

Sustainability and Energy Statement

Land at Sandgate Nurseries, West End Lane, Henfield

Prepared by Ivan Ball

Bluesky Unlimited
39 Marsh Baldon
Oxfordshire
OX44 9LP

ivan@blueskyunlimited.co.uk

16th January 2023



Table of Contents

Executive Summary	3
1.0 Introduction	4
2.0 Planning policies	5
3.0 Assessment methodology	8
4.0 Proposal	8
5.0 Energy Efficiency	9
5.1 Demand Reduction (Be Lean)	9
• Passive design measures	
• Active design measures	
5.2 Establishing Baseline Carbon Dioxide Emissions	12
• SAP calculation	
• BRUKL calculation	
5.3 Low-Carbon and Renewable Technologies (Be Clean and Be Green)	14
5.4 Summary of Calculations and Proposals for Low-carbon & Renewable Technologies	17
6.0 Climate Change Adaption and Water Resources	18
• Sustainable drainage systems (SuDs)	
• Water efficiency measures	
7.0 Materials and Waste	20
 Appendix 1: Regulations Compliance Report for the Modelled Unit based on Heat Pumps	

Executive Summary

This Sustainability and Energy Statement has been prepared in support of an outline planning application for the erection of a continuing care retirement community of up to 72 units of accommodation (Use Class C2) and up to 10 starter homes (Use Class C3) with associated community facilities including medical centre and on-site laundry and catering facilities, with access, infrastructure, open space, landscaping and associated works (all matters reserved except for access) on land Sandgate Nurseries, West End Lane, Henfield.

The detailed design has not been completed but in order to calculate the emissions from the site and hence demonstrate compliance with the planning policy SAP calculations have been prepared for houses of a similar scale and design to those envisaged based upon the construction specification set out within the report and the assumed accommodation schedule. When aggregated across similar unit types the calculations provide an assessment of the likely carbon dioxide emissions arising from the buildings and have allowed different systems to be tested.

The fabric insulation standards and the construction specification of the houses and associated community building will exceed the minimum required by the Building Regulations.

It is proposed to install air source heat pumps into all houses and the community building to provide space heating and hot water to all accommodation from renewable technologies.

There will be no on-site carbon dioxide or nitrous oxide emissions.

The carbon dioxide emissions and the reductions from the installation of air source heat pumps can be summarised as follows;

	Total Emissions	% Reduction
	kg CO ₂ per year	
Baseline Emissions (Building Regulations TER)	75,117	
Emissions after energy efficiency and ASHPs (DER)	27,591	63.27%

The water efficiency measures incorporated within the houses will ensure the water consumption is less than 85 litres per person per day and achieves the standard required by Natural England for development sites located in the Sussex North water supply zone.

The proposals meet the requirements of the planning policy.

1.0 Introduction

This report has been commissioned by Stonegate and provides a Sustainability and Energy Statement in support of an outline planning application for the erection of a continuing care retirement community of up to 72 units of accommodation (Use Class C2) and up to 10 starter homes (Use Class C3) with associated community facilities including medical centre and on-site laundry and catering facilities, with access, infrastructure, open space, landscaping and associated works (all matters reserved except for access) on land at Sandgate Nurseries, West End Lane, Henfield.

The report describes the methodology used in assessing the development and the initiatives proposed.

The houses and community building will be designed and constructed to reduce energy demand and carbon dioxide emissions.

The objective is to reduce the energy demand to an economic minimum by making investments in the parts of the buildings that have the greatest impact on energy demand and are the most difficult and costly to change in the future, namely the building fabric.

Once cost-effective structures have been designed, low-carbon and renewable technologies have been considered to provide further emissions reductions.

The following hierarchy has been followed:

- Lean reduce demand and consumption
- Clean increase energy efficiency
- Green provide low carbon renewable energy sources

The report has been prepared by Ivan Ball of Bluesky Unlimited who are sustainability consultants.

2.0 Planning Policy Context

National Policy

The UK Government published its sustainable development strategy in 1999 entitled “A better quality of life: A strategy for sustainable development in the UK”. This sets out four main objectives for sustainable development in the UK:

- Social progress that recognises the needs of everyone.
- Effective protection of the environment.
- Prudent use of natural resources.
- Maintenance of high stable levels of economic growth and employment.

