BROOKBANKS

Land at Hemingfield

Energy and Sustainability Statement

Ptarmigan Land North Ltd

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Contents

Figures

Tables

1 Introduction

1.1 This Energy and Sustainability Statement has been prepared by Brookbanks (BCL) on behalf of Ptarmigan Land North Ltd in support of an application for outline planning permission for the demolition of existing structures and the erection of residential dwellings with associated infrastructure and open space. All matters reserved except for means of access to, but not within, the site.

1.2 The objective of this document is to demonstrate that the proposed development will be underpinned by social, economic and environmentally sustainable principles through complying with international, national and local policy to deliver a sustainable development.

1.3 An energy strategy is set out for the development based on the Future Homes Standard (FHS) for predicted regulated energy demand, which is due for implementation from 2025.

1.4 The report also explores a range of sustainability initiatives to embed into the proposed development in compliance with Barnsley Metropolitan Borough Council's (BMBCs) policy surrounding the matter.

1.5 Consideration has been given to the practicality, deliverability and certainty of proposed measures and strategies to ensure that they adhere to the overarching aim **to deliver a sustainable development.**

1.6 This report contains the following chapters:

- **Section 2 –** Background Information and development criteria
- **Section 3 –** Policy review: Overarching policy
- **Section 4 –** Policy review: Local policy
- **Section 5 –** Energy Strategy
- **Section 6 –** Sustainability Strategy
- **Section 7 -** Summary and limitations

2 Description of Development

2.1 The application is for outline planning permission for the demolition of existing structures and the erection of residential dwellings with associated infrastructure and open space. All matters reserved except for means of access to, but not within, the site.

2.2 The Illustrative Masterplan for the Application Site can be found in **Appendix A**.

3 Policy Review: Overarching Policy

3.1 This sustainability strategy is underpinned by international, national and local policy.

3.2 The overarching objectives applied to this sustainability strategy is the UN Sustainable Development Goals, which address social progress, economic wellbeing and environmental protection, see Figure 3-1 below.

Figure 3-1: UN Sustainable Development Goals

3.3 The UK Government has agreed to pursue these objectives. Therefore, where practible and feasible, relevant objectives will be embeded into the scheme.

3.4 The Climate Change Act 2008 (CCA08), was the first statutory legislation limiting CO2 emissions anywhere in the world. CCA2008 mandates that carbon emissions are reduced by 80% by 2050 (against a 1990 baseline), with targets set at 34% by 2020 and 60% at 2030. This has since been amended in 2019, with a new target to achieve net carbon zero by 2050. It is this primary legislation that drives local planning policy.

3.5 National Policy for Sustainable Practices and Technology is informed by:

- National Planning Policy Framework (NPPF) (December 2023) published by the UK Government.
- UK Building Regulations Approved Document Part F guidance on building ventilation published by the UK Government (June 2022).
- UK Building Regulations Approved Document Part L guidance for energy efficiency, fuel and power published by the UK Government (June 2022).
- UK Building Regulations Part F guidance on building ventilation published by the UK Government (February 2022).
- UK Building Regulations Approved Document O for overheating mitigation published by the UK Government (June 2022)
- UK Building Regulations Approved Document Part S guidance on infrastructure for charging electric vehicles, published by UK Government (February 2022).
- Future Homes Standard – designed to complement the UK Building Regulations to ensure new build homes significantly reduce carbon emissions as of 2025. The Ministry of Housing, Communities and

Local Government White Paper, January 2021, confirmed that all future homes will be net zero ready from 2025.

3.6 The main aim of these documents is to inform policy and provide guidelines to reduce CO2 emissions, as this is currently considered to be the largest man made contributor to climate change.

National Planning Policy Framework (NPPF)

3.7 The NPPF was first published in March 2012 and was last updated in December 2023. It defines the overarching aims of the Government's sustainable development strategy.

3.8 Within the Section 2: Achieving Sustainable Development, it states that "the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

a) ***"an economic objective*** *– to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*

b) ***"a social objective*** *– to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*

c) ***"an environmental objective*** *– to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy (paragraph 8).*

"These objectives should be delivered through the preparation and implementation of plans and the application of the policies in this Framework; they are not criteria against which every decision can or should be judged. Planning policies and decisions should play an active role in guiding development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area (paragraph 9)."

3.9 Within Section 14: Meeting the challenge of climate change, flooding and coastal change, the NPPF outlines that local authorities should adopt proactive strategies to mitigate and adapt to climate change and that to support the move to a low carbon future new development should be planned in ways that:

"Avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

"Can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards."

3.10 The NPPF stresses that the importance of sustainability in new developments is to ensure that during construction and operation the development minimises environmental impact. The Government is keen to limit the environmental impact of new construction projects through the reduction of CO2 emissions.

3.11 Where possible, the proposed development seeks to integrate the principles within this policy where

feasible to deliver a sustainable development.

Building Regulations and the Future Homes Standard

3.12 Previous national standards, namely Code for Sustainable Homes (CfSH) and the Zero Carbon Homes, have been superseded, with national standards now defined largely by the UK Building Regulations.

3.13 In June 2019, the Government set a commitment in the Climate Change Act 2008 for the United Kingdom to reach 'net zero' greenhouse gas emissions by 2050.

