4 Sustainable Enfield

INTRODUCTION

4.1 The 2018 Inter-governmental Panel on Climate Change report has served as a timely reminder of the imperative need for climate change across all levels of governance. Climate change poses severe and enduring social, economic and environmental implications. It is essential to recognise that climate change is inherently linked to issues of social justice. Enfield's geographical layout means that more deprived communities are affected by rising flood risks, and the instabilities associated with a changing climate are expected to disproportionally affect those with limited resources to effectively respond.

4.2 In 2019, Enfield Council made a commitment to address climate emergency by pledging to become a carbon neutral organisation by 2030. Subsequently, in 2020, the Council adopted the Climate Action Plan, setting the ambition for Enfield to be a carbon neutral organisation by 2040. To realise this vision, this chapter outlines the requirements for addressing the energy implications of new developments, reducing waste, and supporting effective adaptation to a changing climate.

4.3 While this chapter's policies emphasise fundamental aspects of sustainability and the transition to net zero carbon development, it is vital to acknowledge that the broader policy framework throughout this plan is equally essential in achieving a sustainable future for Enfield. This includes policies related to sustainable transportation, compact mixed-use neighbourhoods, the public realm and blue and green infrastructure enhancements. Taken together, this policy framework is crucial to creating sustainable places to face the challenges of the twenty first century.

Firs Farm Entrance

STRATEGIC POLICY

SE1: RESPONDING TO THE CLIMATE EMERGENCY

The Council will work with partners to:

1. use all planning tools available to meet the 2040 net zero carbon Borough commitments set out in the Climate Action Plan[10];
2. encourage both established and innovative approaches to tackling climate change, reducing air pollution, managing flood risk and promoting sustainable infrastructure;
3. require high-quality net zero carbon development which maximises fabric efficiency standards and on-site renewable energy generation;
4. prioritise heat decarbonisation, with no new gas connections, ensuring all heating and hot water in proposed development to be provided through low carbon sources;
5. ensure development proposals support and contribute towards the expansion and decarbonisation of the Borough's existing heat network and maximises the deployment of renewable energy;
6. ensure development is designed for resilience in a changing climate, including supporting future adaptability and mitigate the risk of overheating (for example through considering the orientation of buildings and using trees for shading);
7. reduce all sources of flood risk (including through the use of Sustainable Drainage Systems), improve wastewater infrastructure in line with the Council's Infrastructure Delivery Plan;
8. require developments to embed design and operation that is aligned with sustainable waste management in operation, the minimisation of waste and the uplift of recycling targets;
9. embed a circular economy approach to building design and construction to reduce waste, support reuse and minimise embodied carbon, prioritising retrofit first.
10. build on Policies T1, T2 and T3
11. safeguard the role of the natural environment as a biodiverse resource and as a carbon sink;
12. maximise the role of the natural environment in delivering measures to reduce the effects of climate change, including tree planting to moderate heat island effects. Green Infrastructure and resilient ecological networks will play an important role in aiding climate change adaptation; and
13. ensure the character and significance of built and natural heritage is safeguarded whilst maximising opportunities to improve energy efficiency and introduce new energy sources.

[10] https://new.enfield.gov.uk/services/environment/enfield-climate-action-plan-2020-environment.pdf

EXPLANATION

4.4 This overarching policy seeks to ensure that all new developments including both residential and non-residential developments actively contribute to reducing carbon emissions. Enfield's Climate Action Plan[11] sets out the Borough's strategic and coordinated approach towards addressing climate change.

4.5 The ELP plays an important role in helping the Borough in responding to the climate emergency. It provides the planning framework for mitigating and adapting to climate change with regard to how land is used and managed within Enfield. To achieve this objective and foster energy efficient development, specific carbon reduction targets have been defined, aligning with the energy hierarchy outlined in the London Plan.

[11] https://new.enfield.gov.uk/services/environment/enfield-climate-action-plan-2020-environment.pdf

Prince of Wales Wetlands

DEVELOPMENT MANAGEMENT POLICY

SE2: SUSTAINABLE DESIGN AND CONSTRUCTION

1. All development, including new developments, change of use, conversions and refurbishments, will be required to submit a sustainable design and construction statement. The statement should set out how sustainable design principles have been integrated into a design-led approach; including the consideration of the construction and operational phases of development; and how proposed interventions have been balanced against other constraints, for example heritage significance. The statement should be proportionate to the nature and scale of development proposed with a sufficient level of detail to demonstrate that the relevant policy requirements have been satisfied.
2. Major residential development of ten or more dwellings are required to work towards achieving Home Quality Mark (HQM) 4.5* with a minimum certification level of 4*.
3. Non-residential development with a combined gross floorspace of 1,000 square metres floorspace or more must work towards achieving Building Research Establishment Environmental Assessment Method (BREEAM) 'outstanding' with a minimum certification level of 'excellent'.

EXPLANATION

4.6 This policy outlines our approach for ensuring that sustainable design and construction principles inform new development. Part 1 of the policy relates to all new developments and requires a proportionate sustainable design and construction statement as part of planning applications. For major developments the sustainable design and construction statement should refer and complement other detailed statements including:

- energy usage, operational and whole-life carbon emissions and reporting, as set out in the energy strategy (see policies SE4, SE5 and SE7);
- landscape design and urban greening which should demonstrate an integrated approach to both hard and soft landscape design which maximises urban greening, soft landscaping and sustainable drainage measures;
- air quality considerations, as set out in the air quality impact assessment (see policy ENV1);
- integrated water management and sustainable drainage, see policy SE9;
- waste reduction, adaptive reuse and whole-life carbon emissions, as set out in the circular economy statement (see policy SE3); and
- site and building level measures to mitigate overheating and enable passive and cross ventilation.

