

Sustainability and Energy Statement

Land to the North of The Drove Way, Istead Rise,
Gravesham

May 2026



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1. Introduction

This Sustainability and Energy Statement has been prepared to demonstrate the sustainability strategy for the development proposals at Land to the North of The Drove Way, Istead Rise, Gravesham.

1.1 Introduction

This Sustainability and Energy Statement has been prepared by Turley Sustainability & ESG, on behalf of Ptarmigan Land A Ltd (the 'Applicant'), to support an outline planning application to Gravesham Borough Council for a residential development of up to 100 homes at Land to the North of The Drove Way, Istead Rise, Gravesham.

It demonstrates the range of positive measures that are incorporated into the development proposals to ensure high levels of environmental sustainability performance in accordance with national and local policy objectives.

1.2 Site Context

The Site is currently undeveloped agricultural land. The Site is bound to the north by open countryside, to the south by The Drove Way and existing residential properties within Istead Rise, and to the east and west by existing residential properties.

1.3 Proposed Development

The description of development proposed is:

"Development for up to 100 residential dwellings (Class C3), including the formation of new accesses from The Drove Way, the provision of new areas of public open space and all other associated infrastructure and ancillary works (all detailed matters reserved other than means of access)."

Figure 1 overleaf shows the illustrative masterplan of the proposed development.

1.4 Document Structure

Chapter 2 of this report provides an overview of relevant national and local legislation, planning policy and guidance.

Chapter 3 provides detail of the sustainability and energy strategy of the proposed development, in line with the local planning policy.

Chapter 4 provides an overall summary of the report and sustainability benefits delivered.

Please note, the terms "carbon", carbon dioxide (CO₂)" and "greenhouse gas (GHG)" are used interchangeably in this statement depending on the terminology of referenced documents.

2. Policy Context

This chapter provides an overview of the relevant sustainability planning policy and guidance from a national and local perspective.

2.1 National Policy and Guidance

This section sets out a summary of current national guidance and policy in relation to sustainable development.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹ provides a framework for the development of locally prepared plans and the government's planning policies for England and how these are expected to be applied.

Paragraph 8 outlines the environmental objective of the Framework which includes mitigating and adapting to climate change and moving to a low carbon economy.

Paragraph 161 similarly confirms that the planning system should support the transition to net zero by 2050 in a changing climate, including providing support to proposals which contribute to radical reductions in greenhouse gas emissions and encourage the reuse of existing resources, as well as the development of low carbon energy.

Paragraph 163 confirms that the need to mitigate and adapt to climate change should be considered in preparing and assessing planning applications,

taking into account the full range of potential climate change impacts.

Paragraph 164 expects new development to be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change, ensuring that suitable adaptation measures are provided where development is located in a vulnerable area.

Paragraph 166 of the Framework states that new development should:

- Comply with adopted Local 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.

Paragraph 167 states that LPAs should prioritise supporting energy efficiency and low-carbon heating improvements, such as installing heat pumps and solar panels, for both domestic and non-domestic buildings.

The NPPF recognises the role planning can play in support of the UK's pursuit of the United Nations Sustainable Development Goals (UNSDGs) which address social progress, economic wellbeing and environmental protection².

¹ [UK Government | NPPF](#)

² [UN Sustainable Development Goals](#)

Figure 2: Example UN Sustainable Development Goals



2.1.2 Planning Practice Guidance

Planning Practice Guidance (PPG) provides further advice on various planning issues associated with development, including those linked to sustainability and renewable energy and underpins the policies within the NPPF.

PPG is a material consideration in planning decisions and should generally be followed unless there are clear reasons not to. It sets out how local authorities should include policies that protect the local environment and strategies to mitigate and adapt to climate change and supports developments that are functional and adaptable for the future.

2.1.3 National Design Guide

The National Design Guide published in October 2019 and is based on the national planning policy practice guidance and objective for good design as set out in the NPPF. The Guide introduces ten characteristics of well-designed places which work together to create developments Character and Community, while positively addressing environmental issues affecting climate.

2.1.4 Building Regulations

Building Regulations set out the requirements for energy and carbon performance in new buildings. Periodic updates to these national regulations drive energy efficiency and carbon reduction improvements.

Part L, Conservation of Fuel and Power - The Future Homes Standard (FHS), an update of Part L, was confirmed on the 24th of March, with the following implementation dates:

- 24th March 2027 for non-high-risk building work, and

- 24th September 2027 for high-risk building work in England.

The evolving standard aims to deliver higher-quality homes with lower energy bills and reduced carbon emissions. For new homes, the FHS sets out requirements to be 'zero-carbon ready', meaning that they will require no retrofitting to achieve zero carbon emissions once the electricity grid fully decarbonises.

While developers retain flexibility in how they meet carbon reduction targets, key mandatory changes under the standard include:

- Low-carbon heating i.e. heat pumps.
- Solar PV covering a minimum area equivalent to 40% of the building's foundation footprint, with some exemptions.
- Other low-carbon technologies, such as wastewater heat recovery for homes.
- Airtightness targets of approximately 4 m³/m²/hr @ 50 Pa for new homes.

The FHS is expected to ensure new buildings align with the UK Government's legal commitment to achieving net zero emissions by 2050.

Part S, Infrastructure for Charging Electric Vehicles - Approved document Part S came into force in June 2022 and sets out requirements for the provision of electric vehicle (EV) charging infrastructure. EV charge points must be provided for each new residential building with associated parking, and any remaining spaces must have cable routes for charge points to be installed.

Part O, Overheating - Approved document Part O came into force in June 2022, and sets out requirements for mitigating overheating from rising summer temperatures in residential developments. Compliance with Part O can be demonstrated using two methods, either following a simplified prescribed glazing and free area ratio, or use of Dynamic Simulation Modelling.