Sustainable Communities: Building for the Future, known colloquially as the Communities Plan was published in 2003. The Plan sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas. It aims to tackle housing supply issues in parts of the country, low demand in other parts and the quality of our public spaces. The Communities Plan describes sustainable communities as: Active, inclusive and safe, well run, environmentally sensitive, well designed and built, well connected, thriving, well served and fair for everyone.

The most relevant national planning policy guidance on sustainability is set out in:

- National Planning Policy Framework - 2021

Paragraph 152 states;

“The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.”

Local Policy

Horsham District Council

The local planning policy is provided by the Horsham District Planning Framework, which was adopted in November 2015. The document replaces the Core Strategy and General Development Control Policies documents, which had been adopted in 2007.

The following policies are relevant to this Statement and may have been edited for clarity and specific relevance.

Policy 35

Strategic Policy: Climate Change

Development will be supported where it makes a clear contribution to mitigating and adapting to the impacts of climate change and to meeting the district's carbon reduction targets as set out in the Council's Acting Together on Climate Change Strategy, 2009.

Measures, which should be used to mitigate the effects of climate change include;

- 1. Reduced energy use in construction;*
- 2. Improved energy efficiency in new developments, including influencing the behaviour of occupants to reduce energy use;*
- 3. The use of decentralised, renewable and low carbon energy supply systems;*
- 4. The use of patterns of development which reduce the need to travel, encourage walking and cycling and include good accessibility to public transport and other forms of sustainable transport; and*
- 5. Measures, which reduce the amount of biodegradable waste sent to landfill.*

Development must be designed so that it can adapt to the impacts of climate change, reducing vulnerability, particularly in terms of flood risk, water supply and changes to the district's landscape. Developments should adapt to climate change using the following measures:

- 1. Provision of appropriate flood storage capacity in new building development;*
- 2. Use of green infrastructure and dual use SuDS to help absorb heat, reduce surface water runoff, provide flood storage capacity and assist habitat migration;*
- 3. Use of measures, which promote the conservation of water and/or grey water recycling;*
- 4. Use of site layout, design measures and construction techniques that provide resilience to climate change (opportunities for natural ventilation and solar gain).*

If it is not possible to incorporate the adaption and mitigation measures proposed, an explanation should be provided as to why this is the case.

Policy 36

Strategic Policy: Appropriate Energy Use

Energy hierarchy

All development will be required to contribute to clean, efficient energy in Horsham based on the following hierarchy:

1. *Lean – use less energy – e.g. through demand reduction*
2. *Clean – supply energy efficiently – e.g. through heat networks*
3. *Green – use renewable energy sources*

Energy Statements

All applications for residential or commercial development must include an Energy Statement demonstrating and quantifying how the development will comply with the Energy Hierarchy.

Policy 37

Sustainable Construction

Proposals must seek to improve the sustainability of development. To deliver sustainable design, development should incorporate the following measures where appropriate according to the type of development and location:

1. *Maximise energy efficiency and integrate the use of decentralised, renewable and low carbon energy;*
2. *Limit water use to 110 litres/person/day;*
3. *Use design measures to minimise vulnerability to flooding and heatwave events;*
4. *Be designed to encourage the use of natural lighting and ventilation;*
5. *Be designed to encourage walking, cycling, cycle storage and accessibility to sustainable forms of transport;*
6. *Minimise construction and demolition waste and utilise recycled and low-impact materials;*
7. *Be flexible to allow future modification of use or layout, facilitating future adaptation, refurbishment and retrofitting;*
8. *Incorporate measures, which enhance the biodiversity value of development.*

All new development will be required to provide satisfactory arrangements for the storage of refuse and recyclable materials as an integral part of design.

3.0 Assessment Methodology

The baseline carbon dioxide emissions from the buildings have been established using assumed building specifications and an assumed accommodation schedule for the development.

SAP calculations have been prepared for similar houses to those proposed, which have been used to estimate the total emissions from the homes. A BRUKL calculation for similar accommodation to the community building has been used to estimate the emissions from the non-residential unit.

