Briefing Paper No. 30: Integrating green and blue spaces into our cities: Making it happen. (Online). Available at: https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Integrating-green-and-blue-spaces-into-our-cities---Making-it-happen-.pdf

Box 7.10 Case Study – Dukes Court, Woking Town Centre[73]

Dukes Court was extensively refurbished between 2019 and 2021 as part of a £77 million regeneration scheme in Woking. Originally built in 1986, Dukes Court was viewed as a symbol of Woking's economic growth offering 220,000 sq. ft. of office accommodation. The refurbishment of the iconic office building at the centre of Dukes Court included a 460 m^2 "ANS Living Wall System" believed to be the tallest green wall in the UK outside of London. The green wall is estimated to extract 598 kg of carbon per year whilst producing 782 kg per year of O_2. The wall also aims to support local biodiversity and improve the air quality, through the use of soil, bird boxes and providing a variety of pollinators throughout the seasons. As well as the implementation of the green wall the development also included new drainage works along with, construction of a restaurant, resurfacing of pedestrian footways and parts of Duke Street, Locke Way and Chertsey Road, creation of new drop off and pick up area and creation of five new disabled parking bays on Duke Street.

7.2.51 Other examples used throughout the Borough include the WWF Living Planet Centre building use of a green roof for bike and storage sheds. The green roof used sedum and saxifrage and low-growing perennial plants which improve biodiversity and can soak up excess rainwater. Taking into account future climate change, the species chosen were drought-tolerant and required little maintenance, to ensure the continued effectiveness.

[73] Dukes Court. Available at: http://dukescourt-woking.co.uk/

Box 7.11 Case Study: Hoe Valley Regeneration[74]

As part of the Hoe Valley Regeneration Scheme to reduce flood risk in Woking (introduced in the Flood Risk section above), extensive public open space including a new community centre, two new play parks, footpaths and cycleways, habitat reinstatement and new habitat creation integrated into the development including planting 1,000 saplings, creating ponds, installing bat boxes and creating habitats for water voles and great crested newt, a low maintenance living roof.

Refer to any upcoming guidance from Woking Borough Council for the implementation of Biodiversity Net Gain in development.

[74] ThamesWey (2012). Hoe Valley Scheme. Available at: https://www.thamesweygroup.co.uk/case-study/hoe-valley-scheme/

8. Glossary

Term	Definition
Adaptation	The process of adjustment in a design or operational procedure to respond to the projected impacts of climate change, in order to moderate harm or exploit beneficial opportunities.
Biodiversity	The variety of life on Earth, including plants, animals and micro-organisms which, together, interact in complex ways with the inanimate environment to create living ecosystems.
Biomass	A fuel derived from plant material or natural residues. A wide range of biomass can be used to generate electricity and / or heat and to produce transport fuel.
Carbon	'Carbon' is used as shorthand to refer to the basket of seven GHGs recognised by the Kyoto Protocol.
Carbon dioxide equivalent (CO_2e)	Carbon dioxide equivalent (CO_2e) is a term for describing different GHGs in a common unit. For any quantity and type of GHG, CO_2e represents the amount of CO_2 which would have the equivalent global warming impact.
Carbon neutral	A development that achieves no net carbon emissions of energy use on an annual basis. It is usual for a development to have emitted some GHG emissions, so it is necessary to use carbon offsets to achieve neutrality.
Combined Heat and Power (CHP)	Technology for generating usable heat and power efficiently, and supplied to buildings or a network. In practice it is often combined with a Decentralised Energy Network (DEN) as it works best with a constant, large demand for heat.
Climate change	The UNFCCC, in its Article 1, defines climate change as: "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*". While climate change can be attributable to natural causes, the UNFCCC distinguish climate change as related to human activities altering the atmospheric composition and climate variability.

Term	Definition
Climate change impact	An impact from a climate trend which affects the ability of the receptor or asset to maintain its function or purpose.
Combined heat and power (CHP)	The simultaneous generation of usable heat and power in a single process, therefore producing less waste. CHP's overall fuel efficiency is around 70-90% of fuel input compared to 40-50% efficiency in conventional generation.
Decentralised Energy Network (DEN)	A system of pipes and cables that move energy in the form of electricity, hot or chilled water from where it is created, directly to where it is needed. These systems replace the conventional arrangement of each building using individual on-site generation equipment, such as boilers or chillers, serving one site only. A DEN is generator-technology-neutral, meaning the heat, cooling or power may come from boilers, heat pumps, CHP, waste heat sources or other sources.
Decentralised energy supply	Energy supply from low carbon sources on a small or community scale and including electricity generation that is connected to a local distribution network rather than directly to the national grid.
Dwelling Emissions Rate	DER is the actual emission rate of the proposed building i.e., self-contained dwellings and individual flats (excluding communal areas). To remain in compliance with Part L (Buildings Regs 2021) the DER figure should not exceed the TER.
Design and Access Statement	A document which must accompany most types of planning applications explaining the design process for a development and providing details on how it can be accessed by everyone.
District Heat Network	Also known as Heat Networks – comprises the physical infrastructure for the generation, distribution and consumption of heat. This can be at a large scale - such as an area-wide scale – or small scale such as a central boiler house supplying a single block of flats.
Embodied carbon	The embodied carbon describes the carbon footprint of a material, allowing for the sum of the energy required in resource extraction, and any processing required, as well as the transport and supply logistics to the factory gate.
Energy Statement	A document which provides the specification for meeting the required energy targets including a calculation of the carbon emissions for a development and is a useful in demonstrating compliance with CS22.

