



WHITECODE
CONSULTING

Sustainability Strategy

90 Walsworth Road, Hitchin

Prepared for MSAD Architectural Design Ltd

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Rev 01

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Executive Summary

This sustainability strategy has been prepared by Whitecode Consulting to satisfy the sustainability condition from the decision notice Ref: 25/00143/FP, for the site at 90 Walsworth Road, Hitchin.

It is completed inline with energy requirements for the site and the North Hertfordshire Local Plan (2011-2031)

The site description is as follows:

Erection of two storey rear extension incorporating undercroft parking and change of use of ground floor office (Class E) and alterations of first floor flat to provide three additional flats

This report shows how the scheme complies with the following condition 7:

Prior to the commencement of development, a site-wide sustainability strategy shall be submitted to the Local Planning Authority for approval addressing renewable energy, reducing carbon emissions and water conservation. The approved measures must be implemented on site for each dwelling hereby approved prior to its first occupation.

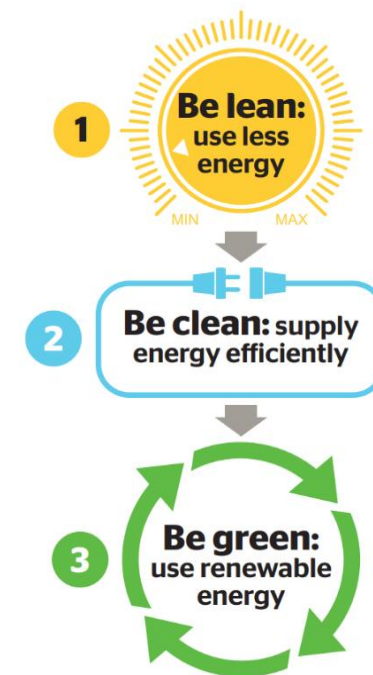
Reason: To reduce carbon dioxide emissions and promoting principles of sustainable construction and the efficient use of buildings in accordance with Policies SP9 and D1 of the North Hertfordshire Local Plan 2011 to 2031

The new build residential dwelling has been assessed against Part L1A 2021 of the Building Regulations using the Standard Assessment Procedure (SAP) 10.2 methodology. The three conversion dwellings will be aligned with Part L requirements for ‘material change of use’.

The strategy outlines the proposed energy strategy for the site following the energy hierarchy, prioritising a fabric first approach, low carbon heating and hot water and renewable technology.

Energy efficiency is the first stage of the energy hierarchy. Energy demand should be reduced as far as possible before the heating strategy and installation of low carbon and renewable technologies is considered. This is important in protecting consumers from high prices.

This report concludes that the proposed **residential** development will achieve a 52% improvement over Part L 2021 of the Building Regulations.



• **Be Lean** – improved building fabric specification to exceed that of the notional building, low air permeability target, thermal bridging details and selection of energy efficient services for the new build dwelling. Meeting minimum notional building targets for the converted dwellings.

• **Be Clean** – connection to a district heat network and installation of Combined Heat and Power (CHP) have been investigated for the site and not been deemed either available or appropriate at this time.

• **Be Green** – Highly efficient air source heat pump hot water cylinders are to be installed to each dwelling, as well as photovoltaic panels to ensure a minimum EPC rating of C

This report concludes that the proposed development will achieve a **44% improvement** over Part L 2021 of the Building Regulations.

The following table demonstrates the overall reduction in regulated carbon emissions of the development after each stage of the energy hierarchy.

	Carbon dioxide emissions (kg CO ₂ per m ²)
	Domestic
Baseline: Part L 2021 of the Building Regulations compliant development	49.08
After renewable energy (be green)	27.84
% carbon reduction	44%

Table 1: Site wide carbon savings

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1. Introduction

The purpose of this report is to show how the client can address the relevant sustainability condition for the proposed development located at 90 Walsworth Road, Hitchin.

1.1. National Planning Policy and Targets

The proposed development will be constructed to be compliant with Part L 2021 of the Building Regulations. The proposed development consists of new build dwellings, under Part L1A 2021 of the Building Regulations and converted dwellings under Part L1B 2021. They mandate that the design of the building demonstrably causes lower carbon dioxide (CO₂) emissions than a notional equivalent of given specifications.

