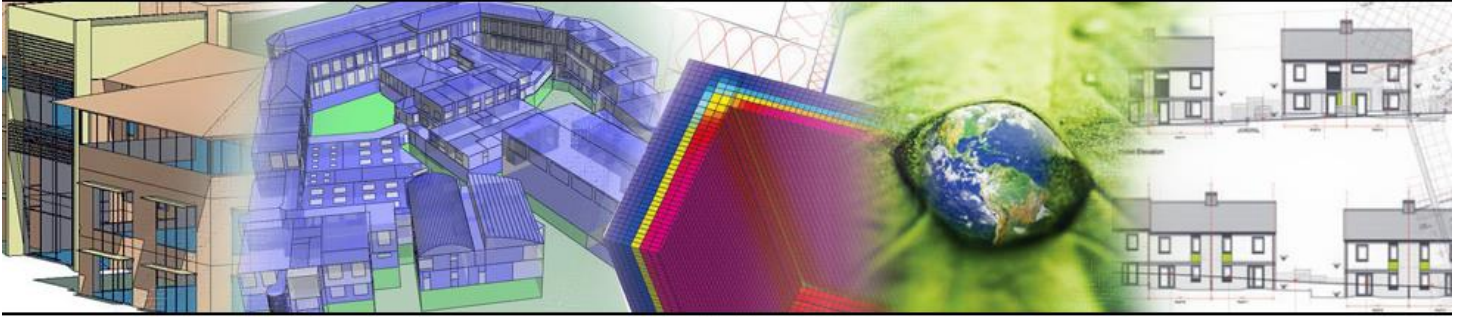




BUILT ENVIRONMENT
A PHENNA GROUP COMPANY



Energy Statement

Land at Bridge Farm, Twyford

Stroma Reference: OP-D320 ES1
Date: 29/11/2024
Prepared for: Croudace Homes Ltd

1. Executive Summary

This Energy Statement has been produced on behalf of Croudace Homes Ltd to support the reserved matters planning application for the proposed development of 200 dwellings at land at Bridge Farm, Twyford.

This report outlines how the proposed development meets Building Regulations 2021 Part L1A and the requirements of Wokingham Borough Council Core Strategy policies CP1, and CC04 and CC05 of the Managing Development Delivery Local Plan (Feb 2014), the Sustainable Design and Construction Supplementary Planning Document (2010).

The energy strategy will undertake a fabric first approach and incorporate renewable technology on-site via air source heat pumps which are a zero NOx solution at the source.

The below results show that the development can achieve a 60.33% reduction on the dwelling (carbon dioxide) emission rate (DER) against Target Emission Rate (TER) as defined in the 2021 Building Regulations.

1.1. Results Summary

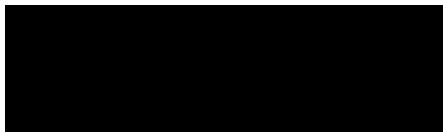
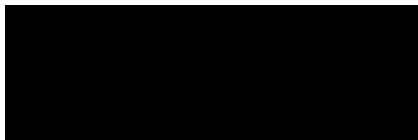
Predicted regulated carbon dioxide savings			
	Carbon dioxide emissions (Tonnes CO2 per annum)	Stage savings (Tonnes CO2 per annum)	CO2 reduction (%)
Baseline: Part L 2021 of the Building Regulations Compliant Development	227.71	–	–
Site Wide CO2 savings	90.34	137.37	60.33%

Table 1. Predicted site wide regulated annual carbon dioxide savings

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2. Quality Management

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File reference:	OP-D320 ES1		

Version	Status	Date	Change Summary
ES1	First Issue	29/11/2024	-



Registered office as above. Company reg. no. 4507219

3. Introduction

Stroma Built Environment has been commissioned on behalf of Croudace Homes Ltd to prepare an Energy Statement to support the reserved matters planning application for the proposed development of 200 dwellings at land at Bridge Farm, Twyford.