Term	Definition
Forest Stewardship Council accreditation	FSC ensures that products are sourced from responsibly managed forests i.e., the harvest of timber and non-timber products with accreditation won't have a detrimental effect on forest ecology and promotes long-term viability.
Future-proofing	Future-proofing of new development encourages well-designed sustainable development, with the ease of ability to adapt to changing environmental, social and economic conditions over the lifetime of the development
Green and Blue infrastructure	A network of nature-based features based on vegetation (green), water (blue), or both, integrated into typically grey infrastructure development.
Greenhouse gas (GHG) emissions	GHG emissions are determined by the Kyoto Protocol (1997) to include seven gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride.
Ground source heat pumps	Transfer the heat from the earth to a building by means of a heat exchanger. The heat can then be used for space heating and hot water. They can also be used to remove heat from a building and deposit it into the ground to cool the building in hot weather.
Local Development Framework (LDF)	A term used to describe a folder of documents, which includes all the Local Planning Authority's Local Development Documents, including the Core Strategy and other Development Plan Documents, Supplementary Planning Documents, and the Statement of Community Involvement amongst others.
Low or Zero Carbon (LZC) Technologies	Technologies that produce energy with low or zero carbon emissions.
Nature based solutions	Actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits
Net zero GHG emissions	Reduction in net GHG emissions by at least 100% below 1990 levels by 2050 (the 'UK carbon target', often referred to as 'net zero').
Passive solar gain	Refers to the siting, form, fabric and internal layout of buildings so that natural light and solar heat gains are harnessed and controlled reducing the need for artificial lighting, space heating, mechanical ventilation / cooling.

Term	Definition
Photovoltaics (PV)	Thin silicone wafers that convert any light, not only sunlight, directly into electricity. They can be fitted to buildings including panels and roof tiles.
Planning conditions	Sets of further actions / commitments placed on consent to enable development proposals to proceed where it would otherwise have been necessary to refuse planning permission.
RCP8.5	RCP8.5 is considered a high emissions pathway and represents a potential future which is slow to transfer to low-carbon energy provision. With progress towards achieving National Determined Contributions, RCP8.5 is considered a possible, but conservative, emission scenario. RCP8.5 specifies the concentration of GHGs that would result in 8.5 W/m^2 radiative forcing at the top of the atmosphere by 2100, relative to pre-industrial levels. The increase of global mean surface temperature by the end of the 21st century (2081–2100) relative to 1986–2005 is likely to be 2.6°C to 4.8°C under RCP8.5.
Renewable energy	Those energy flows that occur naturally and repeatedly in the environment - from the wind, the fall of water, the movement of the oceans, from the sun and also from biomass.
Representative Concentration Pathway (RCP)	UKCP18 produces data for a range of scenarios projecting future emissions and concentrations of GHGs in the atmosphere, known as representative concentration pathways (RCPs). Each pathway is derived from international projections published in the Intergovernmental Panel on Climate Change's 5th Assessment Report
Standard Assessment Procedure (SAP)	This is a Government standard for energy rating of all new dwellings, and is now a compulsory component in Part L of the Building Regulations. It calculates the typical annual energy costs for space, water, heating and lighting, as well as CO2 emissions.
Supplementary Planning Document (SPD)	A Local Development Document that adds further detail to policies and proposals in a 'parent' Development Plan Document. Unlike Development Plan Documents, SPDs do not form part of the statutory development plan.
Sustainability Appraisal	An appraisal of the economic, environmental and social effects of a plan from the outset of the preparation process to allow decisions to be made that accord with sustainable development.
Sustainable Drainage Systems (SUDS)	Drainage solutions that provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby

Term	Definition
	watercourses. SUDS aim to reduce surface water flooding, improve water quality and enhance the amenity and biodiversity value of the environment.
Target Emissions Rate	This is the pre-defined building specification and sets the minimum standard permitted for the energy performance of a proposed building.
UKCP18	UK Climate Change Projections 2018 (UKCP18) is the most up-to-date assessment of how the climate of the UK may change over the 21st century. UKCP18 uses climate science to provide observations and climate change projections for the UK and globally until 2100.
Urban heat island effect	Means that the urban area is significantly warmer than the surrounding rural area. The heat difference is mainly caused through urban development, lack of green and blue infrastructure and the generation of waste heat.
Vulnerability	The propensity or predisposition of a system or receptor to be adversely affected. This encompasses the sensitivity of the system or receptor and its capacity to cope and adapt.
Water neutrality	For every new development, water demand should first be minimised then any remaining water demand offset, so that the total demand on the public water supply in a defined region is the same after development as it was before.

Appendix A Further Legislative and Policy Context

International

The approach taken by the UK to addressing climate change has been shaped by a range of international agreements and climate change obligations including the Kyoto Protocol[75], the Paris Agreement[76] and the 2021 Glasgow Climate Compact[77] reflecting the UK's role as a signatory to the UNFCCC. The UK has set national mitigation targets in line with the globally recognised requirement to urgently limit GHG emissions to maintain global average temperature increase below 1.5°C to 2°C.[68] This key international policy has strengthened the scaling up of action to improve the ability to adapt to adverse impacts of climate change.

National

Legislation

The Climate Change Act 2008 amended in 2019[78], provides the basis for climate action in the UK. It commits the UK to a 100% reduction in GHG emissions by 2050, known as the net zero commitment. In line with the international treaty on climate change, the Paris Agreement, the UK committed to an interim target of a 68% reduction in economy wide GHG emissions by 2030, from 1990 levels.