4.7 Minor developments should include proportionate information on the key aspects mentioned above. This information could be incorporated within a design and access statement. Part 2 of the policy relates to major residential developments and outlines aspirations and minimum requirements using the HQM assessment framework. Part 3 relates to non-domestic development and sets aspirations and minimum requirements using the BREEAM assessment framework. In cases where alternative assessment frameworks have been approved by the local planning authority, developments may have the option to utilise them.

4.8 The metrics, targets and standards set out in following policies (SE3, SE4 and SE5) should inform and, if necessary, take precedence over the HQM and BREEAM standards set out here.

DEVELOPMENT MANAGEMENT POLICY

SE3: WHOLE-LIFE CARBON AND CIRCULAR ECONOMY

1. All major development proposals will be required to meet objectives set out below through the provision of a circular economy statement. Proposals should prioritise reuse and retrofit of existing buildings wherever possible before considering the dismantling of old buildings and the design of new buildings and minimise environmental impact of materials by reusing materials on-site where possible. Any circular economy statement should meet the criteria set out in London Plan Policy SI7 part B or its subsequent update.

2. Major development proposals are required to calculate whole-life cycle carbon emissions through a nationally recognised whole life cycle carbon assessment, in line with London Plan Policy SI 2, or its subsequent update and associated guidance. Developments should demonstrate actions taken to reduce life-cycle carbon emissions with the aim of achieving the targets set out in **table 4.1**, or higher future standards set by national or regional policy.

Table 4.1: Upfront carbon requirements, in accordance with the latest RICS Whole Life Carbon Assessment Methodology (Modules A1-5)

	PLANNING APPLICATIONS BEFORE 1ST JANUARY 2030	PLANNING APPLICATIONS AFTER 1ST JANUARY 2030
Domestic	<500 $kgCO_2e/m^2$	<300 $kgCO_2e/m^2$
Non-Domestic	<600 $kgCO_2e/m^2$	<350 $kgCO_2e/m^2$

EXPLANATION

4.9 Up to a fifth of carbon emissions associated with UK building stock comes from embodied emissions associated with new builds. Embodied emissions are defined in paragraph 9.2.11 of the London Plan. Even as buildings become more energy efficient, significant emissions are associated with embodied carbon – this source can represent 40-70% of whole life carbon emissions of a low carbon building[12].

4.10 To address this challenge and reduce whole life cycle carbon emissions, this policy seeks to ensure that new development addresses core circular economy principles in a circular economy statement (Part 1).

4.11 The Circular Economy Statement could include a materials audit, reviewing the materials which can be salvaged and reused on site. Enfield Council has established the Excess Materials Exchange, a means connecting unwanted materials with recipient projects to prevent valuable resources being discarded as waste.

4.12 As part of the Circular Economy Statement, developers are encouraged to provide a Circular Index calculation.

[12] LETI (2020) Climate Emergency Design Guide

This is a percentage from 0 to 100 where 100% represents retention of all materials, and 0% represents the use of completely new materials. In the case of demolition, 0% would represent all materials disposed or incinerated. We encourage developers to reach a Circular Index of 50% or above, and scores below 50% require additional justification as part of the Statement.

4.13 The Circular Index (%) is calculated as:

Circular Index (%) = ((kg of new materials x 0.1) + (kg of renewable materials x 0.6) + (kg of recycled materials x 0.6) + (kg of reused materials x 0.8) + (kg of materials kept in situ x 1.0))/Total kg of materials.

4.14 In line with London Plan Policy, Part 2 requires major developments calculate whole life-cycle carbon emissions. Applicants should evidence how they have taken actions with the aim of meeting the targets set out in Table 4.1 of the policy.

4.15 The targets used derive from LETI (2020) Climate Emergency Design Guide.

4.16 Key considerations for understanding the opportunities for retrofitting and reuse include:

- Is a new building necessary to meet the client's brief? If yes, why? Detail space, layout or other requirements vs the existing building configuration
- Has the brief been interrogated against the client's needs, and does it represent the most efficient solution?
- What is the condition of the existing building? Could it be repaired or reused without being demolished?
- Does retention allow the heritage significance of a site or building – or its contribution to local character and distinctiveness – to be preserved and enhanced?
- Can uses be shared or spaces be multi-functional?
- Are there options for the building to be re-configured or adapted in ways which conserve and reuse the most existing embodied carbon?
- Internal reconfiguration
  - Upwards or out-wards extension
  - Strip back to structural core and reuse
  - Reuse foundations

DEVELOPMENT MANAGEMENT POLICY

SE4: REDUCING ENERGY DEMAND AND INCREASING LOW CARBON ENERGY SUPPLY

1. All relevant developments (those resulting in the creation of one or more dwellings or 500sqm or more non-residential GIA, including new build, change of use, conversions and major refurbishments) are required to:

   a. install low carbon heating and hot water, there should be no on-site combustion of fossil fuels for heating. New developments should not be connected to the gas grid, except for in exceptional circumstances.

   b. provide an energy statement demonstrating how emissions savings have been maximised on site at each stage of the energy hierarchy.

   c. achieve carbon reduction, as far as possible on-site meeting minimum reductions as set out in parts 2 and 3, or London Plan or subsequent national policy, whichever is higher.

2. All relevant developments (those resulting in the creation of one or more dwellings or 500 sq.m. or more non-residential gross internal area (GIA), including new build, change of use, conversions and major refurbishments) should maximise energy efficiency, in alignment with 'Be Lean' stage of the energy hierarchy and demonstrate a space heating demand of 15 kWh/m2/yr. or less.