Emission Factors

The CO₂ emission factors, where applicable, used throughout this report have been taken from the Building Regulation Approved Document L - 2021.

	kg CO ₂ /kWh
Grid supplied and displaced electricity	0.136
Mains gas	0.210

4.0 Proposal

The application seeks outline consent and detailed drawings have not been prepared for the dwellings or the community building.

However, in order to estimate the emissions from the site it is necessary to make assumptions about the type of units proposed. The energy strategy within this Statement has been based on the following, assumed accommodation schedule.

Unit Type	Number	Area	Total Area
		m ²	m ²
Residential Accommodation			
2-Bedroom Semi-detached houses (C2)	10	74.0	740
2-Bedroom Semi-detached houses (C3)	21	74.0	1,554
2-Bedroom Semi-detached houses (C3)	22	82.0	1,804
3-Bedroom Semi-detached houses (C2)	14	89.0	1,246
3-Bedroom Semi-detached houses (C2)	15	93.0	1,395
Sub-Total	82		6,739
Non-Residential Accommodation			
Community Building	1	300.0	300
Sub-Total			300
Total			7,039

5.0 Energy Efficiency

5.1 Demand Reduction (Be Lean and Be Clean)

Design

The energy performance of a building is affected by its design, construction and use and whilst occupant behaviour is beyond the remit of this statement, better design and construction methods can significantly reduce the life cycle emissions of a building and assist the occupant to reduce consumption.

Sustainable design is not just about incorporating renewable technologies; buildings should be designed at the outset to provide suitable environmental conditions for the occupants whilst also consuming as little energy as practical.

Passive Solar Gain

Passive measures include allowing for natural ventilation and exposed thermal mass coupled with high levels of insulation, air tightness and the control of solar gain.

The indicative Site Layout shows the majority of dwellings are positioned generally with either a northwest and southeast orientation or a southwest and northeast orientation. This maximises the benefit from solar gain and there are no homes with a solely northerly outlook.

All homes have access to direct sunlight at some point throughout the day.

Natural Daylighting

The orientation and the size of the windows have been optimised to maximise the amount of natural daylight and therefore reduce the demand for artificial lighting.

Efficient Building Fabric

Building Envelope

U-values of the building envelope must meet Building Regulations Part L standards and further improvements to U-values will reduce the building's heating requirements.

The modelling has been based upon the use of traditional load-bearing construction with external walls built with 100mm internal block, 150mm fully filled cavities and 100mm brickwork externally.

Ground floors will be insulated with 150mm 'Quinn Therm insulation or similar and roofs (lofts) with 450mm of mineral wool insulation comprising 150mm between joists and 300mm over.

Windows are proposed as double glazed with Low 'e' soft coat and argon filled.

It is proposed to set maximum limits for the elemental U-values as follows:

Element	Part L Limiting U-values	Proposed U-values	Proposed Improvement
	W/m ² K	W/m ² K	
Ground Floors	0.18	0.13	28%
External Walls	0.26	0.19	27%
Party Walls	0.20	0.00	100%
Roofs	0.16	0.10	38%
Windows	1.60	1.20	25%
External Doors	1.60	1.00	38%
'g' Value for Glazing	0.63		

Air Leakage

Large amounts of heat are lost in winter through air leakage from a building (also referred to as infiltration or air permeability) often through poor sealing of joints and openings in the building.

The Building Regulations set a minimum standard for air permeability of 8 m³ of air per hour per m² of envelope area, at 50Pa. The homes and community building will target a 50% improvement over Building Regulations and will seek to achieve a permeability of 4.0 m³/hr/m² or better.

Thermal Bridging

The significance of Thermal Bridging, as a potentially major source of fabric heat losses, is increasingly understood. Improving the U-values for the main building fabric without accurately addressing the Thermal Bridging is no longer an option and will not achieve the fabric energy efficiency and energy and CO₂ reduction targets set out in this strategy.

The buildings will use the thermal details formulated by the Concrete Block Association, which will enable the buildings to achieve the higher energy efficiency requirements of the Building Regulations.