2.1.5 Environment Act

The Environment Act aims to protect the environment through improving air and water

quality, protecting wildlife, and ensuring the sustainable management of waste. As of February 2024, The Environment Act requires new development to deliver at least 10% Biodiversity Net Gain (BNG), as measured by the statutory biodiversity metric.

2.2 Local Planning Policy

Relevant Gravesham Borough Council planning policy is summarised below.

2.2.1 Gravesham Local Plan Core Strategy (2014)

The Local Plan Core Strategy³ is the main document in the Gravesham Local Plan. It sets out a long-term vision for the future of Gravesham supporting sustainable development within the borough.

The Core Strategy sets out the following relevant sustainability policies.

Policy CS01: Sustainable Development – States that the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF and in this Core Strategy.

Policy CS11: Transport - Requires new developments to mitigate their impact on the highway and public transport networks. A transport assessments and travel plans should be provided and implemented to ensure the delivery of travel choice and sustainable opportunities for travel.

Policy CS12: Green Infrastructure – States that a multifunctional linked network of green spaces, footpaths, cycle routes and wildlife stepping stones and corridors will be created, protected, enhanced and maintained.

Policy CS13: Green Space, Sport and Recreation – States the Council will seek to make adequate provision for and to protect and enhance the quantity, quality and accessibility of green space, playing pitches and other sports facilities.

Policy CS14: Housing Type and Size – States the Council will expect new housing development to

provide a range of dwelling types and sizes taking into account the existing character of the area and evidence of local need to create sustainable and balanced communities.

Policy CS15: Housing Density – States that all new housing will be developed at a density that is consistent with achieving good design and does not compromise the distinctive character of the area.

Policy CS16: Affordable Housing – States that provision of affordable housing will be required on all new housing developments of 15 dwellings or more, with the threshold of 30% in the urban area and 35% in the rural area.

Policy CS18: Climate Change – Sets out the following requirements:

- **Flood risk** - Proposals in areas at risk of flooding must be accompanied by a Flood Risk Assessment and a Flood Risk Management Plan, where necessary, to demonstrate that they are adequately defended and safe over their lifetime.
- **Sustainable Drainage and Surface Water Run-Off** - surface water run-off from all new development should have no greater adverse impact than the existing use, and Sustainable Drainage Systems (SuDS) should be implemented.
- **Water Demand Management** – requires all new homes to achieve a water use target of 105 litres per person per day consumption.
- **Carbon Reduction** - requires major development to include proposals for low carbon and renewable energy generation.

Policy CS19: Development and Design Principles – requires the design and construction of new development to incorporate sustainable construction standards and techniques, be adaptable to reflect changing lifestyles, and be resilient to the effects of climate change, through the following measures:

- The design and layout of new development should take advantage of opportunities to build

³ [Local Plan 2014](#)

in resilience to the effects of climate change. This will include protection against flood risk, where relevant, delivering carbon reduction, provision for low carbon and renewable energy, and minimising energy consumption and water use.

- Incorporation of appropriate facilities for the storage and recycling of waste.
- Encouraging sustainable travel.
- Inclusion of appropriate hard and soft landscaping.
- Protection and enhancement of biodiversity and the Borough's Green Infrastructure network.

2.2.2 Design for Gravesham - Design Code (SPD)

The Design for Gravesham – Design Code (SPD) (May 2024)⁴ is a supplementary planning document produced by Gravesham Borough Council. It offers guidance to support the implementation of policies outlined in the Gravesham Local Plan Core Strategy (2014), with specific focus on **Policy CS19 Development and Design principles**, including **Energy efficiency and resilience design principles**:

- Applicants must demonstrate they have maximised energy efficiency of their proposals by using aspect, orientation and design elements to help reduce heating and lighting needs.
- Developments must adopt a “fabric first” approach to reduce their energy demand before integrating renewable alternatives.
- Proposals should introduce low and zero carbon decentralised energy generation infrastructure where viable.
- Applicants must consider the effects of climate change specifying robust landscape, materials and infrastructure that can help the building future climate adaptation, thereby making development climate resilient.

- Applicants should demonstrate they have maximised water efficiency of their proposals through water efficient infrastructure, harvesting of rainwater and re-use of grey water in line with current Building Regulations.
- Applicants should demonstrate they have integrated or considered the sustainability of the construction process and off-site construction methods.

2.2.3 Validation Checklist

The Council's validation checklist⁵ requires that a an Energy / Sustainability Assessment is provided demonstrating:

- How the proposed development will, both pre & post construction address energy and water consumption, reduce transport impacts and use of sustainably sourced materials.
- How the proposed building will reduce the CO₂ emissions of the entire scheme.
- How waste collection and recycling facilities will be provided. Larger scale major developments (50 plus homes) should demonstrate that the relevant waste collecting authority has been consulted on the final form of facilities proposed.

2.2.4 DRAFT Gravesham Local Plan 2042

The Proposed Submission Version of the Gravesham Local Plan 2042⁶ (Regulation 19) was published on 17th April 2026. The key sustainability policies are summarised below:

Policy LP 9: Climate Change – requires all development to be of sustainable design and enable sustainable construction, operation, and occupation, taking into full account all climate impacts, including overheating, drought, water scarcity, and flood risks. New residential development should maximise energy efficiency through a 'Fabric First' approach, including high-quality insulation and low-energy ventilation, and incorporate on-site renewable energy generation

⁴ [Design for Gravesham SPD](#)

⁵ [Validation checklist](#)

⁶ [Emerging Local Plan 2042](#)

(such as Solar PV) to reduce reliance on the grid.