3.14 As part of the Government's intention to lead all future improvements through the UK Building Regulations, in October 2019, the Ministry of Housing, Communities and Local Government (now the Department for Levelling Up, Housing and Communities) issued a Consultation on changes to Approved Document Part L (conservation of fuel and power) and Approved Document Part F (ventilation) of the Building Regulations for new dwellings.

3.15 This consultation sets out the Government's plans for achieving the Future Homes Standard by 2025, to provide low carbon heating and high levels of energy efficiency, including proposed options to increase the energy efficiency requirements for new homes through a step change to Approved Document Part L of the Building Regulations.

3.16 The consultation considered two options for the proposed step changes to Approved Document Part L, which are set out below:

- **Option 1:** 20% reduction in carbon emissions compared to the current standard for an average home. It is anticipated that this could be delivered by very high fabric standards (typically with triple glazing and minimal heat loss from walls, ceilings, and roofs).
- **Option 2:** 31% reduction in carbon emissions compared to the current standard. It is anticipated that this could be delivered based on the installation of carbon-saving technology such as photovoltaic (solar) panels and better fabric standards, though not as high as Option 1.

3.17 Following a second consultation from 18 January to 13 April 2021, 'Option 2' is the confirmed route forward, with all new homes required to have a 31% reduction in CO_2 emissions from 2022 in comparison to current standards.

3.18 The Government summarised their response to these consultations that covered these discussions (The Future Homes Standard: 2019 Consultation on changes to Approved Document Part L and Approved Document Part F of the Building Regulations for new dwellings). In order to deliver the 31% reduction, new homes will be assessed against four performance metrics:

- Primary energy;
- Minimum standards for fabric and fixed building services;
- The Fabric Energy Efficiency Standard (FEES); and,
- Carbon dioxide emissions.

3.19 Therefore, the proposed development will seek to address these metrics through integrating efficient primary energy sources, ensuring high standard fabrics and reducing carbon emissions.

3.20 FHS has since been further defined as of December 2021. It is now clear that all future homes will be required to be "net zero ready" by 2025.

3.21 New interim Approved Document Part L (Conservation of Fuel and Power) and Approved Document Part F (Ventilation) were published in December 2021, to be adhered to from June 2022, before more significant changes in 2025 that will require a 75% reduction is CO_2 emissions, in line with FHS.

3.22 Interim uplifts to Approved Document Part L in December 2021 introduced minimum fabric efficiency standards and has adopted a full fabric specification for the Fabric Energy Efficiency Standards (FEES). Additionally, limits on maximum flow temperatures and a detailed good practice specification for dwellings with inbuilt heat pumps have been published.

Energy Hierarchy

3.23 The Building Regulations outlined in Approved Document Part L1A, relate to energy used in providing space heating and cooling, hot water and fixed lighting, and follow the energy hierarchy below (Figure 3-2) in determining the methodology to reduce energy demand, and therefore carbon emission reductions, necessary to comply with the Building Regulations.