The proposed development is located within the village of Twyford in the Wokingham borough of Berkshire and will therefore need to meet the requirements of the policies CP1, and CC04 and CC05 of the Managing Development Delivery Local Plan (Feb 2014), the Sustainable Design and Construction Supplementary Planning Document (2010).

The energy strategy for the proposed development is as follows:

1. Minimal heat loss through fabric, thermal bridging and air infiltration.
2. Installation of air source heat pumps which are a zero NOx solution at the source.

4. Development Site

The development site is located within the village of Twyford in the Wokingham borough of Berkshire. The proposal consists of the development of 200 dwellings comprising a mixture of affordable and private 1-5 bedroom apartments, houses and maisonettes. The developments shall include and associated infrastructure, open space, biodiversity enhancements, landscaping and green infrastructure, following demolition of existing agricultural buildings.



Figure 1. Proposed site layout

5. Planning Policy

5.1. National Policy - England

The Department for Communities and Local Government (DCLG) released the National Planning Policy Framework (NPPF) in March 2021. In revising this framework, the Government's objective is to streamline the process encouraging sustainable development and promoting the needs and priorities of local communities.

This framework is to be used as the base by councils to develop their own local policy. Section 14 of the framework addresses climate change, flooding and coastal change. Considerations include:

- Minimising CO₂ emissions
- Vulnerability of fuel supply
- A promotion of decentralised, low carbon and renewable energy sources wherever viable

5.2. Wokingham Borough Council notification of approval of planning permission – Condition 41. Sustainability and energy efficiency

The reserved matters application for the development shall be accompanied by a sustainability and energy efficiency report to be approved in writing by the Local Planning Authority. The report shall include details to demonstrate how the development will achieve the sustainability targets of the Future Homes Standards. The development shall be carried out in accordance with the approved details and shall be installed and functional before first occupation of the buildings they are intended to serve.

Reason: In the interests of promoting sustainable forms of developments. Relevant Policies: Core Strategy policies CP1, and CC04 and CC05 of the Managing Development Delivery Local Plan (Feb 2014), the Sustainable Design and Construction Supplementary Planning Document (2010).

5.1. Policy CP1: Sustainable development

Planning permission will be granted for development proposals that:

- 1) Maintain or enhance the high quality of the environment;
- 2) Minimise the emission of pollutants into the wider environment;
- 3) Limit any adverse effects on water quality (including ground water);
- 4) Ensure the provision of adequate drainage;
- 5) Minimise the consumption and use of resources and provide for recycling;
- 6) Incorporate facilities for recycling of water and waste to help reduce per capita water consumption;
- 7) Avoid areas of best and most versatile agricultural land;
- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;
- 9) Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater);

- 10) Provide attractive, functional, accessible, safe, secure and adaptable schemes;
- 11) Demonstrate how they support opportunities for reducing the need to travel, particularly by private car in line with CP6; and
- 12) Contribute towards the goal of reaching zero-carbon developments as soon as possible by:
 - a) Including appropriate on-site renewable energy features; and
 - b) Minimising energy and water consumption by measures including the use of appropriate layout and orientation, building form, design and construction, and design to take account of microclimate so as to minimise carbon dioxide emissions through giving careful consideration to how all aspects of development form.

5.2. Policy CC05: Renewable energy and decentralised energy networks

- 1. Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged
- 2. Planning permission will only be granted for proposals that deliver a minimum 10% reduction in carbon emissions through renewable energy or low carbon technology where the development is for:
 - a) Schemes of more than 10 dwellings (gross), or
 - b) Non-residential proposals of more than 1,000 sq m gross floorspace.
- 3. Proposals for renewable energy and decentralised energy works, including wind turbines, must demonstrate that:
 - a) They are appropriate in scale, location and technology type;
 - b) Are compatible with the surrounding area, including the impact of noise and odour;
 - c) Do not have a damaging impact on the local topography and landscape;
 - d) There is no significant impact upon heritage assets, including views important to their setting;
 - e) In the case of wind turbines, take account of their cumulative effect and properly reflect their increasing impact on the landscape and on local amenity

6. Assessment Methodology

6.1. Building Regulations – England Approved Document Volume 1 Domestic

Approved document L1A – Conservation of Fuel and Power sets the standard for carbon emissions for new dwellings and was last revised in June 2022 (Part L: 2021). The properties will need to comply with the criteria set out in the document, as follows:

The predicted Dwelling Emission Rate of CO₂ emissions from dwellings (DER) are not greater than the Target Emission Rate (TER).