The National Planning Policy Framework (NPPF) was updated in December 2024, which re-emphasises the Government's commitment to sustainable development and states the need for planning authorities to take an approach based on integrating the four aims of sustainable development. The document also refers to the Government's energy policies and objectives and sets out key principles that regional planning bodies and local planning authorities should adhere to in their approach to planning for renewable energy.

1.2. Local Planning Policies

The proposed development lies in North Hertfordshire, therefore, the applicable Local Planning Policy is the North Hertfordshire Local Plan (2011-2031),

The North Hertfordshire Local Plan, sets out long term energy and sustainability related standards for the Borough as follows:

- Policy SP9: Design and sustainability
- Policy D1: Sustainable Design

Developments will be required to demonstrate how the proposal minimises energy-related CO₂ emissions in accordance with the following:

- iii. Reduce energy consumption and waste

1.3 The Development

The Development is for the Erection of two storey rear extension incorporating undercroft parking and change of use of ground floor office (Class E) and alterations of first floor flat to provide three additional flats.

The dwelling has been modelled using the Standard Assessment Procedure (SAP) 10.2 methodology.



Figure 1.1 Proposed Site Plan

2 Baseline Energy Consumption & Carbon Emissions

An assessment of the sites potential energy use was conducted in compliance with the minimum requirements of Part L1A 2021 of the Building Regulations.

The energy assessment must first establish the regulated CO₂ emissions baseline assuming the development complied with Part L 2021 of the Building Regulations using Building Regulations approved compliance software.

Regulated energy is calculated as follows:

Dwellings: a Dwelling CO₂ Emissions Rate (DER) has been calculated through the Part L 2021 of the Building Regulations methodology SAP 10.2. A representative sample of dwellings have been selected to model covering all unit types, orientations and floor levels.

To determine the CO₂ emissions baseline, the Target Emission Rate (TER) is used.

Regulated carbon dioxide emissions (kg CO ₂ per m ²)	Domestic
Baseline: Part L 2021 of the Building Regulations compliant development	49.08

Table 2.1 Baseline carbon emissions

Approved Document L1A also includes the fabric energy efficiency (FEE) which is a measure of the amount of energy which would normally be needed to maintain comfortable internal temperatures and can be influenced by fabric U-values, thermal bridging, air permeability and thermal mass. This is for plot 3 only.

Fabric Energy Efficiency	kWh/m ²
Part L1A Target Fabric Energy Efficiency Rate (TFEE)	54.19

Table 2.2 Target fabric energy efficiency

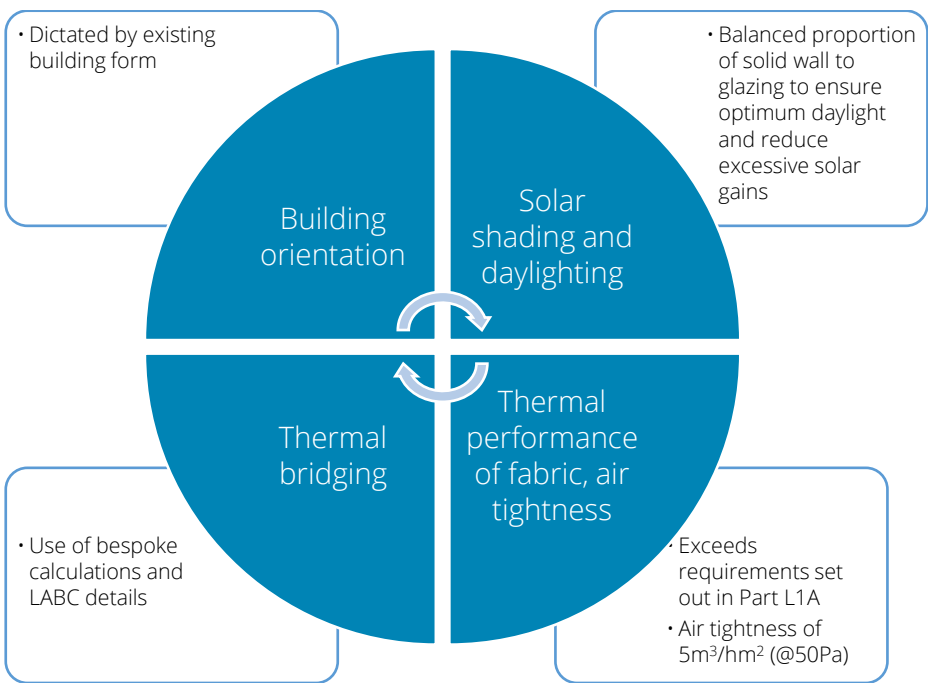
3 'Be Lean' – Energy efficient design

An assessment of the sites potential energy use was conducted in compliance with the minimum requirements of Part L1A 2021 of the Building Regulations.