Policy LP 11: Achieving High-Quality Design, Sustainability & Place Making – requires the following:

- **Net Zero by Design:** Achieve net zero for operational energy and incorporate measures to reduce whole life carbon emissions. This must include embedding sustainable construction, maximising fabric efficiency, and enabling the use of renewable energy generation.
- **Water Management and Adaptation:** Incorporate water efficiency measures, SuDS and robust mitigation for flood risk.
- **Water quality:** Not pose an unacceptable risk or harm to the water environment.
- **Environmental pollution.** Avoid adverse environmental impacts from pollution, including noise, air, odour and light pollution, and land contamination.
- **Biodiversity and Green Infrastructure:** Enhance the public realm and landscape character by conserving and enhancing existing green and blue infrastructure, connecting and improving ecological networks and delivering measurable Biodiversity Net Gain (BNG).

2.3 Planning Policy Summary

Both local and national policy aim to ensure the delivery of sustainable and well-designed buildings which mitigate and adapt to the impacts of climate change.

The Gravesham Local Plan Core Strategy and Design for Gravesham SPD set out requirements for sustainable new development to maximised energy efficiency through adaptation of a “fabric first” approach and on-site renewable and low carbon energy generation, maximise water efficiency, incorporate climate change resilience measures, enable sustainable travel and maximise waste recycling. Consideration of the construction process sustainability and off-site construction methods is also required.

In this context the following sections of this Sustainability and Energy Statement set out the measures incorporated at this stage and to be considered as part of the detailed design of the development to ensure the delivery of a sustainable development and addressing the requirements of local and national policies.

3. Sustainability and Energy Strategy

This section summarises the sustainability strategy for the proposed development at Land to the North of The Drove Way, Istead Rise, Gravesham.

This section of the report outlines the sustainability and energy strategy for the proposed development, demonstrating how the development responds to both national and local planning policy, including the NPPF.

In this context the sustainable design commitments are set out under the following headings which reflect the themes of the NPPF.

Building a Strong and Competitive Economy – Demonstrating the developments social and economic benefits.

Promoting Sustainable Transport – Setting out how the development aims to enhance sustainable transport.

Promoting Healthy Communities – Including details of how the development will promote health and wellbeing.

Meeting the Challenge of Climate Change – Demonstrating how the development will deliver low carbon housing which is resilient to the effects of climate change.

Conserving and Enhancing the Natural Environment – Setting out how the development will protect and enhance the natural environment and minimise potential pollution impacts.

Sustainable Resources – Setting out how the development will reduce construction waste and

put in place measures to reuse and recycle waste through construction and operation, helping minimise the use of resources.

3.1 Building a Strong and Competitive Economy

The proposed development will contribute to positive economic growth for the area through construction and occupation of the proposed sustainable new homes, supporting the aims of the NPPF.

Construction - The economic benefits of construction are well known with considerable direct and indirect positive impacts resulting from new residential construction.

A study by the Confederation of British Industries (CBI)⁷ demonstrates that construction projects have a significant benefit on the local and wider economy. The report concludes that for every £1 of construction expenditure £2.92 is injected into the economy.

The construction of new homes will therefore provide opportunities for local employment as well as increased revenue locally for materials, services and goods.

Occupation – Further positive economic impacts of the proposed development resulting from the occupation of new homes and related increase in local population are noted as follows:

- The construction of c.100 new homes will increase the population resulting in local benefits through the demand for goods and services;
- The development of new homes will provide an increase in Council Tax revenue helping support local Council services; and

⁷ <https://www.cbi.org.uk/media/4121/fine-margins-february-2020-cbi.pdf>

- The increase in local population will also help support local facilities, groups and stores helping promote the vitality of Gravesham and beyond.

The proposed development will help support the local community with the delivery of new homes, including 50% affordable housing, exceeding the requirements of the local **Policy CS16**, public open space, and proposed pedestrian/cycle routes connecting the neighbourhood.

3.2 Promoting Sustainable Transport

A Transport Assessment has been prepared by Velocity Transport Planning Ltd (VTP) summarising the existing conditions in the vicinity of the Site, the accessibility of the Site relative to local facilities and services and outlining the development proposal for the Site in line with the requirements of Gravesham local plan **Policy CS11: Transport**.

This section of the report provides a summary of the sustainable access and transport measures available and incorporated into the development.

The proposed development is located to the north of The Drove Way in Istead Rise village, a suburban settlement situated to the south of Gravesend, between the A2 trunk road to the north and Meopham village to the south.

Walking – The pedestrian environment within Istead Rise is generally of good quality, with footways provided along The Drove Way and throughout the residential estate. The proposed access designs incorporate 2m footways on both sides of each new access road, providing a direct, footway-level connection between the development and the existing pedestrian network.

Cycling - The local road network within Istead Rise comprises relatively low-traffic residential streets suitable for cycling. There are no dedicated cycle lanes in the immediate vicinity of the Site; however, quiet residential streets with low traffic volumes are generally accepted as suitable for cycling use.

Homes will be provided with cycle storage to help support the uptake of sustainability transport.

Bus Services – The nearest bus stops are located on Flowerhill Way (Littlecroft), approximately 450m south-west of the Site, and at the Istead Rise shops, approximately 700m south of the Site. Both stops are accessible within a comfortable 10-minute walk. These stops are served by a number of services providing connections, including:

- Sevenoaks – Gravesend
- New Ash Green – Wrotham
- Istead Rise – Rochester
- Meopham – Kings Farm

Rail Services – The nearest railway station is Meopham Station, situated approximately 3.1km to the south, equating to approx. 15 minutes by 308 bus service, or 11 minutes cycling. Meopham Station provides a frequent, well-connected rail service to London Victoria, Chatham, Rochester, Gillingham, and beyond.