The bridging losses have been based upon the following values;

Reference	Location	PSI Value
		W/mK
E2	Other Lintels (including other steel lintels)	0.058
E3	Sill	0.036
E4	Jamb	0.023
E5	Ground Floor (Normal)	0.064

E6	Intermediate Floor within a Dwelling	0.002
E10	Eaves (Insulation at Ceiling Level)	0.051
E14	Flat Roof	0.032
E16	Corner (normal)	0.038
E17	Corner (inverted)	-0.061

Ventilation

As a result of increasing thermal efficiency and air tightness, Building Regulations Approved Document F was also revised in 2021 to address the possibility of overheating and poor air quality. The ventilation to any En-Suites and Bathrooms will be comprised of continuous extract ventilation as per System 3 criteria. This reduces the number of external penetrations required to the building envelope.

Active Design Measures will include;

Efficient Lighting and Controls

Throughout the scheme natural lighting will be optimised.

Approved Document L1 requires internal light fittings to have lamps with a minimum luminous efficacy of 75 light source lumens per circuit-watt.

Space Heating and Hot Water

It is proposed to install air source heat pumps to all buildings. The SAP and BRUKL modelling has been based upon the installation of Vaillant aroTHERM air source heat pumps although other makes of heat pumps will make marginal changes to the emissions calculations.

5.2 Establishing Carbon Dioxide Emissions

The application is for outline consent and detailed design of the dwellings and the community building has not been completed. Therefore, in order to estimate the total site emissions and the reduction from the proposed specification, SAP and BRUKL calculations for similar accommodation have been used.

Residential

SAP calculations have been prepared for a 2-bedroom semi-detached unit 82.0 m², which are proposed as representative of all residential units.

The calculations have been based on the installation of air source heat pumps to all houses.

The Regulations Compliance Report is attached as Appendix 1 but the target dwelling emissions rate (TER) and actual dwelling emissions rate (DER) can be summarised as follows;

Unit Type	TER Emissions	DER Emissions
	kg CO ₂ /yr	kg CO ₂ /yr
Semi-detached, 2-storey house (82.0 m ²)	10.47	3.52

Non-Residential Accommodation

Community Building	CO ₂ TER	CO ₂ BER
	kg/m ² /yr	kg/m ² /yr
Total	15.2	12.9

Total Site Carbon Dioxide Emissions

Using the above results, the emissions can be aggregated across similar unit types to arrive at the total site emissions as follows;

	Area	CO ₂ TER	CO ₂ DER
	m ²	kg/yr	kg/yr
Residential Accommodation			
Semi-detached houses	6,739	70,557	23,721
Sub-Total		70,557	23,721
Non-Residential Accommodation			
Community Building	300	4,560	3,870
Sub-Total		4,560	3,870
		75,117	27,591

The total emissions allowable through the Building Regulations (TER) are calculated as:

- **75,117 kg CO₂ per year**

With total actual site emissions (DER) assessed as:

- **27,591 kg CO₂ per year**

The site carbon dioxide emissions are reduced by 47,526 kg CO₂ per year as a result of the energy efficiency measures and the installation of air source heat pumps into all buildings, which equates to a reduction of 63.27% of the TER emissions.

5.3 Low-Carbon and Renewable Technologies (Be Clean and Be Green)

The carbon dioxide emissions established above have been used to test the viability of various renewable and low carbon technologies as follows. This section determines the appropriateness of each renewable technology.

The Government's Renewable Obligation defines renewable energy in the UK. The identified technologies are;

- Small hydro-electric
- Landfill and sewage gas
- Onshore and offshore wind
- Biomass
- Tidal and wave power
- Geothermal power
- Solar

The use of landfill or sewage gas, offshore wind or any form of hydroelectric power is not suitable for the site due to its location. The remaining technologies are considered below;

Wind

Wind turbines are available in various sizes from large rotors able to supply whole communities to small roof or wall-mounted units for individual dwellings.

The Government wind speed database predicts local wind speeds at West End Lane to be 4.9 m/s at 10m above ground level and 5.7 m/s at 25m above ground level. This is below the level generally required for commercial investment in large wind turbines. In addition the land take, potential for noise and signal interference make a large wind turbine unsuitable for this development.