The Climate Change Act 2008 also commits the UK to adapting to potential impacts of climate change, such as flooding, high temperatures and drought. The Act requires production of five-yearly climate change risk assessments (CCRA) detailing current and predicted impacts of climate change in the UK. The Third CCRA[79] was published in January 2022.

Planning legislation[80,81] establishes a duty on local planning authorities to mitigate and adapt to climate change. The Localism Act 2011[82] brought about radical reform of the planning system, which the Government considers key to securing progress on meeting the UK's climate change targets. At the local level, the Act introduced the NPPF[83] and a new

[75] UNFCC (1998). Kyoto Protocol. Available at: https://unfccc.int/resource/docs/convkp/kpeng.pdf
[76] UNFCC (2015). Paris Agreement. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf
[77] UNFCC (2021). Glasgow Climate Pact. Available at: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf
[78] The Climate Change Act 2008 (2050 Target Amendment) Order 2019 No. 1056. Available at: https://www.legislation.gov.uk/uksi/2019/1056/made
[79] Department for Environment, Food & Rural Affairs (2022). UK Climate Change Risk Assessment 2022. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1047003/climate-change-risk-assessment-2022.pdf
[80] Planning and Compulsory Purchase Act 2004 c. 5. Available at: https://www.legislation.gov.uk/ukpga/2004/5/contents
[81] Planning Act 2008 c. 29. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents
[82] Localism Act 2011 c. 20. Available at: https://www.legislation.gov.uk/ukpga/2011/20/contents/enacted
[83] Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

presumption in favour of sustainable development. Other provisions in the Act enable community action on climate change through the development of NDPs and NDOs, and a 'duty to co-operate' is important for strategic planning of adaptation and mitigation issues with surrounding councils.

National Planning Policy (NPPF)

Revised in July 2021, the NPPF sets out the Government's planning policies for England and how these are expected to be applied. The NPPF is a material consideration in plan-making and development management decisions. The NPPF strongly reinforces the plan-led system as the primary mechanism to deliver sustainable development over the long term, allowing for proper engagement with communities. It highlights the key role of planning in helping to secure radical reductions in GHG emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure.

Paragraph 152 of the NPPF makes clear that climate change is a core planning principle:

> "*The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure*".

The NPPF sets out in paragraph 153 that Local 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 and changes to biodiversity and landscape, and the risk of overheating from rising temperatures".

Paragraph 154 states that: "New developments should be planned for in ways that:

- *a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and*
- *b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards*".

Furthermore, it is stated in paragraph 157, that "local planning authorities should expect new development to:

- *comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and*
- *take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption"*.

The supporting Environment Agency planning practice guidance, flood risk assessments: climate change allowances[84], contains the percentage uplifts for climate change to be added to assessments.

Planning Practice Guidance

The Climate Change Planning Practice Guidance[85] (PPG) advises how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change. Addressing climate change is a core principle of spatial planning and planning also has an important role in delivery of new renewable and low carbon energy infrastructure to facilitate the transition to net zero. The Renewable and Low Carbon Energy PPG[86] provides further guidance on policies for renewable and low carbon energy.

The UK Net Zero Strategy

The UK Net Zero Strategy 2021 sets out a strategy for the UK to reach net zero by 2050. This strategy sets out sectoral policies and proposals for decarbonising all sectors of the UK economy to meet the coming carbon budgets, the Nationally Determined Contribution (NDC) and vision for a decarbonised economy in 2050.[87]

[84] Environment Agency (2016). Flood risk assessments: climate change allowances. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[85] Ministry of Housing, Communities & Local Government (2015). Climate Change. Available at: https://www.gov.uk/guidance/climate-change
[86] Ministry of Housing, Communities & Local Government (2015). Renewable and Low Carbon Energy. Available at: https://www.gov.uk/guidance/renewable-and-low-carbon-energy
[87] Department for Business, Energy & Industrial Strategy (2021). Net Zero Strategy: Build Back Greener. Available at: https://www.gov.uk/government/publications/net-zero-strategy

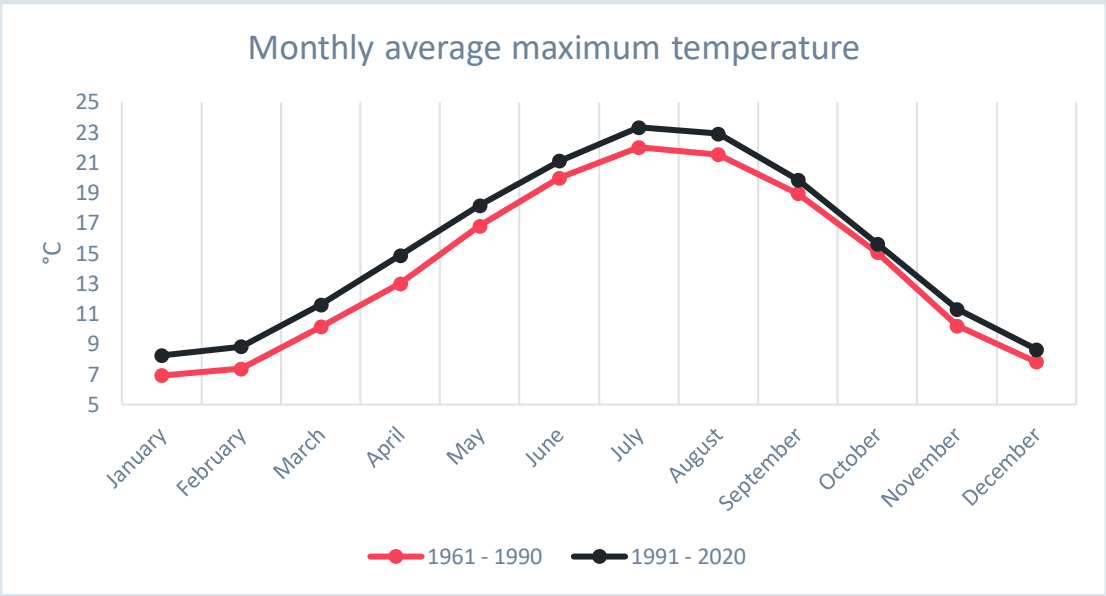
Appendix B Future Climate Change in Woking