Local Services and Amenities – The site is highly accessible and within walking and cycling distance to a variety of essential amenities that would support the proposed residential use, including:

- Groceries
- Park/Green space
- Fitness opportunity
- Post Office
- Community Centre
- Pharmacy
- Medical Centre
- Nursery
- Primary School.

Electric Vehicles – Electric vehicles charging points will be provided in line with Part S of the Building Regulations.

An Outline Residential Travel Plan has been prepared by VTP to support and encourage the uptake of active and public transport modes setting out the proposed strategy for development. This includes preparation of Travel Welcome Packs, household travel surveys and providing advice on transport related subjects to residents and visitors.

More detailed information on transportation issues and targets is contained in the Transport

Assessment and the Outline Residential Travel Plan which accompany the planning application.

3.3 Promoting Healthy Communities

Creating a high-quality development that promotes health and wellbeing for residents and visitors is a key aim of the scheme. In this context the design has been developed to enhance the health and wellbeing of the residents in line with Council's **Policies CS12, CS14, CS15 and CS16**.

To promote healthy communities, key elements of the illustrative masterplan include:

- A mix of dwellings in line with latest Strategic Housing Needs Assessment (to be determined at Reserved Matters stage).
- 50% affordable housing.
- Existing green infrastructure will be retained, enhanced and protected.
- New open space areas, including amenity green space, natural 'play-on-the-way' provision for young people and children, and orchard area.
- Pedestrian/cycle paths allowing movement through the open space and providing links with the existing public rights of way and open space.
- Habitat creation, including lowland mixed deciduous woodland, modified grassland (amenity grassland), other neutral grassland (wildflower meadow), traditional orchard, sustainable drainage systems, and individual trees.

In addition, the design of the homes will consider measures to improve internal living environments in line with **Policy CS19**, and **the Council's Design Code SPD**, including:

- Maximisation of natural daylight in occupied areas such as bedrooms and lounges; and
- Utilisation of materials and services that have low emission rates and pollutants.

More information on how the development has incorporated healthy living opportunities is contained within the DAS which accompanies the planning application.

3.4 Meeting the Challenge of Climate Change

3.4.1 Climate Change Mitigation – Energy and Carbon emissions

One of the NPPF's core planning principles is for development to consider climate change adaptation and mitigation during the planning process, as set out in Paragraph 163. Local **Policy CS19** requires new development to deliver carbon reductions and be resilient to the effects of climate change.

In this context, the following sections outline the key climate change mitigation measures considered appropriate for this development based on the latest national guidance.

In relation to construction and the built environment, there are two key sources of carbon emissions:

- **Embodied Carbon** – Carbon emissions related to the materials and components that make up buildings.
- **Operational Carbon Emissions** – Carbon emissions related to energy consumption in the day to day running of a building.

The following sections consider the measures that will be implemented to reduce and manage both operational and embodied carbon.

Reducing Embodied Carbon Emissions

As the energy efficiency of buildings improves through the introduction of new building standards, minimising construction stage emissions becomes increasingly important. This is reflected in local **policy CS19 Development and Design principles** and **Design for Gravesham SPD**, which require new development to incorporate sustainable construction standards and techniques, including off-site construction methods.

To reduce construction carbon emissions, focus will be given to the top carbon impacts within homes and buildings. The Future Homes Hub 'Embodied and Whole Life Carbon of Future Homes Standard Options' Report ⁸ estimates top impacts will comprise:

- Ready-mix concrete.
- Brick and mortar.
- Blocks.
- Steel frame.
- Reinforcement steel (rebar).
- Emissions associated with construction activities.

Measures which will be explored at the appropriate design stage to reduce carbon emissions at infrastructure and building level include:

- Balancing cut and fill material as far as possible either on-site or locally on nearby site.
- Reuse of site-won material.
- Material efficiency, reducing steel and concrete within the design as far as possible, and avoiding overengineering.
- Replacing cement with lower carbon (and local where possible) alternatives.
- Sourcing materials which have Environmental Product Declarations (EPDs).
- Use of natural materials such as timber and stone.
- Procuring materials locally, to reduce carbon emissions associated with the transport of materials.
- Use of electric machinery during construction.
- Use of biodiesel or hydrotreated vegetable oil (HVO) during construction.
- Use of refrigerants with a low GWP.

Reducing Operational Carbon Emissions

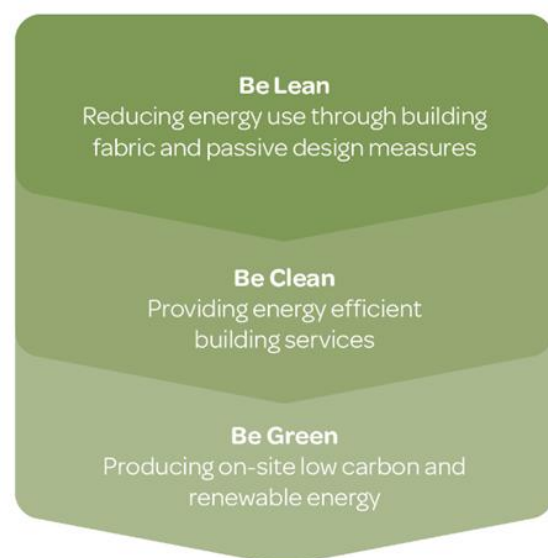
Developing energy efficient, low carbon buildings is a key objective of national policy and the recent updates to the Building Regulations through the FHS support the reduction of energy demand through efficient building design. The Council's local plan promotes increasing local renewable and low carbon energy generation and increasing the energy efficiency of homes through **Policy CS18 Climate Change** and **Policy CS19 Development and Design principles**.

The development at Land to the North of The Drove Way will be designed to comply with the building regulations in place at the time of development. At this stage this includes compliance with Building Regulations Part L 2021, and subject to transitional arrangements the FHS.