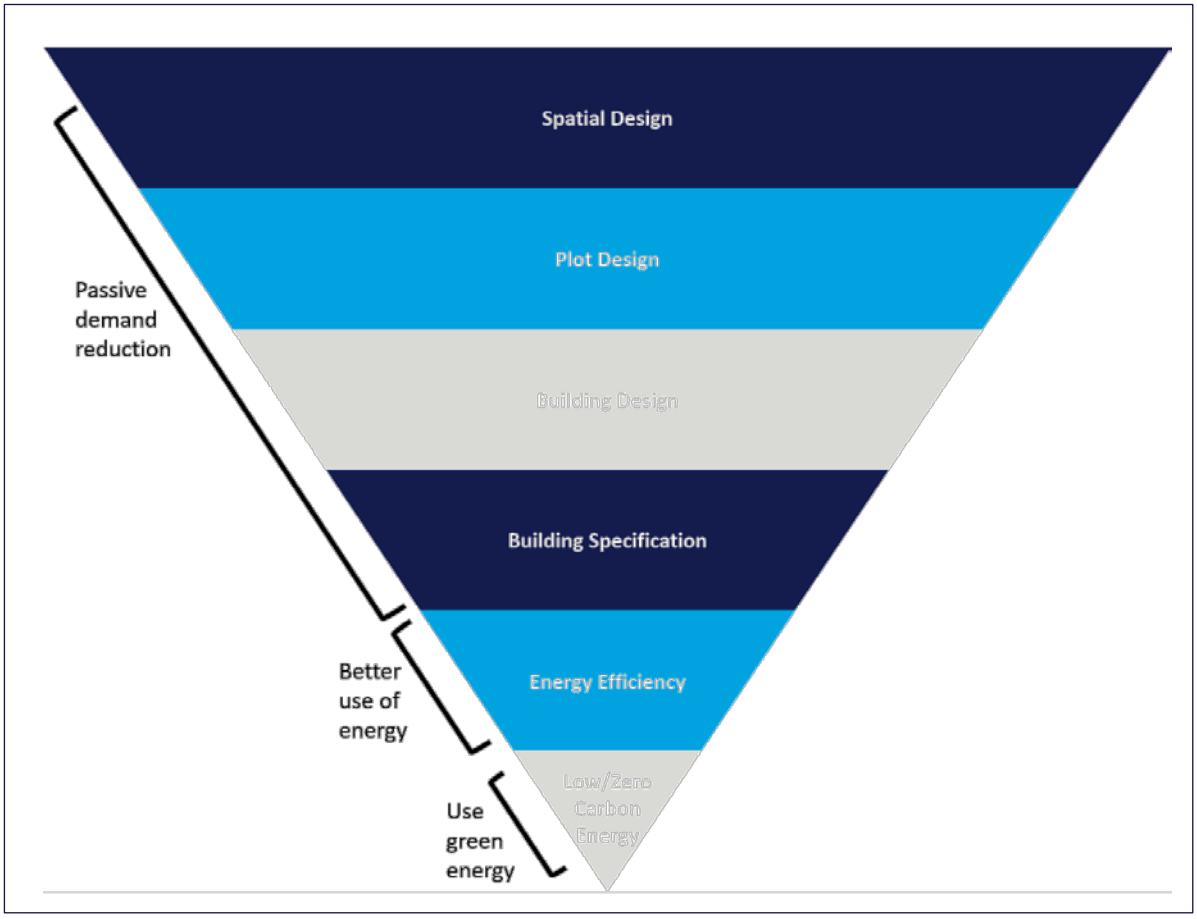

Figure 3-2: Energy Hierarchy

3.24 To meet the first principles of the hierarchy (i.e., reducing energy demand), passive design principles can be applied. Passive measures are design features from architectural and building fabric selection that inherently reduce the building energy requirement. These measures can include:

- Solar master planning, designing to take advantage of natural daylight and careful consideration of building orientation, fenestration and alignment.

- Mixed-uses and green infrastructure provision through landscaping to provide active and passive cooling effects.
- Reducing the air permeability and thermal bridging coefficient of the building envelope.
- Optimising the U-Values of the external fabric to enable a reduction in energy loss. U-values are calculated through determining the rate of heat transfer through a structure divided by the difference in temperature across the structure. These values can therefore be reduced through providing additional insulation to buildings and high-quality windows such as triple glazing.
- Incorporating thermal mass to support "free cooling" during summer months and warmth in the winter. Thermal mass enables a building to store heat and provide resilience against temperature fluctuations through absorbing excess heat and slowly releasing over time.
- Enlarging window areas to maximise the use of natural daylight.
- Locating any plant rooms away from the southern elevation to avoid excessive heat gain and to allow maximum plant efficiency.
- Providing passive shading to avoid overheating.
- Provision of post occupancy training material - post occupancy behaviour change also comes within the 'passive' category.

3.25 Additional, active measures should be integrated where practicable. Active measures are associated with the specification, control and use of building services that will increase the efficiency of the energy used, hence reducing the building energy requirements. These include:

- High efficiency boilers.
- Controls to optimise and compensate for heating variations.
- Zonal control of heating to supply various parts of a building via a building management system.
- Time and thermostat control of hot water.
- Variable speed drives fitted to those pumps and fans that will benefit from speed control.
- High efficiency lighting.
- Installation of electricity check meters.
- Include daylight and passive infra-red motion detection systems to lighting in common areas in order to ensure they are only operated when required.
- Ensuring white goods, where supplied, are suitably rated or alternatively, information is provided on selecting energy rated appliances.
- Rejected heat capture and re-use, especially from Heating, Ventilation and Air Conditioning (HVAC) systems and (yet to be defined) commercial/industrial activities.

3.26 Alongside this, the UK Government released Approved Document Part O in December 2021, which sets out a range of guidance for overheating mitigation through integrating design measures such as limiting solar gains, cross ventilation and methods for removing excess heat.

3.27 It is evident that a fabric first approach will be pivotal to the future construction of housing, with new builds 'future-proofed' to be able to achieve carbon zero and have low carbon heating initiatives.

3.28 Launch of the technical consultation in Spring 2023 on the proposed specification for the FHS, with regulations to be developed in 2024 for implementation in 2025.

3.29 The timescales and measures set out above make it clear that these more stringent and more demanding Building Regulations standards will apply to the construction of the proposed development, meaning that a range of low carbon and resource efficiency measures will be a requirement as the scheme is delivered.

3.30 Part of this strategy is the reliance of low carbon heating, specifically heat pumps, to deliver heat to homes and remove the reliance on gas heating. Heat networks are referred to, but only because of the potential ability to move to low and zero carbon technologies with minimal disruption to homeowners.

3.31 While emphasis on energy efficiency is made within the consultation document, the proposals, as currently written, could allow for inefficient buildings with compensatory technologies as opposed to the previous strategies to achieve Zero Carbon, which relied on fabric improvements first, with low and zero carbon (LZC) technologies to bridge the gap.

3.32 There is an undoubted reliance on the future de-carbonisation of the grid electricity to do the "heavy lifting" and provide the remaining 25-30% carbon reduction over and above the FHS to achieve the zero-carbon target by 2050.

3.33 It should be noted that the Part L and FHS is only concerned with an individual dwelling for assessment and not the development as a whole.

UK Building Regulations Part S: Electric Vehicle Charging Points

3.34 As part of the Government's aims to achieve net zero greenhouse gas emissions by 2050, policies are being put in place, including Regulations that state all new cars and vans should be zero emissions, which will see Electric Vehicles (EVs) become increasing common.