3. All relevant developments (those resulting in the creation of one or more dwellings or 500sqm or more non-residential GIA, including new build, change of use, conversions and major refurbishments) should achieve an Energy Use Intensity (EUI) not exceeding the targets out set in **Table 4.2**:

Table 4.2: Operational energy use targets

Domestic buildings[13]	35 kWh/m^{2}GIA/yr
Industrial buildings and warehouses	35 kWh/m^{2}GIA/yr
Schools	65 kWh/m^{2}GIA/yr
Offices, Retail, HE teaching facilities, GP surgeries	70 kWh/m^{2}GIA/yr
Hotels	160 kWh/m^{2}GIA/yr

4. Developments that demonstrate meeting Passivhaus equivalent certification, or subsequent replacement systems, will have demonstrated compliance with this policy.

5. All developments (resulting in the creation of one or more dwellings or 500 sq.m. or more non-residential gross internal area (GIA), including new build, change of use, conversions and major refurbishments) should aim to achieve net zero energy balance. To reach this objective, developments will be expected to install on-site renewable energy equating to a minimum of 80kWh/m2, based on the building footprint (and 120kWh/m2 for industrial buildings), be met unless it can be clearly demonstrated that this is not practically viable, e.g. on a heavily over shaded site; where this would result in an unacceptable adverse impact upon a heritage asset or its setting; or where there are conflicting spatial limitations. Roof space should be optimised to deliver PVs, Air Source Heat Pumps, and/ or green roofs.

[13] Including student or keyworker accommodation, care homes or extra care homes

6. All major residential developments of ten or more dwellings and non-residential development of 500sqm GIA or more will be net-zero carbon. In instances where it can be clearly demonstrated that no further savings can be achieved on-site, due to site constraints or limitations (for example, heritage constraints):

   a. Off-site provision to meet any shortfall is acceptable provided that an alternative proposal is identified, and delivery is certain.

   b. If neither on-site or off-site options are feasible then a cash in lieu contribution to meet net zero carbon at a rate of £1.32/kWh may prove acceptable

7. Major developments (resulting in the creation of ten or more dwellings or 1,000sqm or more non-residential GIA, including new build, change of use, conversions and major refurbishments) are required evaluate the operational energy use using realistic information on the intended use, occupancy, and operation of the building to minimise any performance gap. They shall demonstrate this through compliance with the above targets using a design for performance methodology such as Passivhaus PHPP[14] or CIBSE[15] TM54 Operational Energy or any updating successors.

8. All major developments[16] shall monitor and report on energy use for five years after occupation.

9. Any new energy centres should prioritise non-combustible, non- fossil fuel energy as the primary heat source. Temporary fossil-fuel primary heat sources must only be installed for a maximum of five years prior to connection to an approved low carbon heat source and interim emissions should be reflected in energy statements and subsequent calculations and offset payments.

10. Development proposals will be expected to address a site's energy infrastructure requirements, as identified in the Infrastructure Delivery Plan and provide any necessary infrastructure upgrades as required to support the development proposal. Developments should seek to connect to a decentralised energy network where the operator is willing to extend. All such developments shall comply with the Enfield Decentralised Energy Networks Supplementary Planning Document and any updating successor.

11. If connection to a decentralised energy network is not possible, large-scale major developments proposals (200 or more dwellings or 10,000sqm or more non-residential) will be expected to consider the integration of new energy networks in the development, with consideration for future connection to the Borough's heat networks. This consideration shall form part of the development proposals and take into account the site's characteristics and the existing cooling, heat and power demands on adjacent sites where readily available.

12. All major proposals should consider opportunities to incorporate demand response and energy storage technologies.

[14] Passive House Planning Package

[15] Chartered Institution of Building Services Engineers

[16] As defined in Annex 2 of the NPPF

EXPLANATION

4.17 Net-zero carbon is defined as when the amount of carbon emissions associated with the building's operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and is powered by renewable energy sources whether they are on-site and/or off-site, with any remaining carbon balance being offset.

4.18 To effectively address the carbon emissions of buildings it is important to minimise energy consumption during building operation. Energy consumption should be evidenced through the provision of an energy statement. Part 2 of the policy aims to reduce space heating demand, while part 3 focuses on reducing operational energy use.

4.19 The Delivering Net Zero report (Etude et al, 2023) defines Energy Use Intensity (EUI) as 'the total energy needed to run a home over a year (per square metre). It is a measure of the total energy consumption of the building (kWh/m2/yr). The EUI of a building covers all energy uses: space heating, domestic hot water, ventilation, lighting, cooking and appliances.'

4.20 The 'UK Housing: fit for the future' report (2019) by the Committee on Climate Change highlights the imperative to build new homes to ultra-high energy efficiency standards. The report recommends a space heating demand standard of 15-20 kWh/m2/yr, which has informed the 15 kWh/m2/yr requirement set out in Part 2 of the policy.

4.21 The standards outlined Part 3 of the policy relate to gross internal area (GIA), and excludes the contribution made by renewable energy sources.