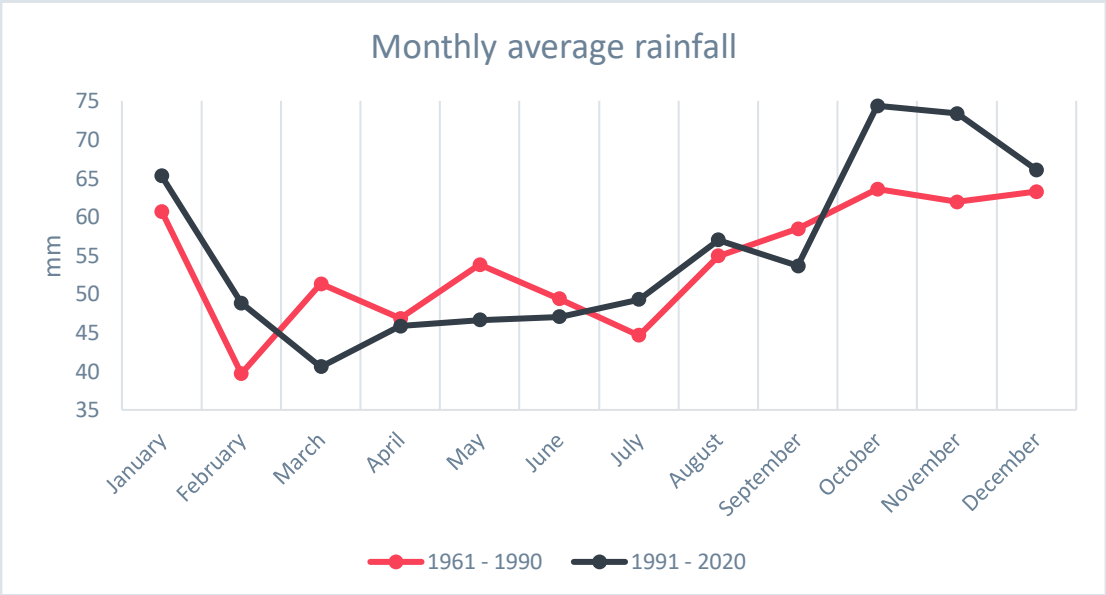
Future Climate Change in Woking

- Woking's current climate is influenced by continental weather bringing cold spells in winter but hot, humid summers.[88] The South of England is also sheltered from weather associated with Atlantic depressions, making it a relatively dry region compared to the rest of the UK, with less seasonal influence. However, there is a trend towards peak rainfall being experienced in autumn / early winter. This is reflected within the meteorological data from climate stations operated by the Met Office; details from the Wisley Climate Station (located approximately 3.5 miles from Woking Town Centre) are provided in **Box 8.1.** The data shows the steady increase in average maximum temperatures, alongside the accentuation of the peak rainfall associated with early winter, coupled with a trend towards drier summers.

[88] Met Office (2016). Regional Climate Summaries. Southern England: climate. (Online). Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/southern-england_-climate---met-office.pdf

Box 8.1 Current climate – Wisley Climate Station[89]