3.35 As a result, Approved Document Part S was released in February 2022, which focusing on non-residential and mixed-use building on the infrastructure for EV charging points (EVCPs), shown in **Figure 3-3**.

The erection of new residential buildings

S1. (1) A new residential building with associated parking must have access to electric vehicle charge points as provided for in paragraph (2).

(2) The number of associated parking spaces which have access to electric vehicle charge points must be—

(a) the total number of associated parking spaces, where there are fewer associated parking spaces than there are dwellings contained in the residential building; or

(b) the number of associated parking spaces that is equal to the total number of dwellings contained in the residential building, where there are the same number of associated parking spaces as, or more associated parking spaces than, there are dwellings.

(3) Cable routes for electric vehicle charge points must be installed in any associated parking spaces which do not, in accordance with paragraph (2), have an electric vehicle charge point where—

(a) a new residential building has more than 10 associated parking spaces; and

(b) there are more associated parking spaces than there are dwellings contained in the residential building.

Figure 3-3: Part S requirements for Electric Vehicle Charging Points

3.36 Easy access to EVCPs will be essential for the mass transition to EVs for personal transportation. Alongside the decarbonisation of the national grid (discussed in the next section), increased uptake of EVs will significantly lower carbon emissions from transportation.

3.37 The Government has confirmed that it expects all chargers to be 'smart' devices, which will ensure charging will be available without the electricity network being overloaded.

3.38 The proposed development will comply with prevailing legislation.

Decarbonisation of the National Grid

3.39 Decarbonising the National Grid is an essential element to achieving the Government's targets for reducing emissions, with a view to establishing net zero by 2050.

3.40 Clean energy will be required to power an increased number of electric vehicles, home heat pumps as well as a range of other sustainable initiatives.

3.41 In October 2021, the Government announced significant funding in support of generating more nuclear power, marking twelve months since the publication of the Prime Minister's *10 Point Plan for a Green Industrial Revolution*.

3.42 The ten-point plan, released in November 2020, set out the approach that the Government intends to take to *"build back better, support green jobs, and accelerate our path to net zero"*.

3.43 The ten points are:

- ***"Offshore wind**: Producing enough offshore wind to power every home, quadrupling how much we produce to 40GW by 2030, supporting up to 60,000 jobs.*
- ***Hydrogen**: Working with industry aiming to generate 5GW of low-carbon hydrogen production capacity by 2030 for industry, transport, power and homes, and aiming to develop the first town heated entirely by hydrogen by the end of the decade.*
- ***Nuclear**: Advancing nuclear as a clean energy source, across large-scale nuclear and developing the next generation of small and advanced reactors, which could support 10,000 jobs.*
- ***Electric vehicles**: Backing UK car manufacturing bases to accelerate the transition to electric vehicles and transforming our national infrastructure to better support electric vehicles.*
- ***Public transport, cycling and walking**: Making cycling and walking more attractive ways to travel and investing in zero-emission public transport of the future.*
- ***Jet Zero and greener maritime**: Supporting difficult-to-decarbonise industries to become greener through research projects for zero-emission planes and ships.*
- ***Homes and public building**s: Making UK homes, schools and hospitals greener, warmer and more energy efficient, while creating 50,000 jobs by 2030, and a target to install 600,000 heat pumps every year by 2028.*
- ***Carbon capture**: Becoming a world-leader in technology to capture and store harmful emissions away from the atmosphere, with a target to remove 10MT of carbon dioxide by 2030, equivalent to all emissions of the industrial Humber today.*
- ***Nature**: Protecting and restoring the natural environment, planting 30,000 hectares of trees every year, while creating and retaining thousands of jobs.*
- ***Innovation and finance**: Developing the innovative technologies needed to reach these new energy ambitions and make the City of London the global centre of green finance."*

3.44 Although not all of the above principles are applicable or feasible within the proposed development, where possible initiatives will be integrated into the development to enable lower carbon usage and emissions. These include Electric Vehicle Charging Points and accessibility to Public Transport, Cycling and Walking, Homes and Public Buildings, Carbon Capture (through carbon sequestering) and Nature.

3.45 Section 5 of this Statement also identifies the ways in which the scheme will respond to, and integrate, many elements of this national plan to decarbonise development.

Summary

3.46 Overall, new and emerging legislation is seeing a transition to sustainable development as standard, with carbon zero high on the agenda. In the long term, a continued drive for low carbon energy homes can be expected across the UK. This means that the development proposals need to be designed to adhere to relevant and current legislation to meet Building Regulations.

4 Policy Review: Local Policy

4.1 This section explores the current local policy that will influence the proposed development.

Barnsley Local Plan Supplementary Planning Document: Sustainable Construction and Climate Change Adaptation – July 2023

4.2 This Supplementary Planning Document (SPD) sets out the approach to planning decisions in respect of sustainable construction and adapting to climate change. It sets out what the requirements for development are based on the existing Local Plan policies, existing planning practice guidance and national requirements. It also sets out where they would welcome and encourage higher standards and includes information and links to technical guidance.

4.3 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (CCA) sets a net zero emissions target for 2050. The reference point for this target is at least 100% below 1990 emission levels.