4.22 The most up to date carbon factors must be adopted for all carbon assessments. Operational energy emissions must reported in a standardised format, following the GLA's Energy Assessment Guidance and supporting carbon emissions reporting spreadsheet, or its subsequent updates or replacements. Part 5 of this policy indicates that renewable energy generation should be incorporated on site for all new developments. The amount of energy generated in a year should match or exceed the predicted annual energy demand of the building. When this is not technically possible and suitably justified, the applicant should pay into the Council's New Development Carbon Contribution Fund a sum of money equivalent to this shortfall. Based on the current average price and performance of a PV system, and with the addition of a 10% project management fee, an offset price of £1.32/kWh is required by part 6 of the policy. If off-site provision is considered (in line with London Plan Policy SI2 part C2) the 'alternative proposal' should be located within Enfield. In assessing development proposals, there may be legitimate trade-offs between the use of limited roof-space for renewable energy generation to get to a net zero operational balance, and other policy requirements around climate adaptation, for instance for green roofs to provide habitat, reduce runoff and mitigate overheating. In these instances, flexibility is encouraged and decisions should be made on a case-by-case basis. Where there are conflicts between photovoltaic systems (PVs) and green roofs, decision makers are encouraged to give preference to the latter approach.

4.23 The 'performance gap' in building performance, which is the difference between anticipated energy use and actual performance, is an issue of concern. Parts 7 and 8 of this policy seeks to ensure the reporting of accurate information to inform future policy development, with the goal of closing the performance gap. Part 8 requires major developments to monitor and report their energy usage in line with London Plan paragraph 9.2.10.

4.24 Part 10 of the policy actively encourages the expansion of decentralised energy throughout the Borough. Achieving carbon-neutral development cannot entirely be achieved through building efficiency alone, hence the adoption of zero and low carbon energy generation methods is supported, including connections to decentralised energy networks. Decentralised energy networks have been identified as the cost optimal solution to decarbonising heat in Enfield, aligning with national policy direction such as the DESNZ on Heat Network Zoning, and regional policy direction as outlined in London Plan Policy SI3. At the local level, the Enfield Decentralised Energy Networks Supplementary Planning Document (SPD) supports decentralised energy networks and is further evidenced by the recently completed Local Area Energy Plan (LEAP). Identified heat network priority areas can be reviewed through the London Heat Map https://maps.london.gov.uk/heatmap/

4.25 Connection to an existing or future decentralised energy network may can be secured via a legal agreement as part of the planning application. The Enfield Decentralised Energy Network SPD or its subsequent update) provides more detailed technical design guidance relevant to commercial and residential developments, requiring them to connect to or contribute towards decentralised energy networks. Where appropriate, we will work with infrastructure providers to facilitate the provision of infrastructure (including the safeguarding of routes and sites) to support new and expanding decentralised energy networks. In autumn 2021, BEIS initiated consultations on proposals for the implementation of heat network zones. The aim of the project is to develop heat networks in zones where they can provide the lowest cost low carbon heat to the end-consumer through regulation, mandating powers, and market support. Enfield has been selected as a pilot for the heat network zones project and may inform subsequent policy in respect to heat networks.

4.26 Enfield's ability to achieve Net Zero will ultimately depend on the decarbonisation of electricity consumed within the Borough, thereby replacing the direct use of fossil fuels for transportation and heating. The decarbonisation of Enfield's electricity use will be largely dependent on the rate of decarbonisation of the whole electricity system in Great Britain. Scenarios produced by the National Grid and Committee on Climate change set out possible trajectories for the decarbonisation of the grid. Enfield's has adopted a decarbonisation pathway in line with the National Grid's 'consumer Transformation' scenario. Zero carbon grid electricity is achieved in the early 2030s, slightly ahead of the UK Government's 2035 target.

4.27 If the grid is to decarbonise, and Enfield is to achieve its net zero target, then opportunities for increasing locally-generated power need to be exploited to a much greater extent than they currently are. Based on the most recent available data, around 0.003% of Enfield's electricity demand was matched by renewable generation within its own boundary in 2020. Given the largely urban nature of the Borough, scope for developing large-scale renewable energy projects is relatively limited rooftop solar PV considered to have the greatest potential within the borough. This is supported by Part 5 of the policy.

4.28 The demand for power is expected to increase across the Borough as part of the transition towards achieving a decarbonised future. This will require a need to effectively manage both demand and supply of power. Flexible solutions such as battery technology or smart charging, involves shifting charge events to period when there is a lower overall demand on the electricity system, or higher levels of renewable energy generation. Such measures can help ease the total power demand on the electricity network, potentially avoiding the need for costly upgrades to network infrastructure and offering electricity consumers the potential for lower cost energy. These types of technologies support the shift towards electrification, which is required to decarbonise the Borough.

DEVELOPMENT MANAGEMENT POLICY

SE5: RENEWABLE ENERGY DEVELOPMENT

1. In determining planning applications for renewable and low carbon energy, and associated infrastructure, the following issues will be considered:

a. the contribution of the proposals to cutting greenhouse gas emissions and decarbonising our energy system.

b. local amenity, including appropriate stand-off distances between technologies (e.g. wind turbines) and sensitive uses;

c. impacts, including cumulative impacts on the built and natural environment, having regard to its proximity to sensitive receptors (including designated and non-designated heritage assets, high quality landscapes such as river valleys, reservoirs and regional parks, parts of the urban fringe and strategic views from the Green Belt, areas of special character and areas of Metropolitan Open Land);

d. suitable mitigation measures to minimise, offset and overcome any adverse impacts;

e. scope to reclaim the land to a suitable and safe condition and use (e.g. agriculture or nature conservation) once it ceases to operate; and

f. direct benefits to the area and local community. Particular support will be given to renewable and low carbon energy generation developments that are led by or meet the needs of local communities.

EXPLANATION

4.29 This policy actively promotes the generation of renewable energy. Generating renewable energy plays a crucial role in helping to decarbonise the electricity supply, a key element in achieving carbon neutral development. The effectiveness of energy efficiency policies in the ELP can only take us so far.