Roof mounted turbines could be used at the development to generate small but valuable amounts of renewable electricity but the small output and contribution to total emissions means any investment would be small and purely tokenism. In addition the use of wind turbines will have a detrimental aesthetic impact on the appearance of the development.

Combined Heat and Power and Community Heating

Combined heat and power (CHP) also called co-generation is a de-centralised method of producing electricity from a fuel and 'capturing' the heat generated for use in buildings. The plant is essentially a small-scale electrical power station.

The production and transportation of electricity via the National Grid is very inefficient with over 65% of the energy produced at the power station being lost to the atmosphere and through transportation.

CHP units are generally gas fuelled and generate electricity with heat being a by-product. The heat is usually used to meet the hot water load, which is fairly consistent throughout the year.

Historically CO₂ savings have been achieved because gas has been used to generate electricity and gas has had a lower emissions factor than electricity. However, with the de-carbonisation of the electricity grid the benefit of CHP is negated.

CHP is not proposed.

Ground Source Heat Pumps

Sub soil temperatures are reasonably constant and predictable in the UK, providing a store of the sun's energy throughout the year. Below London the groundwater in the lower London aquifer is at a fairly constant temperature of 12° C. Ground source heat pumps (GSHP) extract this low-grade heat and convert it to usable heat for space heating.

GSHP operates on a similar principle to refrigerators, transferring heat from a cool place to a warmer place. They operate most efficiently when providing space heating at a low temperature, typically via under floor heating or with low temperature radiators.

Whilst the houses are set in private garden areas it is unlikely there will be sufficient external ground area to sustain a horizontal collection system and the installation of ground source heat pumps is likely to require the use of a bore hole collection system to each house.

The use of ground source heat pumps with bore-hole collection systems to the houses is feasible but would be an expensive option when compared with some other technologies and therefore the installation of GSHPs is not proposed.

Solar

(i) Solar Water Heating

Solar hot water panels use the sun's energy to directly heat water circulating through panels or pipes. The technology is simple and easily understood by purchasers.

Solar hot water heating panels are based generally around two types, which are available being 'flat plate collectors' and 'evacuated tubes'. Flat plate collectors can achieve an output of up to 1,124 kWh/annum (Schuco) and evacuated tubes can achieve outputs up to 1,365 kWh/annum (Riomay).

Panels are traditionally roof mounted and for highest efficiencies should be mounted plus or minus 30 degrees of due south. Evacuated tubes can be laid horizontally on flat roofs but flat plate collectors are recommended for installation at an incline of 30 degrees. It is assumed solar panels could reduce the energy demand of the hot water requirements by 50%.

Assuming panels could be installed to all houses and assuming the panels would reduce energy demand by 50% the installations would reduce the total site energy demand by **36,705 kWh per year**.

When combined with the reduction from other measures the total reduction in emissions, if solar hot water panels were installed would be **69.91%** of the total (TER) emissions.

Solar hot water heating panels could be used but the relatively small increase in the total emissions reduction does not justify the cost of the installations when compared with other technologies.

Solar hot water heating panels are not proposed.

(ii) Photovoltaics

Photovoltaic panels (PV) provide clean silent electricity. They generate electricity during most daylight conditions although they are most efficient when exposed to direct sunlight or are orientated to face plus or minus 30 degrees of due south.

PV panels can be integrated into many different aspects of a development including roofs, walls, shading devices or architectural panels. The panels typically have an electrical warranty of 20-25 years and an expected system lifespan of 25-40 years.

Whilst the installation of photovoltaic panels to the dwellings is feasible, subject to the roof configurations and orientations the use of heat pumps to all units already reduces emissions significantly.

Photovoltaic panels are not proposed.

Air Source Heat Pumps (ASHP)

Air sourced heat pumps operate using the same reverse refrigeration cycle as ground source heat pumps, however the initial heat energy is extracted from the external air rather than the ground. These heat pumps can be reversed to provide cooling to an area although this reduces the coefficient of performance of the pumps.

The proposal for the houses and the community building includes the installation of air source heat pumps to meet the space heating and hot water demand.