4.4 The Council declared a climate emergency in September 2019. To help Barnsley reduce its carbon emissions the Council has two programmes:

i. Zero 40 which will focus on improvements in the Council's performance, working towards being net zero carbon by 2040
ii. Zero 45 where the Council will help the whole of Barnsley, including residents, communities, partners and businesses to become net zero carbon by 2045.

4.5 The Council's Sustainable Energy Action Plan (SEAP) sets out a range of measures to achieve net zero by 2030 and 2045. The Plan is progressive and will be superseded by new strategies supported by other documents such as the Zero 45 Route Map and Affordable Warmth Charter.

4.6 This SPD advises on the range of measures to reduce carbon and resources in major residential, commercial and other development proposals, in accordance with the current SEAP and any future iterations.

5 Energy Strategy

5.1 The strategy set out for the development is based on the anticipated FHS for regulated energy demand, due for implementation from 2025.

5.2 The proposed energy strategy is based on the implemtation of the FHS by 2025. This standard reduces energy demand by 75% from the 2013 Approved Document Part L by 2025 and will build on the 31% reduction over current energy demands on the Approved Document Part L released in June 2022.

5.3 The FHS focuses on the compliance of the individual dwelling as opposed to a whole development approach. Therefore, the Energy Hierarchy forms the foundations of the proposed energy strategy for the development proposals following publication of the FHS.

5.4 Additionally, as the proposed development progresses through the detailed design stages, the energy hierarchy will underpin any proposals and designs.

5.5 It is important to recognise that there are a number of different approaches to achieving sustainability. As a result, rather than defining a singular approach that may not be resilient to changes in technology, policy and market conditions, the approach to sustainability should consider all viable options and opportunities at the time when detailed design is being developed.

Energy Demand Reduction

5.6 The recent step changes in the Approved Document Part L have incorporated energy efficiency and further reductions in CO_2 through a fabric first approach that improves material standards in heating, insulation, and glazing. These measures will ensure good levels of energy sustainability are achieved, in compliance with the Approved Document Part L step change to the Building Regulations and then the FHS.

5.7 FHS sets out a requirement for dwellings to achieve a 75% reduction over the 2013 Building Regulations of regulated energy demand.

5.8 Currently, it is anticipated that this energy reduction will be achieved predominantly through Fabric Energy Efficiency. This is the first element of the zero carbon homes policy hierarchy and makes up part of the Government's wider strategy for achieving net zero in carbon emissions by 2050.

5.9 Passsive and Active design features, technologies and strategies should be integrated into new developments in order to achieve this stated 75% reduction.

- Passive measures are design features from architectural and building fabric selection that reduce the building energy requirement.
- Active measures are associated with the specification, control and use of building services that will increase the efficiency of the energy used, hence reducing the building energy requirements.

5.10 Initial calculations, which are considered below, have evaluated how use of active and passive measures such as fabric first improvements, decarbonisation of the grid and implementation of current technology may impact the proposed development's predicted energy demand.

5.11 These calculations have been conducted under the following assumptions:

- 180no. Dwellings

- Average dwelling floor area of 84 $m^{2.}$

5.12 Table 5-1 below sets out a baseline energy demand from 2013 Building Regulations has been predicted:

Table 5-1: Predicted Energy Demand under 2013 Building Regulations.

Regulated Energy Demand Component	MWh
Space heating	811
Water heating	300
Lighting	73

5.13 Table 5-1 determines that the predicted energy demand for the proposed development under the 2013 Building Regulations is 1,184MWh.

5.14 Further calculations have explored the impact of FHS for total energy demand of the proposed development. Table 5-2 sets out these calculations.

Table 5-2: Predicted Energy Demand under FHS

Regulated Energy Demand Component	MWh
Space Heating	360
Water heating	90
Lighting	73

5.15 This generates a 56% reduction from the baseline 2013 Building Regulations. This achieves the 31% reduction now required under Approved Document Part L, which means that the development proposals would meet Buidling Regulations requirements.

5.16 Integrating energy demand reducing technologies and strategies to lower the total energy demand will allow the proposed development to achieve a minimum of the required 75% reduction required under FHS.

5.17 These strategies are further detailed below.

Air Source Heat Pumps

5.18 Air source heat pumps (ASHPs) provide an active, mechanical mechanism for reducing space heating demand.

5.19 It is widely acknowledged that for every 1kWh of electricity inputted to ASHPs, approximately 3kWh of heat can be delivered, generating an approximate Coefficient of Performance (CoP) of 3. This reduces space heating requirements by approximately one third.

5.20 Calculations in **table 5-3** show energy demand after installation of ASHPs to individual dwellings across the development proposals.

Table 5-3: Energy demand with installation of ASHPs

Regulated Energy Demand Component	MWh
Space Heating	360
Installation of ASHP (3:1 ratio)	- 240 (Rounded saving)
Space Heating (after installation of ASHP)	120 (3260 - 240 = 120)
Water heating	90
Lighting	73

5.21 Integration of ASHPs to each dwelling at the Application Site reduces space heating demand by circa 214 MWh.

5.22 This generates a Total Regulated Energy Demand for the site of 283MWh, generating a **76% reduction** from baseline conditions.