4.30 According to the Committee on Climate Change (2023), their proposed pathway towards achieving a decarbonised energy system envisages that 70% of the country's energy is supplied by renewable sources by 2035[17]. Establishing a positive framework for the development of renewable energy is essential to support the process of decarbonising the energy system.

4.31 The primary goal of this policy is to ensure that potential negative impacts can be avoided or effectively mitigated, so that the scope for renewable energy to meet Enfield's needs can be optimised.

4.32 Furthermore, this policy encourages the integration of renewable energy generation with other forms of development, such as the installation of solar photovoltaics (PVs) over car parks.

[17] Committee on Climate Change (2023) 'Delivering a reliable decarbonised power system,' page 53

DEVELOPMENT MANAGEMENT POLICY

SE6: CLIMATE CHANGE ADAPTATION AND MANAGING HEAT RISK

1. Developments will be required to:

   a. provide adequate mitigation measures to minimise overheating including landscaping, tree planting and the use of blue-green infrastructure; and

   b. optimise the layout, orientation, materials, technology and design of buildings and spaces to minimise any adverse impacts on internal and external temperature, reflection, overshadowing, micro-climate and wind movement.

2. Major developments must undertake overheating assessments in line with the cooling hierarchy set out in the London Plan (or any successor plan) taking account of future climate change. Developments are required to undertake a detailed analysis of the risk of overheating and submit evidence as outlined as set out in GLA's Energy Assessment Guidance or its subsequent update.

   a. Applicants will be expected to demonstrate how passive measures have been optimised from the outset to reduce overheating risk (e.g. form, orientation, glazing ratio).

   b. External and passive shading will be expected to form part of major proposals – and should be demonstrated to be considered for the purpose of meeting overheating standards prior to active or user-reliant systems being proposed (e.g. boost ventilation, internal blinds or active cooling).

   c. All modelling shall also be assessed against 2050 local weather files in addition to the current version of local data and extreme scenarios.

   d. The energy statement should include a description for considerations for future resilience including opportunities for adaptation.

EXPLANATION

4.33 Climate change is expected to increase the severity and frequency of extreme heat events in the Borough. The escalating concern regarding heat risk is becoming an increasingly important issue, particularly in the context of a growing population and the effects of global climate change. This policy requires all new developments to be designed to effectively manage heat risk, address internal and external temperatures and improve human comfort.

4.34 Under this policy, development proposals should address the cooling hierarchy outlined in the London Plan to mitigate overheating and avoid reliance on air conditioning systems. The cooling hierarchy includes a range of measures such as passive ventilation, active low-carbon cooling systems, mechanical ventilation, energy efficient design, higher ceilings, shading, and green infrastructure, all of which contribute to reducing internal temperatures. The use of blue-green infrastructure and urban greening as sustainable cooling options for both internal and external environments is strongly encouraged.

4.35 To properly assess risks of overheating, applicants should refer to the latest Chartered Institution of Building Services Engineers (CIBSE) guidance on assessing and mitigating the risk of overheating in new developments, which includes TM59 for domestic development and TM52 for non-domestic development. It is also essential to reference the Mayor of London's Energy Planning Guidance or its subsequent updates.

4.36 Severe hot weather conditions can discourage outdoor activities and physical engagement. Consequently, developments are expected to be designed in a way that promotes a comfortable environment, with shaded areas integrated into the public realm and indoor amenity spaces designed to be cool and well-ventilated. If necessary, contributions to cooling measures for spaces and streets beyond the development's boundaries may be appropriate. This could, for example, enhance the comfort and appeal of the public realm for walking and cycling in line with the healthy streets approach set out in the London Plan.

4.37 All major development proposals will be required to submit an energy statement, clearly outlining how measures at the higher end of the cooling hierarchy have been prioritised and considered into the design-led approach. Proposals that use measures at the lower levels of the hierarchy will be resisted, unless there is evidence to demonstrate that this is necessary, for example, for reasons due to technical feasibility.

4.38 Recognising that the feasibility of measures should be commensurate with the nature and scale of development, it is acknowledged that minor developments, particularly householder extensions, may have limited opportunities to implement certain measures from the upper tiers. Nevertheless, developers should investigate potential measures and incorporate these wherever possible. The cumulative beneficial impacts of smaller developments can help mitigate the urban heat island effect. Therefore, the loss of established soft landscape features without replacement will be resisted in all cases and the introduction of new soft landscaping will be encouraged, wherever possible.

Firs Farm pond dipping

DEVELOPMENT MANAGEMENT POLICY

SE7: MANAGING FLOOD RISK

1. New development must avoid and reduce the risk of flooding and not increase flood risk elsewhere. New development must:

   a. assess the risk of flooding from all sources including fluvial, surface water, groundwater, sewer and reservoir as identified in the Strategic Flood Risk Assessment (SFRA) or any subsequent reviews/updates of the evidence base on flooding;

   b. be appropriate according to its flood risk vulnerability classification (as defined in the Technical Guidance to the National Planning Policy Framework);

   c. be designed to be safe for a 1% annual exceedance probability (AEP) event with the appropriate allowance of climate change; and

   d. be appropriately located (according to the sequential test) and informed by a site-specific Flood Risk Assessment (FRA).

2. Site-specific groundwater flood risk assessments will be required for proposals at risk of groundwater and / or include below ground elements.

3. Development proposals (including change of use) that require a site-specific Flood Risk Assessment (FRA) should be prepared in accordance with the latest SFRA. In addition, groundwater flood risk assessment may be required where basement level development is proposed. Feasibility of the development should ensure that all opportunities to avoid and reduce flood risk are identified and maximised; this should include early engagement with the Lead Local Flood Authority (LLFA).