Local planning guidelines require a reduction in the CO₂ emissions of the proposed scheme by energy-efficient measures. A number of energy-efficient measures are considered below.

3.1 Passive Design Measures

Passive design measures involve adapting building massing, layout and glazing to best respond to the local climate and annual sun path in order to reduce energy demands.



The table below shows the proposed building fabric against Part L of the Building Regulations. Approximately 50% of heat is lost through the fabric of a building. This includes walls, floors, windows, roofs and the thermal bridging connecting them. The remaining 50% is lost through uncontrolled ventilation through gaps around doors, windows, and any service penetrations.

Element:	Part L 2021 Limiting Values:	New build	Conversion
Floors	0.25 W/m ² K	0.12 W/m ² K	0.12 W/m ² K
External Walls	0.30 W/m ² K	0.17 W/m ² K	0.20 W/m ² K
Walls between apartments and corridors	0.30 W/m ² K	0.17 W/m ² K	0.20 W/m ² K
Party walls	0.00 W/m ² K	0.00 W/m ² K	0.00 W/m ² K
Roof	0.20 W/m ² K	0.10 W/m ² K	0.10 W/m ² K
Front Doors	2.00 W/m ² K	1.20 W/m ² K	1.20 W/m ² K
Windows	2.00 W/m ² K	1.40 W/m ² K	1.20 W/m ² K
Window g-value	N/A	0.63	0.63
Air Permeability Rate	10m ³ /hm ² (@50Pa)	5 m ³ /hm ² (@50Pa)	5 m ³ /hm ² (@50Pa)

Table 3.1 Proposed U-values

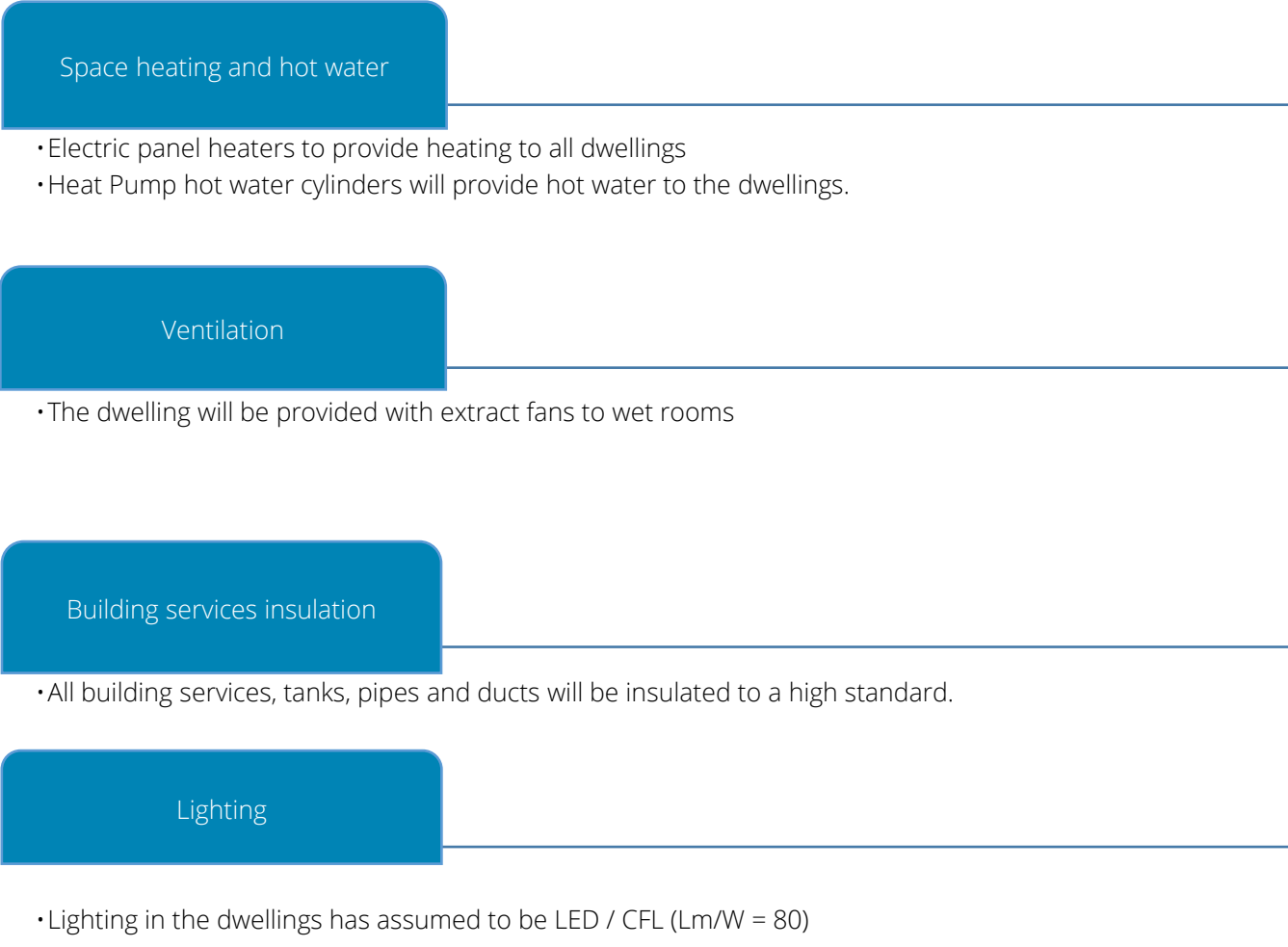
A thermal bridge, also called a cold bridge, is an area of a building construction which has a significantly higher heat transfer than the surrounding materials. This is typically where there is either a break in the insulation, less insulation or the insulation is penetrated by an element with a higher thermal conductivity. Where the building is situated in a cold climate (such as the UK) this can result in additional heat loss at these points.