The FHS will require all homes to be 'net zero ready', meaning they will be all-electric and need no further work or retrofitting to achieve net zero as the electricity grid decarbonises.

Homes will be designed in accordance with the Energy Hierarchy, as shown in **Figure 3**. The Energy Hierarchy aims to reduce energy demand through passive design measures and a fabric first approach before utilising low carbon energy and the production of on-site renewable energy.

Figure 3: The Energy Hierarchy



⁸ [Embodied and Whole Life Carbon of Future Homes Standard Options](#)

The following sections set out the measures to be considered to deliver an energy efficient, low carbon development.

Be Lean – Reducing Energy Use

Central to the delivery of low carbon and energy efficient buildings is the 'Fabric First' principle which recognises the most effective way of minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This 'fabric first' approach has a number of distinct benefits including:

- Carbon savings delivered are 'locked-in' for the lifetime of the building (60 years or more) rather than the much shorter lifespan (around 25 years) of a renewable energy technology;
- Virtually no maintenance and/or replacement costs to maintain carbon reductions through improved fabric;
- Less reliance on an occupier's behaviour to deliver carbon reductions.

The design of new homes will aim to reduce thermal energy demand by targeting improved air leakage and fabric u-values. These are likely to be in line with the notional values used in SAP10.3 as one of the compliance routes to FHS. The values as shown in the table below.

Table 1: FHS air leakage and fabric u-values

Building Element	Future Homes Standard
Wall (W/m ² K)	0.18
Roof (W/m ² K)	0.11
Floor (W/m ² K)	0.13
Windows (W/m ² K)	1.2
Air tightness (m ³ /m ² .h @50Pa)	4-5

In addition to consideration of an enhanced fabric specification, the following measures to reduce energy use and carbon emissions will be considered in the detailed design of individual homes:

- Design to promote passive solar gains and maximise ventilation;
- Design which aims to optimise natural daylight;
- Incorporation of high efficiency lighting targeting 100% of all light fittings as low energy lighting e.g. LED; and
- Where appropriate, specification of high energy efficient equipment and appliances will be provided that use less energy and water.

Through these measures it is anticipated the development will significantly reduce energy demand and carbon emissions.

Be Clean – Efficient Energy

The second stage of the energy hierarchy is to meet remaining energy demands through high efficiency building services and controls.

Homes built to the FHS would benefit from enhancements to building services and controls, including increased heat pump efficiency, increased ventilation and extraction fan efficiencies, increased efficiency for internal and external lighting, and enhanced external lighting controls to reduce the energy demand of these building elements, therefore reducing operational carbon emissions.

The 'Be Clean' stage also considers delivering energy efficiently through connecting into an existing District Heating Network or communal heat network. District Heating Networks comprise a centralised heat generator, typically a gas fired Combined Heat and Power (CHP) engine. CHP systems generate electricity and waste heat which can be fed into a network of insulated pipes which deliver low carbon heat to buildings to provide heating and hot water via individual heat transfer units.

The continued decarbonisation of the national electricity network means that the carbon emission benefits of electric systems far outweigh gas

systems, even when delivered as part of a community or district network.

Homes delivered in line with the FHS would be all-electric and need no further work to achieve net zero as the electricity grid decarbonises. Therefore, a dwelling-specific heat pump solution would be more efficient, cheaper overall, and have a better environmental impact.

Be Green – Low Carbon and Renewable Energy

The final stage of the Energy Hierarchy is the generation of low carbon and/or renewable energy. Details of the specific renewable technologies that will be incorporated on site will be subject to a future reserved matters application. However, the following section provides a review of the potential low carbon renewable energy technologies suitable for inclusion during the detailed design of the development.

Solar Photovoltaics (PV) - Solar photovoltaic (PV) systems generate zero carbon electricity from sunlight and are well suited to dwellings with unobstructed southeast to southwest facing roof space. Excess power is exported to the grid or can be harnessed using battery storage. Maintenance requirements are typically minimal.

Roof spaces will be designed to accommodate Solar PV to facilitate the delivery of the FHS.

Heat Pumps - Heat pumps provide low carbon heat sourced either from the ground (Ground Source Heat Pumps/ GSHP) or air (Air Source Heat Pumps/ ASHP). This type of system is suited to thermally efficient buildings. They require main electricity to operate but typically generate at around three units of heat for every unit of electricity that is consumed.

In line with the FHS, homes are likely to make use of low carbon heating such as ASHP to provide low carbon heat and hot water.

Energy Strategy Summary

In summary, the proposed homes will be designed to meet the requirements of the building regulations in place at the time of development.

The detailed design of homes will incorporate a range of fabric and energy efficiency measures, as well as low carbon and renewable energy technology. This is likely to include:

- Enhanced building u-values and air tightness;
- Use of a range of energy efficiency measures including low energy lighting;
- Provision of low carbon/renewable energy, such as ASHP and design for Solar PV.

Once implemented, the FHS will deliver homes which are net zero ready, meaning it would require no further work to achieve net zero as the electricity grid decarbonises. The UK government is aiming to “fully decarbonise” Great Britain’s electricity grid by 2035. Residents will also be able to purchase certified renewable electricity to allow them to operate as net zero from the outset.

Table 2 shows the estimated operational carbon emissions from the proposed development, should it be built in line with the FHS requirements. It also shows baseline operational emissions of homes should they be built to the current standards. This is based on RIBA Business-As-Usual (BAU) and RIBA 2025 benchmark information available for a limited number of the proposed building types. Individual building types, specification and performance will vary.