4. All new development at risk of flooding must:

   a. preserve overland flood and flow routes, where applicable;

   b. ensure no net loss of flood storage on site for both fluvial and surface water flood risk, or in exceptional circumstances, provide adequate offsite compensatory storage;

   c. demonstrate that it will be safe throughout its lifetime, taking into account the vulnerability of its users, which includes the provision of flood warning arrangements and evacuation plans;

   d. maintain or provide new or upgraded flood infrastructure at a sufficient standard of protection and/or provide a financial contribution towards measures which reduce and mitigate against flood risk;

   e. incorporate flood resilient and flood resistant design measures where there is residual risk;

   f. apply appropriate construction techniques to limit potential disturbance to natural groundwater flows (for example, where basements or deep strip foundations are proposed), such as the use of drainage measures or piled foundations;

   g. where the development is for essential infrastructure, the measures must ensure that the site is designed to remain operational when floods occur;

   h. manage surface water as part of all development to minimise run-off through sustainable drainage systems; and

   i. prevent the loss of permeable surfaces/ areas of soft landscaping and maximise the use of blue-green infrastructure as potential sources of flood storage.

5. Where applicable, evidence must be provided so that we can ensure requirements of the sequential test of sites across the Borough has been met and, where an exception test is required, demonstrate that:

   a. the development would provide wider sustainability benefits to the community that outweigh flood risk;

   b. the development is on developable previously developed land or, if this not the case, that there are no reasonable alternative sites on developable previously-developed land; and

   c. the development will be safe without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

6. Developments that are subject to or result in unacceptable levels of flood risk on site or increase flood risk to third parties will not be permitted due to being deemed unsafe. This includes changes of use (to more vulnerable uses), householder developments (such as extensions, basements and retaining walls) and redevelopment of brownfield sites. In some cases, permitted development rights may be removed as described in the SFRA. Proposals will be refused which provide an unacceptable standard of safety.

7. Developments in proximity to culverts and watercourses should have a minimum of 8 metre set back (unless otherwise agreed with the Environment Agency, LLFA, Thames Water and the Canal and River Trust) with a means to facilitate river naturalisation, ecological enhancements and de-culverting, which improves maintenance of land drainage, enhances local amenity and improves the ecological function of river corridors. If less than 8 metres is proposed, this must be robustly justified and evidenced.

8. Development must assess, protect and improve groundwater quality, particularly where it occurs within an inner source protection zone (as shown on the Policies Map) or on sites where historic contamination is likely to present a significant risk to groundwater.

EXPLANATION

4.39 The number of properties at risk of flooding is high compared to most other local authorities across the country, due to the large network of watercourses in Enfield, which form a key part of its landscape. These watercourses drain from the western part of the Borough to the River Lee that flows down the eastern part of the Borough, which was historically an area of marshland. The underlying pattern of geology and the effects of urbanisation mean that Enfield is susceptible to fluvial, surface water and groundwater flooding. Careful consideration of site specifics (exact development usage and vulnerability classification), engagement with stakeholders, flood risk studies and potential mitigation measures are all methods which may allow development. Although groundwater flooding is considered to be low relative to fluvial and surface water flooding, large parts of the Borough experience localised groundwater flooding, which can be exacerbated by the development of basement levels. Therefore, groundwater flood risk assessments will be required where basement levels are proposed, as set out in the SFRA.

4.40 Enfield's drainage infrastructure consists of separate surface water and foul water drainage systems and as well as large open watercourses and drainage ditches. Most surface water outfalls into the nearest watercourse. Consequently, a range of flood risk solutions are required to manage flooding from all types of sources and ensure Enfield's residents and workers are not faced with unacceptable risks of disruption.

4.41 New development should be located appropriately to avoid risks of flooding from all sources as directed by the SFRA and NPPF. The policy criteria above will also ensure developments reduce the causes of flooding.

4.42 All developments, including change of use, must prepare a site-specific Flood Risk Assessment (FRA) in line with the guidance set out in the SFRA. In some cases, developments in flood zone 1 may be subject to the 1-in-100 year plus climate change flood extent. Assessing flood risk should also include the potential for blockages in culverts and overland flow routes.

4.43 Applying the sequential test and exception tests is crucial in directing development to areas with lower risk, unless there is a clear justification for an alternative higher risk location. Development in areas subject to flood risk will only be acceptable provided the development is safe throughout its lifetime, provides wider sustainability benefits that outweigh flood risk, and no reasonable alternative sites on developable land exists. Where climate change is expected to increase flood risk in developed land, relocation opportunities must be sought, in line with the NPPF.

4.44 If the sequential test shows no suitable alternative sites in lower flood risk areas, and development is required, the most vulnerable elements of a development should be located in the lowest risk parts of the site.

4.45 To be classed as 'safe', the development must adhere to the following criteria:

- It should provide a dry access route above the flood level representing 100-year plus climate change scenario or, where appropriate modelled data exists, an access route within the "very low hazard" floodplain area[18] to and from any residential development; and
- Finished floor levels should be elevated at least 300mm (for fluvial flooding) or 150mm (for surface water flooding) above the flood level associated with a 1% Annual Exceedance Probability (AEP) plus climate change event. This should be achieved without increasing flood risk elsewhere, with the condition there is no net loss of flood storage and overland flow routes remain unobstructed. Consequently, basement levels will not be permitted in areas subject to fluvial and surface water flood risk.

4.46 Flood resilience is a design measure that reduces the damage to buildings from flooding. Examples of flood resilient design measures include raising electrical circuits and other services and using appropriate floor and wall coverings. Flood resistance measures aim to prevent flood waters from entering properties, including the installation of flood-proof air brick covers, closed cell insulation and non-return valves for drainage systems.