The fabric energy efficiency rates for the building shall be no greater than the target fabric energy efficiency rate.

The primary energy rate for the building shall be no greater than the target primary energy rate.

That the performance of dwellings as-built comply with the DER values achieved, including site testing that the 'air permeability' rate achieved is as per that specified, or better.

The necessary provisions for energy efficient operation of dwellings are put in place, including operation and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand.

6.2. Domestic (SAP 10.2)

The Standard Assessment Procedure (SAP 10.2) is the Government's approved methodology for assessing the predicted energy consumption and carbon dioxide emissions of new buildings. Results are derived in respect of floor area and consider energy use (kWh/m²/yr) and associated CO₂ emissions (kg.CO₂/m²/yr) from the following:

- Space heating
- Domestic hot water
- Ventilation
- Lighting
- Ancillary pumps and fans
- Energy generating technology

SAP calculations have been undertaken for all dwelling types, by a trained and accredited energy assessor using approved software, and applied to the number of dwellings across the site with results used to determine the predicted energy consumption and CO₂ emissions.

The SAP calculations (DER/TER, DFEE/TFEE & DPER/TPER calculations), for each dwelling type, have been provided within appendix A.

An indicative fabric and systems specification has been based upon information provided by Croudace Homes Ltd. Following the full detailed design analysis the SAPs for all plots will be carried out to verify the proposed savings can be achieved.

7. Energy Strategy

This section outlines the proposals for specifying building fabric and services beyond the requirements of Building Regulations (the baseline).

Fundamental to achieving energy efficiency in any new building is the specification of a thermally efficient building envelope. Passive design features such as high levels of insulation, designing to maximise solar gain and limiting heat loss through reduced air leakage are all proven techniques to reduce energy consumption and emissions. In addition, the use of enhanced thermal bridging details will help to minimise thermal bridging.

7.1. Building Fabric

An indicative fabric specification has been provided by Croudace Homes Ltd to meet the efficiency targets for Building Regulations 2021.

The following tables illustrate the proposed building fabric performance specification, with respect to the limiting values stipulated in Table 4.1 of Part L 2021. It is shown that the proposed specification represents a significant betterment of the minimum standards.

Element	Part L limiting U-value (W/m ² K)	Proposed U-value (W/m ² K)	% Improvement
Ground Floor	0.18	0.11	39%
Exposed Floor	0.18	0.14	22%
External Wall	0.26	0.17	35%
Semi exposed walls (solid)	0.26	0.22	15%
Semi exposed walls (cavity)	0.26	0.17	35%
Dormer Cheeks	0.26	0.19	27%
Stud walls to loft space	0.26	0.19	27%
Party Walls	0.20	0	100%
Roof – horizontal ceiling	0.16	0.11	31%
Roof – sloping ceiling	0.16	0.20	-
Dormer Roof	0.16	0.20	-
Solid Doors	1.6	1.00	19%
Glazed Doors/Windows	1.6	1.30	38%

Table 2. Proposed Building fabric specification

Element	Part L Maximum Permeability m ³ /(h.m ²) @50 Pa	Proposed Permeability m ³ /(h.m ²) @50 Pa	% Improvement
Air permeability	8	3.50	56%

Table 3. Building airtightness specification

7.2. Building Services

Space heating and domestic hot water (DHW) will be provided by air source heat pumps with hot water cylinders to each individual dwelling. Air source heat pumps (ASHP) extract heat from ambient air via a reversed refrigeration cycle. Heat is absorbed into an evaporator (outdoor unit) and increased via compression. This useful heat is transferred to the building via a refrigerant to provide space and/or water heating.