5.23 Therefore, it is shown in the above calculations that the **FHS can be achieved** through building to higher levels of Fabric Energy Efficiency and installation of ASHPs to all dwellings across the Application site.

Energy Strategy

5.24 Table 5-3 above states that through integration of Fabric First Improments and Installation of Air Source Heat Pumps, total regulated energy demand is 283Wh.

5.25 This represents a 76% reduction from the 2013 Baseline established in Table 5-1.

5.26 Therefore, through these initiatives alone the 75% reduction in energy demand required through FHS can be achieved and excelled.

5.27 However, it is intended that the development proposals continue to explore and deliver further intiatives and technologies wherever feasible and practicable to ensure a holistically sustainable development is acheived.

Further Energy Demand Reduction Considerations

Solar Masterplanning

5.28 Solar masterplanning is a passive strategy for reducing energy demand across a development through optimising natural daylight, heating and cooling effects.

5.29 The masterplan, where possible from an urban design perspective, will be designed to optimise the solar gains through design. Units shall be aligned to maximise the solar gain with a minimum angle of 22 degrees to the south, with approximately a third maximising the solar gain, with an alignment of 44 degrees to the south.

5.30 Roofs of buildings shall be, where feasible, pitched for solar thermal/photovoltaic installation. PV is most efficient when positioned south facing at a pitch of 30-35 degrees from horizontal, limiting shading, according to the Energy Saving Trust.

5.31 Additionally, houses will benefit from solar heating and lighting through passive gains. Whilst it is not feasible to ensure all units achieve an east to west orientation, due to potential urban design requirements, it is still possible to provide renewable/solar panels to roofs running north to south and still benefit from renewable energy although at a reduced rate.

5.32 As well as orientation, consideration will be given to density and the potential for overshadowing.

5.33 These initiatives will allow for a circa **10% reduction** is space heating demand in the first instance before any further technologies are installed.

5.34 Therefore, solar masterplanning could reduce space heating demand by up to **14MWh** at the proposed development.

5.35 Through solar masterplanning, space heating efficiency is designed into the development, robustly ensuring space heating requirements are minimised and a carbon neutral development can be delivered alongside a number of other initiatives.

5.36 **Table 5-4** below shows the Total Regulated Energy Demand after ASHPs are installed and solar masterplanning is designed into the development.

5.37 Through solar masterplanning, a 79% reduction in Total Regulated Energy Demand can be achieved. This should be further explored at detail design stage.

Table 5-4: Predicted Energy Demand under FHS with integrated energy saving strategies and technology

Regulated Energy Demand Component	MWh
Space Heating	322
Solar masterplanning (10% reduction set out in point 5.33 above)	- 32
Installation of ASHP (3:1 ratio)	- 193 (Rounded saving)
Space Heating after integrated measures	97 (322 - 32 - 193 = 32)
Water heating	81
Lighting	66

Building Design: Energy Efficiency

5.38 The Energy Efficiency in Buildings Chartered Institution of Building Services Engineers (CIBSE) Guide F (2016) explains that building design should adopt energy efficiency lighting principles:

- *"Energy efficient lighting should:*
  - *Maximise natural daylight*
  - *Avoid unnecessarily high illuminance*
  - *Incorporate the most efficient luminaires, control gear and lamps*
  - *Include effective lighting controls"*

5.39 These principles should be used in the design of the proposed development in order to optimise natural daylight and reduce regulated energy demand.

5.40 Passive measures such as the above improve energy efficiency in a building, complying with the second stage of the hierarchy, 'better use of energy.'

5.41 Low energy, LED lighting will also further be developed as an active measure of integrating energy efficiency to deliver the development in a sustainable manner while targeting current Building Regulations requirements.

5.42 Measures will also be made to reduce lighting or illumination of any external part of the development.

5.43 No electrical cooling will be used, with the design of the building envelopes and specifically the windows carefully considered to ensure living spaces remain comfortable all year. Windows will be openable in all habitable rooms, allowing natural ventilation.

5.44 Dwellings will be serviced by a 3-phase electrical supply, which will both cope with the extra loadings from ASHPs and EVCPs, as well as allowing the full exploitation of any renewable technologies installed, including allowing for maximum feedback into the grid, as required.

6 Sustainability Strategy

6.1 The proposed development will seek to provide a cohesive, vibrant and safe neighbourhood for its inhabitants. To do this, the three principles of sustainability outlined in the NPPF will be addessed, ensuring the development is socially, environmentally and economically sustainable. This section will outline strategies to deliver this vision across the lifetime of the development in line with national and local policy.

Site Layout, Urban Form and Building for Life

6.2 All dwellings will meet national space standards.

6.3 The scheme will be designed in accordance with the Building For A Healthy Life (BfHL) Guidance, which replaced Building For Life 12 (BFL12). BfHL develops the principles set out in BFL12 further to provide an industry standard for well-designed homes and developments, encouraged by the UK Government and is referred to in the NPPF. The most recent BfHL sets out 12 criteria to assess how well proposals will provide sustainable places. Policy D1 requires that new developments include a checklist against these 12 criteria and perform positively against any recommendations within the BfHL guidance.

6.4 The accreditation is referenced in the NPPF as a tool for assessing proposals, and it utilises a 'traffic light system' to assess proposals.

6.5 Through a range of design measures, the proposed development will seek to provide a cohesive, vibrant and safe neighbourhood.