Around 30% of the total heat loss through a building's fabric can be caused by thermal bridging. Indications are that better detailing and improved air tightness can reduce a dwelling's annual CO2 emissions by up to 10%.

This development will use a range of default construction details as well as bespoke calculations for the psi values.

3.2 Active design measures

After addressing the passive design measures the next step is to use energy efficient buildings services, lighting, and controls throughout the scheme to reduce fuel consumption.



4 Cooling due to potential summer overheating

4.1 Cooling hierarchy

The cooling hierarchy has been followed in order to reduce the demand for cooling. The following categories have been considered:

1. [Minimising internal heat generation through energy efficient design](#) – minimised heat distribution infrastructure within the buildings.
2. [Reducing the amount of heat entering the building during summer](#) – the location, proportion and specification of the glazing should aim to balance natural light and 'beneficial' solar gain whilst ensuring that levels of heat gain are not excessive.
3. [Use of thermal mass and high ceilings to manage heat within the building](#) – higher thermal mass construction enables heat to be absorbed in the day and then released at night, however a balance must be struck. Lightweight structures without the energy-absorption potential are often at risk of overheating.
4. [Passive ventilation](#) – providing openable windows to allow natural ventilation and night-time cooling to comply with Part F of the Building Regulations. Low temperature air from external is allowed into the building during the night and circulates throughout the building cooling the building fabric.
5. [Mechanical ventilation](#) - this can be used to make use of free cooling when the outside air temperature is below that in the building during summer months, through the use of a summer by-pass on the MVHR.

The scheme has been designed inline with the cooling hierarchy above and has been investigated for compliance with Part O for the new build property only (Plot 3), a dynamic simulation will be completed for this unit.

5 'Be Clean' – Heating Infrastructure

5.1 District Heating – Connection to existing scheme

The site has been investigated for connection to an existing or proposed heat network, in line with the heating hierarchy.

There are no local heat networks in the area for connection.

Due to the lack of an available network nearby connection to an existing district heating network was deemed unfeasible.

Instead of this, highly efficient Air Source Heat Pump hot water cylinders are proposed for the hot water for the building. This is explored in the 'Be Green' section.

5.2 'Be Clean' Results

Since there are no changes proposed, the 'be clean' results are identical to those at the end of the 'be lean' stage.

6 'Be Green' – Renewable Energy

6.1 Heat Pump hot water cylinders

An efficient heat pump mounted on top of the stainless-steel cylinder extracts heat from external air, drawn through insulated ductwork, to produce hot water as an alternative to direct electric immersion. Heat pump hot water cylinders combine the benefits of heat pumps with efficient water storage, providing a sustainable and cost-effective solution for heating water in homes.