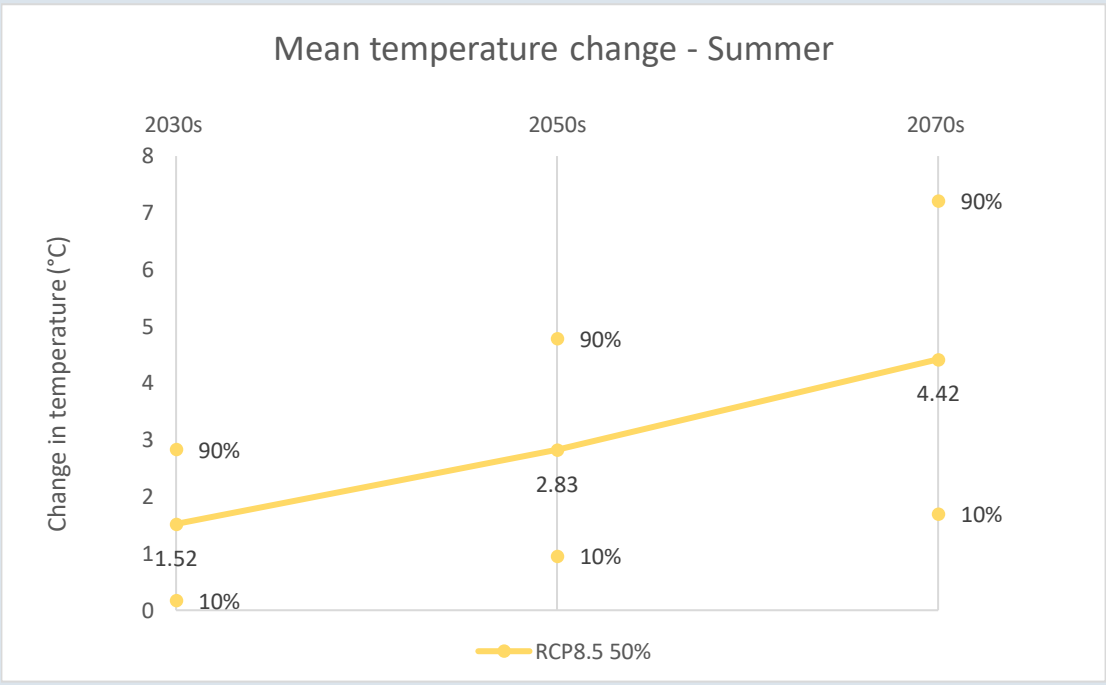




- UK Climate Projection 2018 (UKCP18)[90] data provides a guide as to what future climate trends will likely need to be considered in development planning. UKCP18 produces data for a range of scenarios projecting future GHG emissions, known as representative concentration pathways (RCPs). Each pathway is derived from international projections published in the Intergovernmental Panel on Climate Change's 5th Assessment Report[91].

[89] Met Office (2022). UK Climate Averages – Wisley (online). Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcpevmgzn.
[90] Met Office (2018). UK Climate Projections User Interface. Available at: https://ukclimateprojections-ui.metoffice.gov.uk/ui/home
[91] IPCC (2014). Available at: https://www.ipcc.ch/assessment-report/ar5/ (Accessed December 2022)

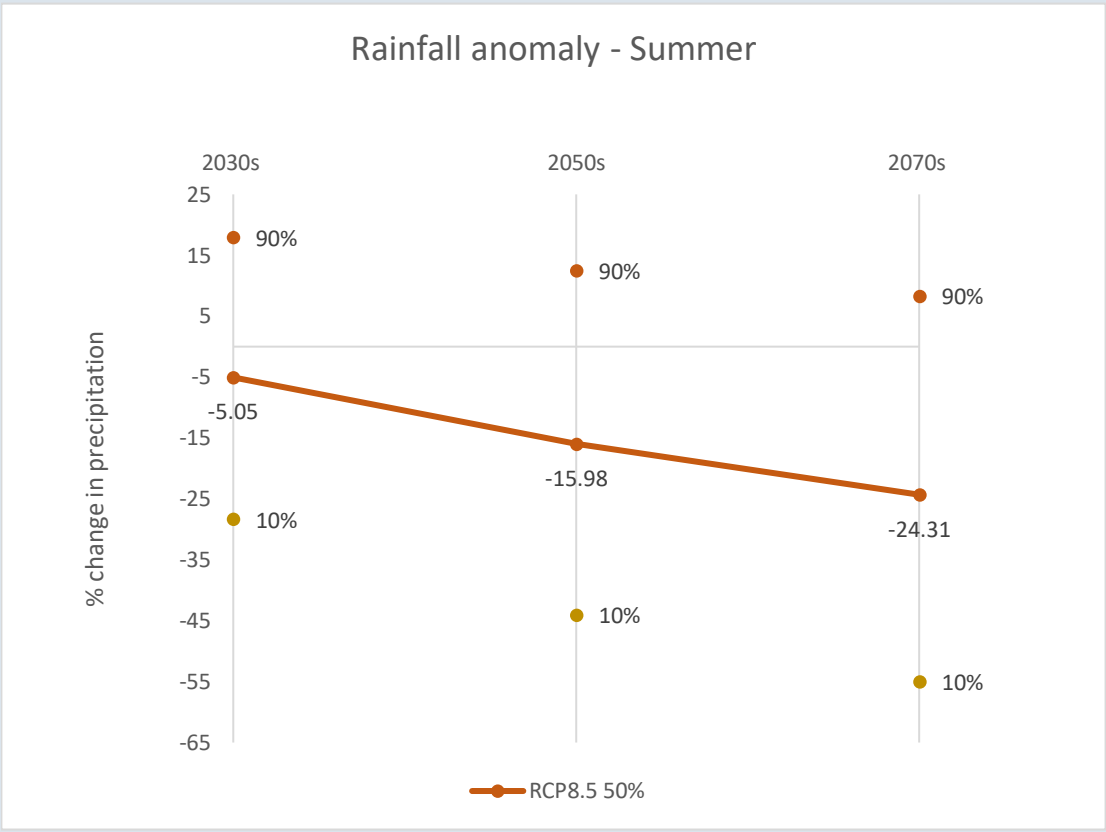
Box 8.2 UKCP18 Future climate – Summer temperature change



- RCP8.5 is considered a high emissions pathway and represents a potential future which is slow to transfer to low-carbon energy provision. With progress towards achieving National Determined Contributions, RCP8.5 is considered a possible, but conservative, emission scenario.
- For the RCP8.5, Woking Borough is projected to experience up to a 7.2°C increase in average summer temperatures by the 2070s (90th percentile or higher range projection), with the 50th percentile (mid-range projection) at 4.4°C (see **Box 8.2**).
- Affinity Water supply the fresh water to the Borough. The region operated by Affinity Water is designated as a region of serious water stress.[92] The Southeast of England is at the highest risk of potential for water scarcity.[93] The Borough is anticipated to experience a decrease in summer rainfall from the current baseline by up to -55% by 2070s under RCP8.5, with a 50th percentile (mid-range) projection of just under a 25% reduction (**Box 8.3**).
- Despite a fall in projected average rainfall, the Southeast is also anticipated to experience a higher intensity of rainfall on the days when it does rain in the summer.[85] This increases the potential for summer flooding events due to extreme rainfall on existing hydrophobic soils.