5.4 Summary of Calculations and Proposals for Low-carbon and Renewable Technologies

The total emissions from the site based upon the maximum permissible by the Building Regulations (TER) are calculated as **75,117 kg CO₂ per year**, with actual (DER/BER) emissions after energy efficiency measures and the installation of heat pumps of **27,591 kg CO₂ per year**.

Whilst the local planning policy encourages sustainable design there are no specific targets for emissions reductions either from energy efficiency or from renewable technologies.

However, the Applicant is keen to develop a sustainable and energy efficient scheme and the specification has been formulated to achieve a large reduction in emissions compared to the Building Regulation maximum.

Various technologies are considered above and whilst wind turbines, combined heat and power, ground source heat pumps and solar hot water heating panels are not appropriate the installation of air source heat pumps are considered feasible and appropriate. Whilst not proposed, photovoltaic panels could be considered at the detailed design stage to further reduce emissions.

Be Green

The construction standards proposed include U-values, which demonstrate good practice and improve upon those required by the Building Regulations. Air tightness standards are targeted at a 50% improvement upon the minimum required by the Building Regulations.

It is proposed to install air source heat pumps to all buildings, which will provide the space heating and hot water to all accommodation from renewable technologies. There will be no on-site carbon dioxide or nitrous oxide emissions.

The reduction in emissions as a result of the fabric specification and systems installed in the dwellings are **47,526 kg CO₂ per year**, which equates to a reduction of **63.27%**.

6.0 Water Use Statement

In the South East of England, water demand exceeds the volume licensed for abstraction, with the shortfall being met from ground water. In excess of 20% of the UK's water is used domestically with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.

The amount of potable water used within buildings can be reduced by using fixed fittings, which reduce water use in WC's, taps and showers.

The site falls within the Sussex North water supply zone. In September 2021 Natural England published a Position Statement for applications within the area. This requires developments to be water neutral to enable sufficient water to be available for the region as a whole. Natural England have confirmed they are developing a water neutrality strategy with the relevant local authorities in the area but have provided an interim approach for demonstrating water neutrality. This requires;

Minimising water use of new builds.

- *Complete a water budget (based on occupancy)*
- *All new builds to demonstrate that they can achieve strict water targets (e.g., 85L/pp/day*)*
This can be achieved by measures such as:
 - *Grey water recycling (advantage of being reliable in hot dry weather);*
 - *Rainwater harvesting;*
 - *Water efficient fixings (such as shower aerators) to demonstrably reduce demand-this would need to be suitably certain.*

In addition, water offsetting is required

- *One way to achieve this is retrofitting of council owned properties/commercial buildings-located within Sussex North. Examples include:*
 - *Grey water recycling- (for example there are clear opportunities for commercial properties).*
 - *Rainwater harvesting of commercial settings;*
 - *Installation of water reduction fittings in Council-owned buildings.*

These measures need to be implemented until such time as a more sustainable water supply has been secured.

It will also need to be ensured that measures are not already proposed (for example in Southern Water's Management Plan) to avoid double-counting.

Any mitigation must be suitably certain in order to comply with the Habitats Regulations and Caselaw.

A water consumption target for the dwellings of less than 85 litres/ person/ day will be achieved.

Water efficient devices will be fully evaluated, and installed to all units. The specification of such devices will be considered at detailed design stage and each will be subject to an evaluation based on technical performance, cost and market appeal, together with compliance with the water use regulations.

Water consumption calculations have been carried out for the dwellings using the Water Efficiency Calculator provided by the BRE. This calculator gives an indication of the probable water use in a dwelling, although this is largely dependent on the way on which occupants use their homes.

Below is a typical specification, which would achieve the 85 Litres per person per day target (including five litres per person per day allowance for external water use).

Schedule of Appliance Water Consumption		
Appliance	Flow rate or capacity	Total Litres
WC	4/2.6 litres dual flush	7.09
Basin	2.5 litres/min.	5.53
Shower	7.5 litres/min	32.78
Bath	149 litres	16.39
Kitchen Sink	3.5 litres/min	11.90
Washing Machine	5.26 litres/kg	11.68
Dishwasher	0.73 litres/places	2.44
		87.81
	Normalisation Factor	0.91
Total Internal Water Consumption		79.91
External Water Use		5.00
Total Water Consumption		84.91

With regards to offsetting; this requires further engagement with the local authority.