6.6 As discussed in the previous section, buildings will be designed to high standards to ensure energy efficiency and compliance with FHS.

Ease of Movement

6.7 Sustainable transport initiatives as to be delivered through the Travel Plan will lower the amount of carbon emitted to the environment in the first instance.

6.8 In line with Approved Document Part S of the Building Reuglations, each dwelling should be installed with EV charging points.

6.9 Additionally, the development will be designed to minimise walking distance and maximise accessibility of amenities, thus lowering demand for carbon emitting transportation.

6.10 The feasibility of installing electric bike charging facilities will be considered and integrated into the proposed development to encourage sustainable travel choices.

6.11 The design and layout of the proposed development shall take into account ease of movement, ensuring that the entire development is permeable to pedestrians, cyclings and other sustainable forms of transport.

Measures to Enable Sustainable Lifestyles

6.12 A number of measures will be integrated into the proposed development to ensure that it is diverse, inclusive and accessible to all residents in order to achieve social sustainability.

6.13 Social sustainability entails creating places that promote wellbeing through an understanding of the needs of residents from the places they live and work.

6.14 Measures to provide this include:

- High quality broadband connection
- Housing mix to reflect local needs and to be informed by the Strategic Housing Market Assessment (SHMA) and site considerations.
- Affordable housing in accordance with policy

Water Resources

6.15 There is a need to achieve the Building Regulations Approved Document Part G optional target of 110 litres per person per day, subject to change should national standards be updated.

6.16 Therefore, measures will be introduced to restrict water consumption to a theoretical maximum of 110 litres per day per person, an improvement on current Building Regulations Approved Document Part G of 125 litres per person per day. This could be achieved in the first instance through reducing water usage with water efficient fittings, such as delayed inlet valves and flow restrictors, and water efficient appliances, such as low flush toilets.

6.17 The average water consumption in England and Wales is reported to equate to 141 litres per person per day. On average Yorkshire Water customers daily water usage is reported to be 132 litres per person per day (Water UK; England and Wales, April 2016 – March 2017).

6.18 A water minimisation strategy will provide wider benefits to the local area by ensuring water demand is substantially reduced below the existing rates and that water resources can accommodate the demands of the development and surrounding area.

6.19 Water saving methods during the operational stage of the proposed development could be provided as:

- Greywater reuse
- Rainwater harvesting
- Aerated kitchen taps and shower heads
- Low-capacity baths
- Low flush toilets
- Shower timers
- Water efficient appliances such as washing machines and dishwashers

6.20 However, to achieve a holistically sustainable development, it is important that water usage is efficient during the construction phase too. This could include measures such as:

- Closed loop wheel washers
- High pressure, low volume power hoses
- Reuse of water where possible

6.21 Should it be deemed necessary, a completed *water efficiency for new dwellings* worksheet, provided within the Appendix of Building Regulations Approved Document Part G will be provided prior to occupation to demonstrate achievement of the maximum water usage of 110 litres/person/day.

6.22 Additionally, provision of Sustainable Urban Drainage Systems (SuDS) will reduce the volume and rate of surface water run-off from the proposed development.

6.23 The drainage strategy will employ storage methods where viable such as ponds, to attenuate flow, remove pollutants, and ensure that runoff to existing watercourses is restricted according to the existing hydrology of the Application Site. All SuDS elements will be sized to accommodate increased flows from potential future climate change. This is to be further considered as the detail for the proposed development progresses.

6.24 This 'blue infrastructure,' including detention basins and swales, will aid passive cooling of the urban area through creating a cooler microclimate.

Waste

6.25 A waste minimisation strategy will be developed for both the construction and occupational phases.

6.26 During the construction phase it is important that a Site Waste Management Plan (SWMP) is developed and adhered to, ensuring resource waste is minimised and waste is managed more effectively through promoting resuse, recycling and recovery of waste. A SWMP is a live document used to monitor waste and ensure a strategy for managing waste in the most sutainable way. This should be drafted at an early stage to influence the design of the proposed development and then reviewed and updated as the development progresses.

6.27 During the occupation phase, strategies to enhance ease of reuse and recyling will be put in place, such as providing facilities for recycling and waste storage.

6.28 A Materials Management Plan (MMP) should be created for the Application Site, to ensure all excavated material arisings are planned for, minimised, and sustainably and legally reused.

Landscaping: Efficient use of biodiversity and ecological resource

6.29 The proposals will provide comprehensive green infrastructure resource which will seek to protect and enhance where appropriate, the biodiversity of the existing habitats and ecology, including supporting locally native trees and shrubs, the details of which are contained within the ecological appraisal for the development. How the proposals can be implemented is shown indicatively on the submitted landscape plan.

6.30 This will provide a biodiversity net gain for the development, which means leaving biodiversity in a better state after development than before.

6.31 Green infrastructure is based on the principle that the protection and enhancement of nature is integrated with the development proposals. Integration of a comprehensive green infrastructure network will enhance sustainability through ensuring the efficient use of land due to their support of functioning ecosystems and natural systems of management for resources such as water, air and soil.

6.32 Green infrastructure vegetation also helps reduce the amount of atmospheric CO_2 through direct carbon sequestration, where carbon dioxide is captured and removed from the atmosphere via photosynthesis and further natural processes.

