

## **Sustainability and Energy Strategy Statement**

### **Proposed new dwelling :**

Plot 1  
87 Queenshill Road  
Knowle  
Bristol  
BS24 2XQ

Report and SAP Calculations prepared by -

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On behalf of P Rhodes

Report Dated – 28<sup>th</sup> February 2023.

### **Introduction**

The aim of this report is to demonstrate the developer's intentions in response to the requirements of the Climate Change and Sustainability policy BCS14 regarding energy demand and carbon emissions reductions.

To demonstrate how the development can reduce its Carbon Emissions technical SAP calculations were undertaken.

The policy requires the completion of Energy Strategies Summary Table and a copy of this is also provided

The Full SAP reports include the details required for completion of the Summary Table. The pertinent details are located on page 4/5 sections 12a line 272 and Section 13a line 286. These reports are also provided.

The SAP BREL Compliance reports for the Baseline and the Co2 % reduction versions are provided. The Compliance Reports illustrate the calculations achieving the Building Regulation compliance as required. Both the Baseline SAP calculations and the Co2 % reduction SAP calculations have adopted the most up to date version (SAP10) as directed in the Bristol City Council practice note of July 2020

Please refer to the Application drawings submitted with the planning application for all dimensions.

## **Building Regulations to illustrate improvements**

Baseline energy demand and regulated Co2 emissions have been produced to be Building Regulation compliant to the current regulations as per Climate Change and Sustainability practice note July 2020 without renewable energy technology. These have been recalculated with renewable technology to identify improvements to the energy demand and Co2 emissions. Attached is the SAP report for the Baseline SAP calculation.

## **Energy efficiency**

A hierarchy of minimising energy requirements and controlling what is used to support this by incorporating renewable energy technology. The new Building Regulations that came into force on the 15th of June 2022 have increased the requirement for all thermal elements to be improved on in comparison to the previous version. A dwelling produced under the new regulation SAP calculation needs to be 31% (on average) more efficient than one produced in the previous version of the Building Regulations SAP calculation.

With the decarbonisation of electricity production the ability to adopt Electric as an energy source for the dwelling has resulted in the adoption of an Air Source Heat Pump (ASHP). This will supply all heating and hot water to the dwelling. ASHP are significantly more efficient than a mains gas boiler. The adoption of an ASHP results in the reduction of carbon emissions and improves the ability to pass the SAP requirements without the need of compensating for an energy source (Mains Gas) with a higher carbon emissions factor.

## **Energy Efficient Thermal Elements**

The proposed Thermal Elements and other controlled elements will meet and improve on the requirements of the Building Regulation. Below is a table identifying improvements to minimum limiting parameters.

## **Thermal Elements & Controlled Fittings**

<b>Element</b>	<b>Limiting Fabric Parameters U Values</b>	<b>Designed dwelling U Values</b>
Ground Floor	0.18	0.13
External Walls	0.26	0.18
Party Wall	0.20	0.0
Roofs	0.16	0.11
Windows	1.6	1.2
Doors	1.6	1.0
Air Pressure Test	8.0	5.75

To minimize heating loss (and therefore energy loss) through thermal bridges ie. where a wall meets a roof, we have adopted a combination of default values and the reference values dictated in the L1 Building Regulation. This will reduce the heat loss through these areas and increase the dwellings efficiency.

## **Heating Systems**

Heating will be provided by an ASHP. Heating will incorporate a complete control system appropriate to the system including time & temperature zone control, and fully lagged and insulated pipework.

Hot Water storage will be in an insulated cylinder with the insulation achieving a measured loss in KWh per day appropriate to the size (In litres) of the chosen cylinder.

## **Lighting**

Lighting will be low energy for all outlets. The new L1 regulations requires that all lighting must have a 75 lumens per circuit watt or higher. The calculations have adopted this requirement.

## **Ventilation**

Ventilation will be provided by low energy intermittent fans to all wet areas. This will reduce the potential for condensation build up whilst intermittent fan will reduce the electricity usage to the minimum required. All ventilation will meet or improve on the minimum specific fan power required. The calculations have adopted this requirement

To further improve energy efficiency by limiting non controlled ventilation an Air Pressure Test target of 5.75 has been adopted. This is below the minimum requirement of 8.0.

## **Conclusion**

### **20% Co2 reduction though Renewable Technology**

To achieve the 20% reduction in Carbon Emissions several renewable technologies have been considered for the development (solar thermal pv, wind, GSHP and biomass). The chosen option is detailed below with reasons as to why it was the most appropriate.

#### **Photo Voltaic Solar panels (PV)**

The buildings will utilise PV panels with plans to install an array to achieve 0.9 Kilo Watt Peak. This is deemed the most appropriate as electricity has the highest CO2 emissions factor. As an ASHP will be the energy source the PV will assist in the reduction of costs and emissions. The ability to situate the panels on a beneficial orientation also contributed to the choice. This option will enable the dwelling to achieve the minimum 20% saving as required without the need in the redesign of the preferred heating option.