7.0 Materials and Waste

The BRE Green Guide to Specification is a simple guide for design professionals. The guide provides environmental impact, cost and replacement interval information for a wide range of commonly used building specifications over a notional 60-year building life. The construction specification will prioritise materials within ratings A+, A or B.

Preference will be given to the use of local materials & suppliers where viable to reduce the transport distances and to support the local economy. A full evaluation of these suppliers will be undertaken at the next stage of design.

In addition, timber would be sourced, where practical, certified by PEFC or an equivalent approved certification body and all site timber used within the construction process would be recycled.

All insulation materials to will have a zero ozone depleting potential

Construction waste

Targets will be set to promote resource efficiency in accordance with guidance from WRAP, Envirowise, BRE and DEFRA.

The overarching principle of waste management is that waste should be treated or disposed of within the region where it is produced.

Construction operations generate waste materials as a result of general handling losses and surpluses. These wastes can be reduced through appropriate selection of the construction method, good site management practices and spotting opportunities to avoid creating unnecessary waste.

The Construction Strategy will explore these issues, some of which are set out below:

- Proper handling and storage of all materials to avoid damage.
- Efficient purchasing arrangements to minimise over ordering.
- Segregation of construction waste to maximise potential for reuse/recycling.
- Suppliers who collect and reuse/recycle packaging materials

Appendix 1 – Regulations Compliance Report for the Modelled Unit based on Heat Pumps

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 10 program, Version: 1.0.0.37
Printed on 16 January 2023 at 11:20:36

Project Information:

Assessed By: Bluesky Unlimited

Building Type: Semi-detached House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 82m²

Site Reference : Sandgate Nurseries, Henfield

Plot Reference: 2BH SEMI 82

Address :

Client Details:

Name: Stonegate

Address :

This report covers items included within the SAP calculations.

It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Electricity

Fuel factor: 1.55 (electricity)

Target Carbon Dioxide Emission Rate (TER)

10.47 kg/m²

Dwelling Carbon Dioxide Emission Rate (DER)

3.52 kg/m²

OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)

39.9 kWh/m²

Dwelling Fabric Energy Efficiency (DFEE)

39.6 kWh/m²

OK

1c TPER and DPER

Target Primary Energy Requirement (TPER)

39.1

Dwelling Primary Energy Requirement (DPER)

38.8

OK

2 Fabric U-values

Element

Average

Highest

External wall

0.19 (max. 0.30)

0.19 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.13 (max. 0.18)

0.13 (max. 0.70)

OK

Roof

0.10 (max. 0.16)

0.10 (max. 0.35)

OK

Openings

1.18 (max. 1.60)

1.20 (max. 3.30)

OK

Roof lightsNaN (max. 2.20)

OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals

4.00 (design value)

Maximum

8.0

OK

4 Heating efficiency

Main Heating system:

Heat pumps with radiators or underfloor heating - electric
Vaillant aroTHERM 5kW

Regulations Compliance Report

Secondary heating system: None

5 Cylinder insulation

Hot water Storage:	Measured cylinder loss: 1.20 kWh/day	
	Permitted by DBSCG: 2.06 kWh/day	OK
Primary pipework insulated:	Yes	OK

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	Cylinderstat	OK
	Independent timer for DHW	OK
Boiler interlock:	Yes	OK

7 Low energy lights

Minimum luminous efficacy of 75 (lm/W)	75.0 (lm/W)	
		OK

8 Mechanical ventilation

Not applicable

9 Summertime temperature

Overheating risk (South East England):	Slight	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: North West	1.44m ²	
Windows facing: North West	0.5m ²	
Windows facing: South East	7.14m ²	
Windows facing: South East	2.16m ²	
Windows facing: South East	1.44m ²	
Windows facing: North West	2.16m ²	
Windows facing: North West	0.63m ²	
Windows facing: North East	0.63m ²	
Ventilation rate:	4.00	
Blinds/curtains:	None	

10 Key features

Doors U-value	1 W/m ² K
Roofs U-value	0.1 W/m ² K
Party Walls U-value	0 W/m ² K