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ENERGY/SUSTAINABILITY STATEMENT

ENGINEERING EXCELLENCE

PROPOSED CARE HOME

PERSEVERANCE STREET, BARNSLEY

DATE: 31/05/23

VERSION: 1.0

REF: 23-017 Exemplar Perseverance Street Barnsley Energy Statement Rev 1.0.docx

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VERSION HISTORY

Version	Status	Date	Description
1.0	Planning	31/05/23	For Planning Application

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1.0 INTRODUCTION

This report has been prepared to address energy efficiency, sustainable and renewable energy requirements set out within planning requirements.

The development consists of the erection of a care home with associated parking and landscaping.

Energy reduction/ renewables statement. This statement will show the predicted energy demand of the proposed development and the degree to which the development meets current energy efficiency standards.

The following were considered when formulating the report.

U-values
Design Stage BER/TER - Building Regulations Part L2A 2021
Energy efficiency technologies included
Renewable and low carbon technologies included
Percentage of low energy lighting
Reduced glazing areas

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2.0 SUSTAINABLE DESIGN

2.1 Enhanced U-value Specification

The building fabric, the building services and the management of a building broadly determine the energy use of a building. In understanding this, the design team can take measures to advance sustainable design from the earliest stages of a development.

The details below provide a summary of potential measures that can be incorporated into the design and construction of the development to reduce its energy requirement and carbon footprint. Within the Energy Hierarchy these measures are classified as lean, clean and green and permanently reduce the energy requirement.

Part L2A 2021 of the building regulations approved document sets minimum u-value standards as indicated below which are now lower than previous regulations Part L2A 2013, resulting in new buildings being more energy efficiency than they were previously:

Part L2A 2013

Walls	0.35 W/m^{2}k
Floor	0.25 W/m^{2}k
Roof	0.25 W/m^{2}k
Windows/Doors	2.20 W/m^{2}k

Part L2A 2021

Walls	0.26 W/m^{2}k
Floor	0.18 W/m^{2}k
Roof	0.18 W/m^{2}k
Windows/Doors	1.6 W/m^{2}k

The following 'U' values will be targets for the construction of various elements:

Proposed

Walls	0.26 W/m^{2}k
Floor	0.18 W/m^{2}k
Roof	0.15 W/m^{2}k
Windows/Doors	1.4 W/m^{2}k

These levels are to be achieved by the use of carefully selected materials to reduce the carbon signature.

The construction of the building is based on well insulated cavity walls, solid concrete floors and highly insulated roof. With the underfloor heating the building heats up and retains heat within the fabric and thermostatic controls steadily reduce the need to heat due to the thermal storage capacity of the building fabric, reducing energy/electric consumption.

2.2 Internal Lighting

Not less than 100% of light fittings to be used will be low energy LED fittings.

Control of lighting shall be via manual and also presence detection where deemed suitable.

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2.3 External Lighting

All external light fittings will be 40 Watt or less low energy lighting units which are designed to only accept low energy bulbs and fittings will be operated by dusk to dawn sensors to ensure limited use of energy.

2.4 Energy Efficient Technologies

Heating
Heating to the majority of the development shall be via a centralised low temperature hot water heating system.

The heat to this system shall be provided via Air Source Heat Pumps (ASHP) with seasonal efficiencies of 335%.

These ASHPs provide heating via low carbon methods as well as being highly efficient.

This central system shall feed an underfloor heating system to the majority of areas.

Local temperature controllers with locked parameters shall be installed to stop over heating.

Central controls shall also be provided giving better management of the building.

Heating/Cooling – Lounge Areas
Heating & cooling to lounge areas shall be provided via efficient heat pump air conditioning units. These shall provide both thermal comfort and also energy efficient operation.

Control of the units shall be via local controllers with locked parameters to stop over heating/cooling.

Hot Water
Hot water shall be provided via high efficiency, low NO_x gas fired water heaters.

Ventilation
All extract ventilation shall be via local 'Lo Carbon' type, low specific fan power. These units shall run continuously at a low speed and boost via an integral humidity sensor when required providing enhanced ventilation.

Water Consumption
Sanitaryware shall all provide lower water consumption than required by building regulations.

Photovoltaic
Photovoltaic (PV) Panels shall be installed east facing to provide renewable energy, reducing the carbon footprint of the building.

2.5 Glazing Areas

Glazing areas have been lowered, reducing heat losses (and heating loads) and also removing any possible overheating issues.

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2.6 Design Stage BRUKL (TER/DER) Calculation

The proposed building was modelled in SBEM 2021 to determine the CO_2 emissions. Simplified Building Energy Model, or SBEM, is the government's approved methodology for the calculation of CO_2 emissions for new buildings.

These calculations incorporate details included above to calculate envisaged CO_2 emissions of the development. These results are shown below and within Appendix A:

TER	9.52 $kgCO_2/m^2$/annum
BER	9.46 $kgCO_2/m^2$/annum

These calculations show that with the development emissions are below that required for the current building regulation requirements (SBEM 2021) and show a reduction in CO_2 of in excess of 45% compared to the previous requirements of SBEM 2013.

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3.0 CONCLUSION

The energy strategy was detailed previously but can be best summarised as follows:

- A fabric first strategy which aims to achieve long term reductions in CO_2 emissions and climate change has been incorporated.
- Heating will be provided via high efficiency ASHPs.
- Hot water will be provided via high efficiency gas fire water heaters.
- PV shall be provided on the east facing roof.
- All lighting shall be LED.
- The emissions rates are lower than that required by the current building regulations.
- Glazing areas are lowered to reduce heat loss and possible overheating issues.

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APPENDIX A

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BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Exemplar, Perseverance Street, Barnsley — As designed

Date: Wed May 31 11:44:58 2023

Administrative information

Building Details

Address: Exemplar, Perseverance Street, Barnsley,

Certifier details

Name: Mark Iles

Telephone number:

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: Energy Simulator

Interface to calculation engine version: 10.10.0.199

BRUKL compliance module version: v6.1.d.0

Foundation area [m²]: 711

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	9.52	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	9.46	
Target primary energy rate (TPER), $kWh/m^2.annum$	102.36	
Building primary energy rate (BPER), $kWh/m^2.annum$	101.75	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Wall 1
Floors	0.18	0.11	0.18	Exposed Floor 1
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	Exposed Roof 1
Windows** and roof windows	1.6	1.4	1.4	Window 1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.4	1.4	Door 1 (Personnel Door)
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.
^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	6

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