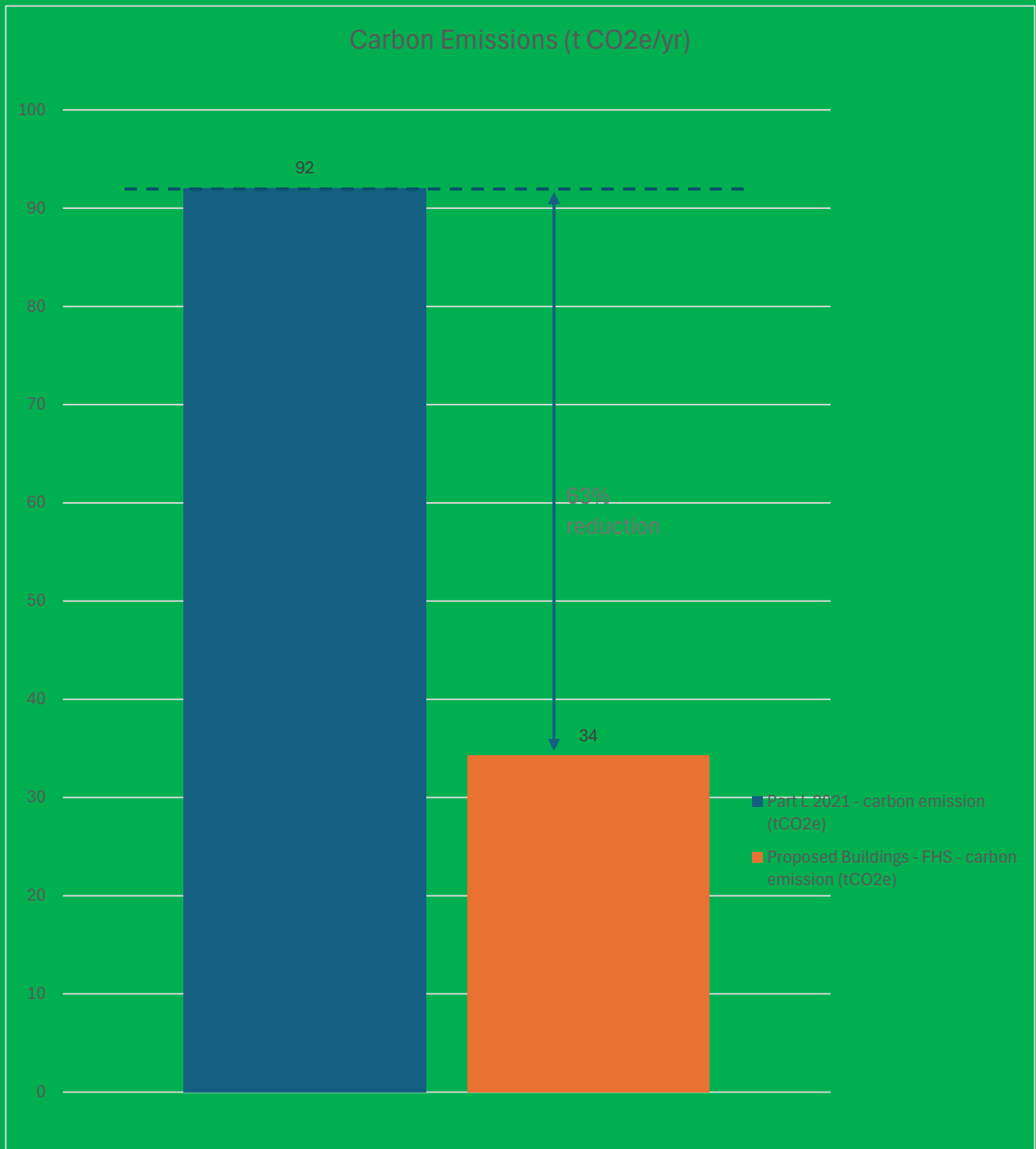
Table 2: Estimated Regulated Operational Carbon Emissions

	Carbon emissions (tonnes CO ₂ e/yr)
Part L 2021	92
Proposed Dwellings	34
Emissions reduction	58
% reduction	63%

The final specification of homes, including details of fabric specification, energy efficiency measures and low carbon and renewable energy generation installed will be subject to the detailed design of individual homes.

What are the carbon emissions of development at Land to the North of The Drove Way, Istead Rise, Gravesham?

The graph below shows the estimated carbon emissions of the proposed development at Land to the North of The Drove Way, should they be delivered in line with the FHS.



3.4.2 Climate Change Adaptation and Resilience

Climate projections from the UK Met Office demonstrate that the UK will experience increased average and maximum summer and winter temperatures, reduced summer rainfall, increased winter rainfall, and an increase in extreme weather events. Adapting to this changing climate will impact on the design, construction, location, cost and operation of all new buildings.

Key risks associated with the effects of climate change in relation to the built environment therefore include reduced summer water availability, increased winter rainfall and increased summer temperatures.

A range of measures will be adopted to promote the resilience of the development at Land to the North of The Drove Way to future climate change effects in line with the requirements of the local **Policies CS18, CS19 and the Design Code SPD**.

In this context the following sections outline the key climate change adaptation measures considered appropriate for this development based on the latest national and local guidance.

Water Efficiency

Potable water is an increasingly important natural resource and with the majority of the UK classed as being in an area of moderate or severe water stress the conservation of water is becoming a more significant sustainability metric.

The homes will aim to reduce water consumption through a range of water efficiency measures such as:

- Reduced flush WCs;
- Low flow fittings such as taps and showers; and
- Where appropriate, water efficient equipment.

Planting and green infrastructure will be designed to be drought resistant, ensuring that watering demand is as low as possible.

Consideration will also be given to the provision of homes with water butts to allow for rainwater

harvesting for garden use in line with the requirements of the **Design for Gravesham SPD**.