6.2 Photovoltaic panels

PV systems convert energy from the sun into electricity via semi-conductor cells. There are a wide range of different panels available on the market, from less expensive amorphous silicon with low efficiencies to mono-crystalline silicon with much higher efficiencies (1kWp installation requires approximately 6m² of free roof area).

Ideally PV panels need to be positioned within 30° South and at an angle of 30° to achieve optimum performance. It is essential that PV panels are unshaded, as even a small amount of shading dramatically reduces the output of the panel. The applicant will be selecting high performance PV panels of at least 400 watts per panel.

There is sufficient space on the roof to provide an array of PV panels. Allowing space for access hatching as well as maintenance and avoiding areas of roof which are shaded by other blocks, the available roof area has been maximised. In order to be compliant with the minimum EPC rating of C, PV panels are required for all apartments. The PV will be directly connected to each dwelling to ensure that occupants receive the direct benefit to minimise energy bills.

The following PV is recommended:

Unit 1: 2.5kWp

Unit 2: 1.5kWp

Unit 3: 2kWp

Unit 4: 2kWp

6.3 'Be Green' Results

SAP calculations for the dwellings have been completed using the 'Be Green' specification of heat pump hot water cylinder and PV panels, to achieve a 44% carbon reduction on site.

	Carbon dioxide emissions (kg CO ₂ per m ²)
	Domestic
Baseline: Part L 2021 of the Building Regulations compliant development	49.08
After renewable energy (be green)	27.84
% carbon reduction	44%

Table 6.1 Sitewide carbon savings

7 Water conservation

Due to the effects of climate change, we are likely to see a change in UK summer temperatures and rainfall intensity leading to droughts and flooding. North Hertfordshire Local Plan policies seek to encourage new developments to consider the long-term impact of climate change and water as a precious resource and incorporate measures to mitigate any potential risks. There is a requirement to ensure the effective use of sustainable urban drainage and sustainable water management.

All residential developments should meet the technical standard for water efficiency of 125 litres per person, per day.

The water calculation in the table below shows how < 125 litres per head per day can be achieved. Residents will be metered on their water usage to encourage behavioural changes towards water use and make savings.

Fitting:	Flow Rate/Capacity:	Water Use (L/person/day):
WC	6/3 litres dual flush	8.88
Wash Hand Basin	5 litres/min	9.48
Bath	170 litres to overflow	18.70
Shower	10 litres/min	43.70
Kitchen Tap	5 litres/min	12.56
Washing Machine	Not specified	17.16
Dishwasher	Not specified	4.50
Calculated Use		115
Normalisation Factor		0.91
Total Consumption		117.6

Proposed residential water flow rates/capacities.

The development is wholly located in Flood Zone 1, which is defined as land having a less than 0.1% annual probability of river or sea flooding. There is also a low risk of flooding to the development from surface water, overland flows, groundwater and reservoirs.

8 Conclusion

This energy strategy outlines the key features and strategies adopted by the design team to reduce energy use and carbon emissions for the scheme. It demonstrates compliance with the building regulations Part L1, as well as the North Hertfordshire Local Plan.

The strategy for reducing energy and associated carbon emission follows the energy hierarchy:

- **Be Lean** – improved building fabric specification to exceed that of the notional building, low air permeability target, thermal bridging details and selection of energy efficient services
- **Be Clean** – connection to a district heat network and installation of Combined Heat and Power (CHP) have been investigated for the site and not been deemed either available or appropriate at this time.
- **Be Green** – Highly efficient heat pump hot water cylinder to be installed in the dwellings and PV panels to be connected to each unit

This report concludes that the proposed development at 90 Walsworth Road, will achieve a **44%** improvement over Part L1A 2021 of the Building Regulations.

The final specification to meet the 44% carbon reduction on site is as follows:

	Specification
	Domestic
Heating	Electric panel heaters
Hot water	Heat pump hot water cylinder e.g. Dimplex EDEL
Emitter	Panel heaters
Cooling	N/A
Ventilation	Extract fans
Lighting	100% low energy 80lm/cW
Renewables	PV panels – directly connected Unit 1: 2.5kWp Unit 2: 1.5kWp Unit 3: 2kWp Unit 4: 2kWp

Table 8.1 Summary of specification to meet the building regulations

Appendix A – SAP Outputs

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