[18] Environment Agency's Flood Risk Assessment Guidance for New Development R&D Technical Report FD2320)

Volunteer planting at Pymmes Park Wetlands

4.47 The flood mitigation measures employed must have to regard to any specific measures identified in SFRA (at levels 1 and 2), the Local Flood Risk Management Strategy, and the Infrastructure Delivery Plan, taking into account any capacity-related issues.

4.48 In some cases, developments may be located in sensitive catchment areas or may remain exposed to residual flood risk. In these cases, a financial contribution will be required to support offsite flood mitigation measures, in line with the Infrastructure Delivery Plan and SFRA.

4.49 Development proposals must provide a sustainable drainage strategy as required by policy DM SE9, to demonstrate that the development will not increase flood risk. In some cases, it may not be possible to meet the criteria for safe development. This may be considered acceptable, as an exception to the normal rules, for developments involving changes of use in existing buildings where no viable alternatives are available. In this situation, an evacuation plan must be prepared to demonstrate the following:

- A safe access route in the "very low hazard" area of the floodplain (as defined by FD2320) will be available no longer than 24 hours after the onset of the flooding for a 1 in 100-year plus climate change event.
- An access route within the "danger for some" or "danger for most" floodplain area (as defined by FD2320) is available to and from the development.
- Appropriate flood resistance and resilience measures have been employed.
- A safe, dry refuge area is available at all times (for example, if the ground floor is classified as unsafe, the refuge area should be located on an upper floor).

Pocket Park at Haselbury Road

DEVELOPMENT MANAGEMENT POLICY

SE8: PROTECTION AND IMPROVEMENT OF WATERCOURSES

1. Development adjacent to, or within close proximity to the Borough's network of watercourses will be expected to:

a. be adequately set back from the watercourse (open or culverted) to allow for maintenance, river restoration and habitat enhancement. The distance applied will be determined having regard to the nature of the development and the type of watercourse subject to further consultation with the LLFA, Environment Agency, Thames Water and the Canals & River Trust;

b. not involve the culverting or loss of any watercourse;

c. not adversely affect any waterway infrastructure, which could result in increased flood risk, land instability and/or inhibit navigation;

d. involve the de-culverting of a watercourse where it is deemed appropriate from consultation with the LLFA; and

e. enhance the ecological, flood risk, water quality aesthetic and amenity quality of the watercourse and apply the objectives of the Thames River Basin Management Plan.

2. Development on or adjacent to watercourses must not:

a. result in deterioration in a watercourse; or

b. prevent its ability to achieve the objectives in the Thames River Basin Management Plan.

c. Where possible, it should also implement the mitigation measures identified in Thames River Basin Management Plan.

d. Have an adverse impact upon the amenity value of the watercourse, including its character and heritage significance

3. Development on any land required for current and future flood management, which would adversely affect the delivery of flood defence schemes, will be refused

4. Where a Water Framework Directive assessment is required to undertake some works on or adjacent to a watercourse, the developer will need to contact the Environment Agency and provide evidence to demonstrate that the above requirements can be met or to otherwise justify the development.

EXPLANATION

4.50 The failure of flood defences could have severe consequences and pose a risk to life and property. Therefore, the protection of these assets is imperative. Consequently, new developments should maintain a set back from defences and watercourses to ensure that there is adequate space and accessibility for future maintenance. Development should also be set back from watercourses to preserve their settings, prevent the overloading of banks and to minimise the risks to the development.

4.51 Failure of flood risk management infrastructure, such as raised defences and culverts, can lead to rapid inundation of the areas protected by these defences, yielding unexpected and catastrophic results. It is preferable to adopt more sustainable practices, including the restoration of river corridors that provide more space for rivers to flow and flood naturally, adopting a catchment based approach.

4.52 The naturalisation of watercourses releases the potential for additional waterflow and flood storage capacity while simultaneously providing amenity and biodiversity value. Developers should explore opportunities for the de-culverting of existing watercourses, with a general presumption against further culverting.

DEVELOPMENT MANAGEMENT POLICY

SE9: SUSTAINABLE DRAINAGE SYSTEMS

1. A Sustainable Drainage Strategy will be required for all major developments or those where the inclusion of Sustainable Drainage Systems are necessary to demonstrate how the proposed measures manage surface water as close to its source as possible and follow the drainage hierarchy in the London Plan. All developments must maximise the use of and, where possible, retrofit Sustainable Drainage Systems (SuDS) which meet the following requirements:

Suitability

2. SuDS measures should be appropriate having regard to the proposed use of site, site conditions/context (including proximity to Source Protection Zones and potential for contamination) and geology. In accordance with SuDS good practice guidance[19], developments must aim to maximise source control SuDS measures.

Quantity

3. All major developments must achieve greenfield run off rates (for 1-in-1 year and 1-in-100-year events with the allowance of climate change or achieve Qbar if one control is employed).

4. All other development should achieve as close to greenfield run off rates as possible and must maximise the use of SuDS, including source control SuDS measures resulting in net improvement in water quantity and quality.

5. For developments discharging directly to watercourses, greenfield runoff rates will not always be the optimal solution in terms of managing flood risk at catchment scale. An appropriate discharge rate must be agreed with the LLFA. Achieving greenfield runoff rates for lower order events (e.g. the 1-in-2 year event) can ensure water quality and other benefits are still achieved.

Quality

6. All developments must have regard to best practice and follow the SuDS management train by providing a number of treatment phases corresponding to their pollution potential and the environmental sensitivities of the locality. As part of the SuDS management train, source control SuDS measures such as rain gardens, green roofs, permeable surfacing etc. must be utilised across the whole site to capture the first 5mm of rainfall to minimise the mobilisation of silts and contaminants.