Through the use of these measures new homes will aim to achieve a water consumption rate of **105 litres/person/day** in line with the water efficiency target set out in the local **Policy CS18 Climate Change**, which exceeds the requirements of Building Regulations higher water standard of 110 l/p/d.

Flood Risk and Drainage

Flood Risk Assessment (FRA) and Surface Water Drainage Strategy has been prepared by Logika Consultants Ltd to review the potential risk of flooding to the Site and measures to manage surface water, supporting the requirements of **NPPF** and local **Policy CS18**.

The site is located within Flood Zone 1 and considered to be at a low risk of flooding from pluvial, groundwater and artificial sources. The proposed residential units are therefore located in a sequentially preferable area and mitigation to manage flood risk to the site is not considered necessary.

The existing Site is greenfield in nature and it is anticipated that the Site currently drains naturally via infiltration. At the outline stage, the drainage strategy has been designed to mimic the existing drainage scenario as much as possible. The strategy utilises infiltration basins which have been sized to accommodate runoff from the hardstanding areas of the Proposed Development in line with planning policy and guidance utilising the worst-case scenario design parameters. At the detailed design stage the use of other SuDS will be incorporated into the scheme.

Attenuated storage will be provided for the 1 in 100-year event storm including a 45% allowance for climate change, in line with national guidance.

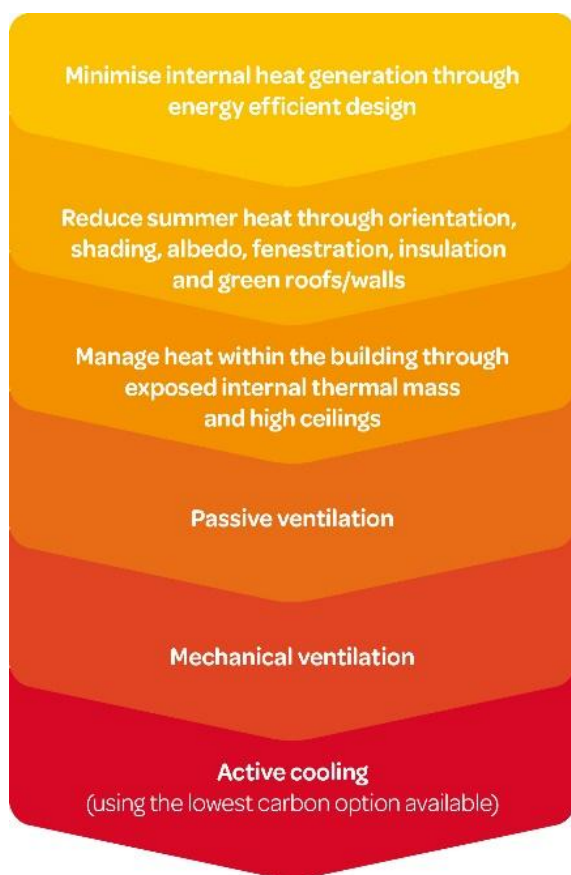
Further information on the Site's flood risk and the proposed surface water management system can be viewed in the accompanying FRA and Surface Drainage Strategy.

Overheating

With increasing summer temperatures there is an increasing risk of overheating in homes which could adversely affect the residents.

The proposed development at Land to the North of The Drove Way will be designed in accordance with the cooling hierarchy, as shown in **Figure 4**, which aims to reduce any potential overheating in buildings through minimising heat generation first, followed by the consideration of passive cooling measures, and finally provision of active cooling using the lowest carbon option.

Figure 4: Cooling Hierarchy



Incorporating the cooling hierarchy into the design process means homes will be better equipped to manage their cooling needs and adapt to climate change, while also minimising the carbon emissions associated with reducing overheating risk.

Passive measures that could potentially be incorporated into the design of individual homes to

reduce cooling demand and the risk of overheating include:

- Deciduous tree planting, providing shade in summer and allowing solar gains in winter;
- Extensive green and blue infrastructure to reduce the urban heat island effect;
- High albedo surfaces;
- Brise soleil over windows which may be at risk of excessive solar gain.

An Overheating Assessment in line with the requirements of **Part O** of the Building Regulations will be undertaken as part of the detailed design of individual homes.

3.5 Conserving and Enhancing the Natural Environment

In line with Council's **Policy CS19**, the proposed development will incorporate measures to support and enhance the environment through consideration of the existing Site ecology, including measures to mitigate the impact of the development and enhance Site biodiversity. The proposed development will also incorporate measures to reduce pollution from the Site.

3.5.1 Ecology

An Ecological Assessment for the site has been prepared by Logika Consultants Ltd.

The Site habitats comprise cereal crop, arable field margin tussocky, mixed scrub and lowland mixed deciduous woodland. Of these, lowland mixed deciduous woodland is identified as a priority habitat. The habitat survey noted that traditional orchard which is present within the woodland parcel has since been destroyed and now forms a continuation of the surrounding woodland, however, has still been treated as priority habitat for the purposes of this assessment.

The Site offers opportunities for the following protected species:

- bats (commuting, foraging, roosting);

- badger (commuting, foraging and sett establishment);
- breeding birds; and
- reptiles.

Mitigation and Enhancement Measures

In order to deliver ecological enhancements at the site for the benefit of local biodiversity the following mitigation measures are proposed:

- retention of mixed scrub and woodland habitats, with lowland mixed deciduous woodland enhanced from poor to moderate condition;
- habitat creation including lowland mixed deciduous woodland, modified grassland (amenity grassland), other neutral grassland (wildflower meadow), traditional orchard, and individual trees;
- a lighting strategy to avoid light spill onto adjacent woodland;
- the establishment of Root Protection Areas (RPAs) to protect retained trees; and
- the use of a Construction Environmental Management Plan (CEMP) and Precautionary Working Method Statement (PWMS).