[92] Affinity Water (2020). Water Resources Management Plan 2020 – 2080. (Online). Available at: https://www.affinitywater.co.uk/docs/Affinity_Water_Final_WRMP19_April_2020.pdf
[93] Sustainability West Midlands (2021). Evidence for the third UK Climate Change Risk Assessment (CCRA3). Summary for England (Online). Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-England-Summary-Final.pdf.

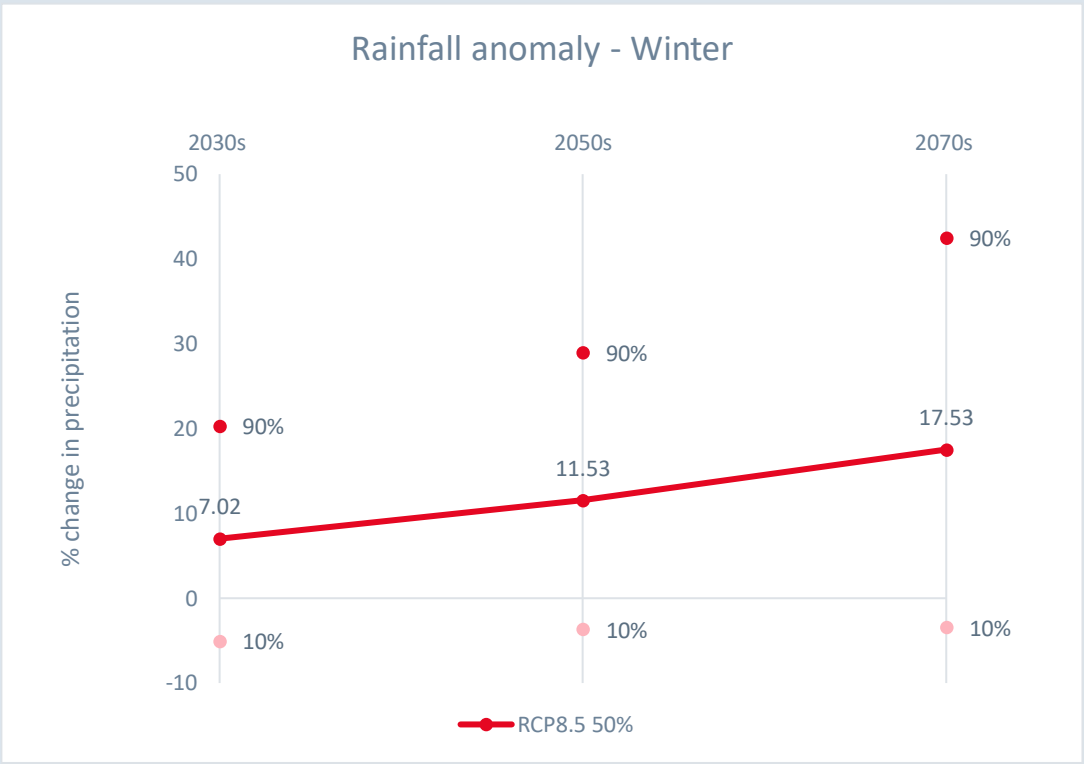
Box 8.3 UKCP18 Future climate – Summer rainfall change



- The Woking Borough Council Strategic Flood Risk Assessment (SFRA) 2015[94] has indicated higher risk of flooding associated with the floodplains of the Wey, Hoe Stream and Whitmoor Common Brook. Surface water flooding has also historically affected the Borough; whereas there are no historic incidents of groundwater flooding. There are existing defences along Hoe Stream associated with the Hoe Stream Flood Alleviation Stream and the Wey Flood Relief Channel.
- Any increase in average rainfall is likely to increase surface water flooding in the urbanised areas of the Borough, due to impermeable surfaces and the current capacity of the drainage network.[86] Future climate change predictions, for instance the increase in winter precipitation change shown in **Box 8.4**, suggest that surface water, sewer and groundwater flooding could become more frequent.

[94] Woking Borough Council (2015). Strategic Flood Risk Assessment Volume 2 Technical Report (Online). Available at: https://www.woking2027.info/ldfresearch/sfra/sfra2015vol2.pdf

Box 8.4 UKCP18 Future climate – Winter rainfall change



- The interaction of the climate change trends requires consideration of a holistic approach to climate change adaptation within the built environment. This means that individual developments can't be built in isolation from their surrounding environment. Instead, design work relating to overheating and flood resilience needs to integrate and complement existing areas. This will improve the overall climate resilience of our communities.
- A further important aspect of adaptation measures is the use of Nature-based Solutions (NBS).[95] These are defined as "actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits". In a local context, this means diversifying land use so as to integrate larger areas of natural vegetation ('green infrastructure') and water ('blue infrastructure') within our urban environment. These are explored in more detail in **Section 7.2.**

[95] International Union for Conservation of Nature and Natural Resources (2020). Global Standard for Nature-based Solutions (Online). Available at: https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf

Appendix C Sustainable Construction Checklist – Residential Development

This checklist is to be read in conjunction with the Council's Climate Change Supplementary Planning Document, which gives detailed guidance on the implementation of policies CS22 'Sustainable construction', and CS23 'Renewable and low carbon energy generation' of the Core Strategy. The checklist forms the basis of Sustainability Statements (which should be submitted for major development proposals). For mixed-use developments, please complete both checklists.