7. Measures should be incorporated to maximise opportunities for sustainable development, improve water quality, biodiversity, local amenity and recreation value.

Functionality

8. The system must be designed to allow for flows that exceed the design capacity to be stored on site or conveyed off-site with minimum impact. Clear ownership, management and maintenance arrangements must be established.

Other

9. Where appropriate, developments must incorporate relevant measures identified in the Local Flood Risk Management Strategy[20].

10. The criteria above must be demonstrated through the submission of a SuDS strategy at full planning application stage.

11. Developments must consider SuDS provision in the earliest phases of the design process as the SuDS strategy affects the layout of the development and has a direct effect on landscaping, urban greening and biodiversity.

[19] https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/update-to-the-suds-manual

[20] https://new.enfield.gov.uk/services/environment/flooding-information-local-flood-risk-management-strategy-2016.pdf

EXPLANATION

4.53 Effective surface water management plays a vital role in reducing the risks associated with flooding, pollution and other forms of environmental damage.

4.54 Given that every part of the Borough either falls within an area at risk of flooding or is located upstream of such area, any form of development has the potential to increase the risk of flooding further downstream in the catchment. Even minor developments, such as changes in land use or modifications to individual properties, contribute significantly to the overall runoff characteristics within a given catchment when their cumulative effects are considered. Consequently, all developments must maximise the use of Sustainable Drainage Systems (SuDS), including previously developed sites.

4.55 Sustainable Drainage Strategy will be required for all major developments, as well as some other forms of developments. The Council has developed two SuDS proformas which are designed to assist developers in identifying the necessary SuDS measures based on the scale of development. Additionally, all developments must make every effort to retain and enhance permeable surfaces, flood storage and flow routes to mitigate possible increases in flood risk elsewhere. SuDS should be provided on site so that they are managed as part of that development in accordance with the drainage hierarchy set out in the London Plan.

4.56 The selection of SuDS measures must be appropriate to the site and the nature of the proposed development and/or operations. Factors such as local geology, sensitive groundwater supply areas (e.g. Source Protection Zones) and the pollution potential associated with certain uses may constrain the ability of a site to rely on full infiltration. However, this should not deter the implementation of SuDS. It is possible to design solutions that capture the key benefits of SuDS, namely flood risk management and pollution mitigation, for any type of development, regardless of ground conditions. This can be through the use of measures such as impermeable liners where required. Developers must use information on local conditions, including the SFRA, SWMP, LFRMS, and information held by other organisations to inform/justify their selection of SuDS measures. Developers should also note the potential need for an Environmental Permit for discharging surface water run-off and are encouraged to undertake pre-application engagement with the relevant bodies and organisations[22].

Table 4.3: Sustainable drainage system - proformas

Minor	• Householder developments (e.g. extensions, crossovers, minor outbuildings, change of uses) • Minor developments up to one unit, or with a footprint of less than 250m^2
other	• Minor developments two units of more, or with a footprint of 250m^2 or more[21] • All major developments

4.57 SuDS policies at the national, regional and local levels encourage the multiple benefits offered by green infrastructure. These benefits include water quality improvement, biodiversity enhancement, amenity provision, air quality improvement, noise pollution reduction, and mitigation of the urban heat island effect. Such benefits contribute not only to public health and wellbeing but also to environmental enhancements. To facilitate effective delivery, efficient use of available space, and maximise the overall benefits, SuDS should seamlessly be integrated into landscaping schemes. Almost all landscaped features have the potential for above ground storage. Well-

[21] In cases where developments of 2 or more units are likely to have a significant impact on surface water drainage, the more detailed proforma should be utilised

[22] Further guidance on environmental permits can be found at: https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits

designed SuDS can also contribute to a development's fulfilment of the London Plan's urban greening factor and open space requirements.

4.58 To maximise SuDS performance, it is important to follow the principles of a SuDS management train. This term describes a series of SuDS components used in sequence to treat, store and control runoff. Source control SuDS measures such as rain gardens, green roofs and permeable paving, form part of the "treatment" component of the management train and should be utilised for the majority of the hardstanding and roof runoff produced on-site. These features should be designed to capture the first 5mm of rainfall and improve the water quality of the runoff generated on-site. "Pipe-to-pond" solutions where runoff is directed straight into a storage feature without passing through a source control measure should be avoided, as this often results in polluted and silted storage features which pose management problems. This also means that source control SuDS measures should be utilised upstream of proprietary treatment measures (e.g. petrol interceptors) as part of the treatment component of the SuDS management train. Depending on the pollution potential and environmental sensitivities of the site, some developments may require a series of treatment components. Effective maintenance of SuDS is essential, and keeping SuDS above ground can simplify maintenance issues. Examples of above ground SuDS features include basins, ponds, green roofs, permeable surfaces, water butts and swales. When such features are maintained above ground, any problems that do arise are generally obvious and can be remedied using standard landscaping practices.

4.59 Situations may arise where an offsite contribution towards SuDS measures and flood alleviation will be required, particularly where developments fail to achieve policy requirements or are located in sensitive catchments.

4.60 SuDS designs should be in accordance with best practice guidance, such as the SuDS Manual, DEFRA's Non-Statutory technical standards and Enfield's Design and Evaluation Guide[23].

[23] Further guidance on drainage strategies can be found on our website at https://new.enfield.gov.uk/services/planning/sustainable-drainage-systems/ along with the SuDS proformas for minor and major developments.

Glenbrook SuDS