Biodiversity Net Gain

Based on the habitats and ecological features of the site and subject to the implementation of appropriate avoidance, mitigation and compensation measures, the site will achieve a minimum 10% net gain in biodiversity. Achieving a net gain in biodiversity will help site habitats and species adapt to the effects of climate change.

More details on the above can be found in the Ecological Assessment which accompanies the planning application.

3.5.2 Pollution

The proposed development will aim to minimise any negative impacts on the natural environment considering the impacts of water use and materials.

Water – Throughout construction, water quality will be maintained by the following measures:

- Reduce erosion and run-off by minimising land disturbance and leaving vegetation cover where possible;
- Cover skips and trucks loaded with construction materials and continually damp down with low levels of water;
- Use non-toxic paints, solvents and other hazardous materials wherever possible; and
- Segregate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.

Sustainable Materials – Insulation materials containing substances known to contribute to stratospheric ozone depletion or with the potential to contribute to global warming will not be used. Natural insulation materials such as mineral wool, rock wool or cork board will be considered as they are amongst the lowest Global Warming Potential (GWP) rating.

To further enhance the development a number of additional measures will be incorporated into new homes to minimise pollution, including:

- The use of key internal finishes and fittings which comply with best practice emissions levels of Volatile Organic Compounds (VOCs) and other substances;
- Specification of low Global Warming Potential (GWP) and zero Ozone Depleting Potential (ODP) insulation materials.

In addition, the development will aim to use a range of sustainable materials and design features and will make use of:

- Sustainable timber from FSC (or equivalent) sources; and
- Low carbon materials.

3.6 Sustainable Resources

The development at Land to the North of The Drove Way will help protect natural resources through the management of waste during construction and operation.

Waste will be managed in accordance with waste hierarchy, which prioritises waste prevention, followed by re-use, recycling, then energy recovery and disposal as a last resort (as set out in **Figure 5**).

Figure 5 The Waste Hierarchy (The Waste Framework Directive)



Construction Waste Management

Prior to the commencement of construction phase a Construction Environmental Management Plan (CEMP) and a Site Waste Management Plan (SWMP) will be developed setting out measures to minimise waste during the construction phase of the proposed development.

The reduction, reuse and recycling of construction waste is to be prioritised through measures such as avoidance of over-ordering, supervision of deliveries, use of secure materials storage facilities and reuse of materials onsite where feasible. Remaining waste will be segregated in covered skips for recycling at off-site facilities, with regular collections to prevent accumulation.

Operational Waste Management

Full consideration will be given to the Council's waste management infrastructure and services to ensure that the occupiers have the necessary infrastructure to participate in any kerbside recycling services.

In accordance with the principles of the waste hierarchy, and in line with the requirements of the **Policy CS19 Development and Design Principles**, the development will make provision for the storage of recyclable and non-recyclable waste. Refuse storage areas will be designed to be easily accessible for both occupants and refuse vehicles.

Prior to the commencement of construction, the relevant waste collecting authority will be consulted on the final form of facilities proposed in accordance with the requirements of the Council's validation checklist.

4. Conclusion

This Sustainability and Energy Statement has been prepared to demonstrate how the proposed development responds positively to national and local sustainable policy requirements.

The proposed development will be designed to respond positively to national and local plan policy incorporating measures to deliver social and economic benefits, while also protecting and enhancing the environment where possible. This includes the consideration of measures to mitigate and adapt to the effects of climate change.

The key sustainability measures incorporated at this stage of the proposed development have been set out within previous chapters and are summarised below.

Social and Economic Benefits – The development aims to provide a range of social and economic benefits to both new and existing residents, through:

- Construction of c.100 homes providing economic benefits and opportunities for local people;
- Homes designed to create healthy living environments with a mix of dwellings in size and type, including 50% affordable housing units;
- Provision of new open space areas, including amenity green space, natural 'play-on-the-

way' provision for young people and children and orchard area;

- A development in a sustainable location with multiple sustainable and active travel options.

Environmental Protection and Enhancement – Through a range of design measures the development aims to protect and enhance the local environment, including:

- Homes designed to make use of sustainable materials to reduce environmental impacts of construction;
- Development designed to prioritise sustainable and active modes of transport, including bus and rail travel, walking and cycling;
- Provision of measures to protect on-site ecology and enhancement measures to deliver at least a 10% biodiversity net gain, which also helps reduce the impact of climate change on site habitats; and
- Provision of measures through construction and operation of the site to reduce pollution, minimise waste and encourage recycling.

Mitigating and Adapting to Climate Change – In recognition of the climate emergency and local policies relating to climate change the development will aim to incorporate a range of measures to reduce carbon emissions, mitigate the effects of climate change, and to ensure the long-term resilience of the development to the effects of climate change. Measures include:

- A design which will consider the embodied carbon associated with construction materials, and select sustainable products where possible to reduce environmental impacts of construction;

- Homes designed to meet the requirements of the building regulations in place at the time of the development. The detailed energy strategy will incorporate an enhanced fabric specification, and renewable energy generation in the form of solar PV and/or ASHP. Homes built to the FHS would all-electric and net zero ready, meaning they would need no further work to achieve net zero as the electricity grid decarbonises. Residents would also be able to purchase certified renewable electricity to allow them to operate as net zero from the outset.
- Specification of water efficient fittings to reduce water consumption aiming to achieve a target of 105 litres per person per day;
- Reduced emissions associated with private car travel though development in a sustainable location with access to public transport and amenities and installation of EV charging points;
- The development is located in flood zone 1 and will include a range of SuDS measures to manage surface water designed to accommodate a 1 in 100 year event including a 45% allowance for climate change; and
- Homes designed to take into account increasing annual temperatures set out in the UKCP18 climate projections to minimise the risk of overheating.

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