Application Site Address

1. Location & Transport **Aim:** reduce the need to travel and distance travelled; increase the proportion of travel by sustainable modes such as walking, cycling, public transport and lower carbon vehicles; and reduce climate change vulnerability by locating development away from areas liable to flooding.	**Yes**	**No**	**N/a**
Have you considered including measures to reduce dependence on private car-borne transport and influence a shift to more sustainable modes such as walking, cycling, and the use of public transport?			
Does the proposal provide appropriate levels and standards of Electric Vehicle parking?			
Does the proposal provide appropriate levels of cycle parking?			
Is it feasible to include provision for Car Clubs in the proposal?			
Have you submitted a Travel Statement (for smaller-scale developments) or Travel Plan (for proposals that generate significant traffic) with your proposal?			
Does the location of the proposed development minimise distances to the main employment centres, shops, recreation and community facilities and schools?			

Have you ensured the development is located away from an area liable to flooding, and is not dependent on transport links (roads, footpaths etc.) liable to flooding?			

2. Layout & Design **Aim:** reduce energy demands for heating and cooling; build in resilience to the impacts of climate change such as flooding and heat through good layout and design.	**Yes**	**No**	**N/a**
Does the proposed site layout maximise the potential for passive solar gain?			
Have you considered how buildings could be designed to maximise the capture and use of passive solar energy?			
Have you considered designing in measures to prevent excess solar gain in summer?			
Have you designed the layout to use landform and landscape to benefit from shelter?			
Have you considered the potential for passive cooling and ventilation in summer?			
Have you considered how existing and proposed trees and shrubs could be used to provide shade for private and public open space?			
Has the development been designed to maximise natural lighting, incorporate private (and potentially public) amenity space, and ensure the building is adaptable to allow scope for changes to be made to meet the needs of the occupier?			

3. Energy and carbon reduction **Aim:** reduce the need for energy, use energy efficiently, supply energy efficiently and use renewable or low or zero carbon technologies.	**Yes**	**No**	**N/a**
Has the development been designed to optimise the use of the energy from the sun and limit heat losses?			
Has the development been designed to optimise natural daylight, energy efficient lighting, external lighting and natural ventilation?			
Does the development meet the energy efficiency requirements of the interim uplift in Part L of the Building Regulations (or Full Future Homes Standard from 2025)? Is this clearly illustrated?			
Will the design of the building make efficient use of energy? (e.g. use of thermally passive materials, levels of insulation, energy efficient white goods and use of green / brown roofs etc.).			

Will guidance for the non-technical building user be provided so they can understand and operate the building efficiently and understand how the design reduced the overall environmental impact of the building and raise environmental awareness?			
Has local energy generation from renewables and/or decentralised energy been considered as part of the scheme?			
Have you checked whether your proposed development falls within a zone requiring proposals to assess the feasibility of connecting to a decentralised heat network or be designed to be 'heat network ready'?			

4. Water & Drainage **Aim:** incorporate measures to ensure development is resilient to increased risk of flooding or droughts; reduce water demand and increase more efficient use of water as periods of drought increase.	**Yes**	**No**	**N/a**
Does the development incorporate the use of water saving devices to achieve the higher water efficiency standard under Regulation 36(3) of the Building Regulations?			
Have you considered incorporating rainwater recycling and harvesting systems?			
Have you considered incorporating recycling and harvesting facilities for grey water?			
Where a site-specific flood risk assessment is required, have climate change allowances[96] been used?			
Have you considered designing in measures to minimise surface water run-off e.g. minimising paved areas and impermeable surfaces?			
Have you considered incorporating sustainable urban drainage (SuDS) into your development proposal?[97]			
Have you considered how any SuDS techniques used will achieve wider ecosystem functions (e.g. contribution to amenity, recreation, wildlife etc.)?			
Have you defined maintenance responsibilities for any proposed SuDS?			

5. Waste & Materials	**Yes**	**No**	**N/a**

[96] Further guidance is available at: www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[97] From 6 April 2015 all 'major' planning applications must consider sustainable drainage systems – see the Council's Advice Note.

Aim: facilitate the reduction, recycling and reuse of waste and provide opportunities to improve materials resource efficiency.			
Have you considered how the design of the development can facilitate the reduction of waste and the recycling and composting of waste generated by occupants?			
Will the development make the maximum use of construction and demolition waste?			
Will the development make maximum use of re-used and recycled materials?			
Have you considered using locally and/or responsibly sourced building materials?			
Does the proposal encourage the use of re-used, recycled, recyclable and durable products e.g. salvage material or re-using/recycling demolition materials for hardcore and aggregate?			
Will selected materials ensure a low environment impact long-term – has embodied energy been considered?			

6. Green Infrastructure & Ecology **Aim:** to retain, protect and enhance wildlife habitats and green infrastructure features to adapt the built environment to climate change impacts.	**Yes**	**No**	**N/a**
Does the proposal include the provision of green and blue spaces (e.g. parks, gardens, green corridors, water bodies and sustainable drainage systems etc.)?			
Have you considered how green and blue spaces within the development will connect to the wider green infrastructure network?			
If the development involves the loss of any open space, is alternative and equivalent or better provision made elsewhere, or is the development directly related to the enhancement of the open space?			
Will the proposal avoid any loss of trees, hedgerows and other vegetation of amenity and/or environmental significance?			
Have the wildlife habitats and natural features on and adjacent to the site been appraised or assessed at an early stage in the project?			
Have you considered adopting measures to conserve, enhance and/or restore biodiversity in and around the development?			

Will you be protecting existing ecological features from damage during site preparation and completion of construction works where practicable?			
Does the proposal provide for on-going management of green and blue spaces, including biodiversity habitats?			