Although the system uses electricity, high Coefficient of Performances (COP) can be achieved resulting in overall CO₂ emissions and running costs below that of an efficient gas-fired boiler. The COP is a function of the difference between ambient air (source) temperature and output (flow) temperature.

Ventilation to all dwellings will be via a mechanical ventilation heat recovery system (MVHR). MVHR works by extracting moist and stale air from wet rooms in your home, it recovers the usually lost heat from the extracted air. It also supplies clean, filtered fresh air that is heated from the recovered warmth of the extracted heat.

Low energy lighting will be specified throughout. In line with building regulations this means each internal light fitting should have lamps with a minimum luminous efficacy of 75 light source lumens per circuit-watt. Typically, this will be achieved with LEDs or compact fluorescent lights and not low voltage Halogen variants.

Element	Specification
Heating	Air Source Heat Pump – Vaillant Arotherm Plus or equal and approved Flow temperature 45°C
Heating emitter	Radiators
Heating control	Programmer and at least two room thermostats (time and temperature controlled)
Domestic hot water	Hot water cylinder
Water consumption	≤105 litres/person/day
Internal fixed lighting	100% low energy lighting with a minimum luminous efficacy of 75 light source lumens per circuit-watt.
Ventilation	Mechanical ventilation heat recovery system (MVHR)

Table 4. Building services specification

8. Water Efficiency

Building Regulations Approved Document Part G: 2015 states that new dwellings must meet conservation targets by limiting projected water usage in a dwelling to 110 l/p/p/day including a 5 l/p/p/day allowance for external water use however Wokingham Borough Council are now seeking 105 l/p/p/day. This can be achieved through the use of water efficient fittings such as flow restrictors and water efficient appliances.

A range of options will be evaluated, and those presented below represent one way of delivering the required result: they are not finalised, but there is a commitment to achieve the total consumption, by this or another combination of specifications.

Type of fitting/appliance	Flow rate/Water Consumption
W/C	Dual flush - 4 litres (full)/ 2.6 litres (Part)
Taps (excluding kitchen)	4 litres/min
Bath	170 litres capacity (to overflow)
Shower	8 litres/min
Kitchen Taps	6 litres/min
Washing Machine	Default figure (8.17 litres/kg)
Dishwasher	Default figure (1.25 litres/place setting)
Water Softeners	None
Greywater Recycling	None
Rainwater Harvesting	None
Total Consumption	104.90/p/p/ day

Table 5. Standard sanitary specification to achieve 105 l/p/p/day

9. Conclusion

This report outlines how the proposed development meets Building Regulations 2021 Part L1A and the requirements of Wokingham Borough Council Core Strategy policies CP1, and CC04 and CC05 of the Managing Development Delivery Local Plan (Feb 2014), the Sustainable Design and Construction Supplementary Planning Document (2010).

The energy strategy will undertake a fabric first approach and incorporate renewable technology on-site via air source heat pumps which are a zero NOx solution at the source.

Water consumption by occupants of each new dwelling does not exceed 105 litres per person per day.

The below results show that the development can achieve a 60.33% reduction on the dwelling (carbon dioxide) emission rate (DER) against Target Emission Rate (TER) as defined in the 2021 Building Regulations.

9.1. Results Summary

Predicted regulated carbon dioxide savings			
	Carbon dioxide emissions (Tonnes CO2 per annum)	Stage savings (Tonnes CO2 per annum)	CO2 reduction (%)
Baseline: Part L 2021 of the Building Regulations Compliant Development	227.71	–	–
Site Wide CO2 savings	90.34	137.37	60.33%

Table 6. Predicted site wide regulated annual carbon dioxide savings

Appendix A **SAP** calculations