6.33 Therefore, these measures will contribute to the delivery of a sustainable development that minimises its environmental impact and influence on climate change.

Carbon Sequestering

6.34 Planting and landscaping methods will be further developed at the detailed design stage, through means such as green buffers around and throughout the Application Site development parcels. These measures will assist in providing for the shelter of buildings from prevailing cold winds in the winter, whilst providing the necessary shading in the summer without the loss of natural light, providing a natural cooling effect.

6.35 Additionally, green infrastructure aids carbon sequestration from the surrounding environment.

6.36 Carbon sequestering strategies shall be implemented across the proposed developmennt where feasible.

6.37 Carbon sequestering will be reviewed as the scheme develops to keep continuous monitoring of the overall impact of tree planting on the development.

7 Summary

7.1 This document sets out a sustainability strategy to be implemented at the proposed development at the Application Site, ensuring both national and local policy requirements are met in accordance with the NPPF and FHS, whilst adding value to the local area.

7.2 The proposed development will look to reduce energy demand through fabric improvements across all individual dwellings in compliance with the energy hierarchy in order to achieve a 75% reduction in energy demand set out in the FHS.

7.3 Initial calculations suggest that up to a 76% reduction can be achieved through fabric first improvements, solar masterplanning and installation of ASHPs to each dwelling. This exceeds the reduction necessary from the FHS and demonstrates that the inate flexibility of the FHS negates the need for a connection into a less efficient and more restrictive district heating system.

7.4 However, further initiatives will be explored, evaluated and integrated into the proposed development where feasible to ensure a robust sustainability strategy for the Application Site.

7.5 Further carbon emissions will be mitigated with carefully located PV Cells, Sustainable Transport Initiatives and Carbon Sequestering.

7.6 Proposals and initiatives set out within this report will reduce the greenhouse gas emissions through lowering demand while improving energy efficiency. Meanwhile, overall sustainability will be addressed through a multifaceted approach to water management, open space provision and ecological considerations, among other factors.

7.7 Ensuring compliance with current and emerging legislation will unlock a sustainable development that will result in tangible benefits to the environment and to occupiers of the development. Sustainable principles, underpinned by relevant national and local policy, will be embedded throughout all phases of development, inclusive of both the construction and operational phases.

7.8 The strategy outlined in the report sets out how the proposed development will have compliance with FHS and reduce carbon emmissions in line with national and local planning requirements.

8 Disclaimer

8.1 The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the Application Site.

8.2 Third party information has been used in the preparation of this report, which Brookbanks by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks accepts no liability for same.

8.3 The benefits of this report are provided solely to Ptarmigan Land North Ltd for the proposed development at Land at Hemingfield.

8.4 Brookbanks excludes third party rights for the information contained in the report.

Appendix A – Illustrative Masterplan

PTARMIGAN

Notes:

All Dimensions are to be verified on site before any work commences. If any discrepancies, errors or emissions are noted, these are to be reported to STEN Architecture immediately.

If any other drawings are referenced within this layout, please refer to the specific detailed drawing for design, materials and specific working practices.

1. PRIMARY VEHICULAR ENTRANCE FROM HEMINGFIELD ROAD
2. RETAINED WALKING ROUTE THROUGH THE CENTRE OF THE SITE AND CONNECTION TO THE NORTH. THIS ROUTE IS SET IN A PLEASANT GREEN CORRIDOR WITH THE POTENTIAL TO INCLUDE NEW NATIVE PLANTING AND TREES
3. RETAINED PUBLIC RIGHTS OF WAY (FOOTPATH 17 AND 18)
4. ATTRACTIVE GREENSPACE AT THE DEVELOPMENT ENTRANCE
5. PROPOSED DRAINAGE BASIN
6. FEATURE SPACES AND GATEWAY BUILDINGS
7. POTENTIAL ACCESS TO ADJACENT LAND
8. RETAINED HEDGEROW ALONG THE EASTERN BOUNDARY
9. DEDICATED WALKING ROUTE
10. PROPOSED EQUIPPED PLAY AREA

- DEVELOPMENT PARCELS
- FRONTAGE AND BUILT FORM
- KEY PEDESTRIAN ROUTES
- VEHICLE ROUTES
- REAR BOUNDARIES
- EXISTING SEWER AND EASEMENT (subject to detailed survey)

NB:-

A) Proposed Landscaping is shown indicatively and subject to detailed design and recommendations from Ecology, Landscape, and Arboriculture consultants.

B) Proposed highways and footpaths are shown indicatively. All streets and routes will comply with Local Authority Guidance.

- Primary Streets will mainly comprise 5.5m highway, flanked by 2m footpaths.
- Shared Surfaces will be a maximum overall width of 7.2m including appropriate service margins.
- Private Drives will be a maximum of 5.5m.

N

Scaled @ 1:1250

0 25m 50m 100m

STEN ARCHITECTURE

SITE: HEMINGFIELD, BARNSLEY			
TITLE: ILLUSTRATIVE MASTERPLAN			
SCALE AT A2: 1:1250	DATE: DEC 2023	DRAWN: SSH	CHECKED:
PROJECT NO: 2344	DRAWING NO: 2344:01		REVISION: C

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