Sustainable Construction Checklist – Non-Residential Development

This checklist is to be read in conjunction with the Council's Climate Change Supplementary Planning Document, which gives detailed guidance on the implementation of policies CS22 'Sustainable construction', and CS23 'Renewable and low carbon energy generation' of the Core Strategy. The questions are intended to help provide pointers as to the type of considerations that the development should be taking into account in order to achieve BREEAM standards and form the basis of Sustainability Statements (which should be submitted for major development proposals). For mixed-use developments, please complete both checklists.

Application Site Address

1. Location & Transport **Aim:** reduce the need to travel and distance travelled; increase the proportion of travel by sustainable modes such as walking, cycling, public transport and lower carbon vehicles; and reduce climate change vulnerability by locating development away from areas liable to flooding.	**Yes**	**No**	**N/a**
Have you considered including measures to reduce dependence on private car-borne transport and influence a shift to more sustainable modes such as walking, cycling, and the use of public transport?			
Have public transport networks been considered in terms of the location of the development and proximity to local amenities?			
Does the proposal provide appropriate levels and standards of Electric Vehicle parking?			
Does the proposal provide appropriate levels of cycle parking?			
Is it feasible to include provision for Car Clubs in the proposal?			
Have you submitted a Travel Statement (for smaller-scale developments) or Travel Plan (for proposals that generate significant traffic) with your proposal?			

Have you ensured the development is located away from an area liable to flooding, and is not dependent on transport links (roads, footpaths etc.) liable to flooding?			

2. Layout & Design **Aim:** reduce energy demands for heating and cooling; build in resilience to the impacts of climate change such as flooding and heat through good layout and design.	**Yes**	**No**	**N/a**
Does the proposed site layout maximise the potential for passive solar gain?			
Have you considered how the building could be designed to maximise the capture and use of passive solar energy?			
Have you considered designing in measures to prevent excess solar gain in summer?			
Have you designed the layout to use landform and landscape to benefit from shelter?			
Have you considered the potential for passive cooling and ventilation in summer?			
Have you considered how existing and proposed trees and shrubs could be used to provide shade for public open space?			
Has the development been designed to ensure users have sufficient daylight, an external view, adequate and appropriate lighting, ventilation, air quality and drinking water?			

3. Energy and carbon reduction **Aim:** reduce the need for energy, use energy efficiently, supply energy efficiently and use renewable or low or zero carbon technologies.	**Yes**	**No**	**N/a**
Has the building been designed to minimise CO^2 emissions associated with their operational energy consumption?			
Has the development been designed to optimise the use of the energy from the sun, natural daylighting and controlled natural ventilation?			
Does the development meet the energy efficiency requirements of the interim uplift in Part L of the Building Regulations (or Full Future Buildings Standard from 2025)? Is this clearly illustrated?			
Will the design of the building make efficient use of energy? (e.g. use of thermally passive materials, levels of insulation, energy efficient white goods and use of green / brown roofs etc.).			

Have renewable energy sources or decentralised energy been considered for the development?			
Have you checked whether your proposed development falls within a zone requiring proposals to assess the feasibility of connecting to a decentralised heat network or be designed to be 'heat network ready'?			

4. Water & Drainage **Aim:** incorporate measures to ensure development is resilient to increased risk of flooding or droughts; reduce water demand and increase more efficient use of water as periods of drought increase.	**Yes**	**No**	**N/a**
Does the development incorporate the use of water saving devices to achieve the high standards of water efficiency?			
Have you considered incorporating harvesting and re-use of rainwater?			
Does the development meet the requirements of CS9: *Flooding and water management*?			
Where a site-specific flood risk assessment is required, have climate change allowances[98] been used?			
Have you considered designing in measures to minimise surface water run-off e.g. minimising paved areas and impermeable surfaces?			
Have you considered incorporating sustainable urban drainage (SuDS) into your development proposal?[99]			
Have you considered how any SuDS techniques used will achieve wider ecosystem functions (e.g. contribution to amenity, recreation, wildlife etc.)?			
Have you defined maintenance responsibilities for any proposed SuDS?			

5. Waste & Materials **Aim:** facilitate the reduction, recycling and reuse of waste and provide opportunities to improve materials resource efficiency.	**Yes**	**No**	**N/a**

[98] Further guidance is available at: www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[99] From 6 April 2015 all 'major' planning applications must consider sustainable drainage systems – see the Council's Advice Note.

Will selected materials ensure a low environment impact long-term – has embodied energy been considered?			
Have you considered reusing materials in-situ, responsibly sourcing materials and re-using existing structures?			
Has an audit of the materials present on the site been conducted with an assessment of the extent to which materials could be re-used?			
Will development make maximum use of construction, demolition waste and recycled materials?			
Have you considered how the design of the development can facilitate the reduction of waste and make provision for the storage and recycling of waste for all users of the site/building?			

6. Green Infrastructure & Ecology **Aim:** to retain, protect and enhance wildlife habitats and green infrastructure features to adapt the built environment to climate change impacts.	**Yes**	**No**	**N/a**
Have opportunities to enhance the provision of green and blue infrastructure been identified?			
Will the proposal avoid any loss of trees, hedgerows and other vegetation of amenity and/or environmental significance?			
Have the wildlife habitats and natural features on and adjacent to the site been appraised or assessed at an early stage in the project?			
Have you considered adopting measures to conserve, enhance and/or restore biodiversity in and around the development?			
Will you be protecting existing ecological features from damage during site preparation and completion of construction works where practicable?			
Does the proposal provide for on-going management of green and blue spaces, including biodiversity habitats?			