

# Sustainability Statement

Dundry Barn  
Dundry Lane  
Bristol  
BS41 8JQ



This Sustainability Statement forms one of the main supporting documents to this planning application. It provides key information about the proposals. Furthermore, this Sustainability Statement should be read in conjunction with the application forms, plans, site survey and all other supplementary documents submitted as part of this planning application.

LAWRENCE DUCK  
ARCHITECTURE

## **1.0 Introduction**

This planning application proposes the conversion of an agricultural building in Dundry Lane, North Somerset to 1 No. dwelling (Class C4).

This sustainability statement, submitted in support of the planning application, demonstrates how the design of the proposed development addresses the various issues that contribute to sustainable development. A review of national, regional and local planning policies has been undertaken, with particular emphasis on the 2019 National Planning Policy Framework (NPPF) and the 2017 North Somerset Core Strategies.

This sustainability statement forms one of the main supporting documents to this planning application and should be read in conjunction with the Design and Access Statement as well as other supplementary reports.

## **1.1 Site and Context**

The site is located within Dundry Parish in North Somerset and is situated approximately 0.8 miles north-west of Dundry Village and 6 miles south-west of Bristol city centre.

The site is accessed via Dundry Lane which itself is accessed from the A38. Dundry Barn is set far back from the roadside and is very well screened by dense vegetation that mostly conceals the existing development from sight.

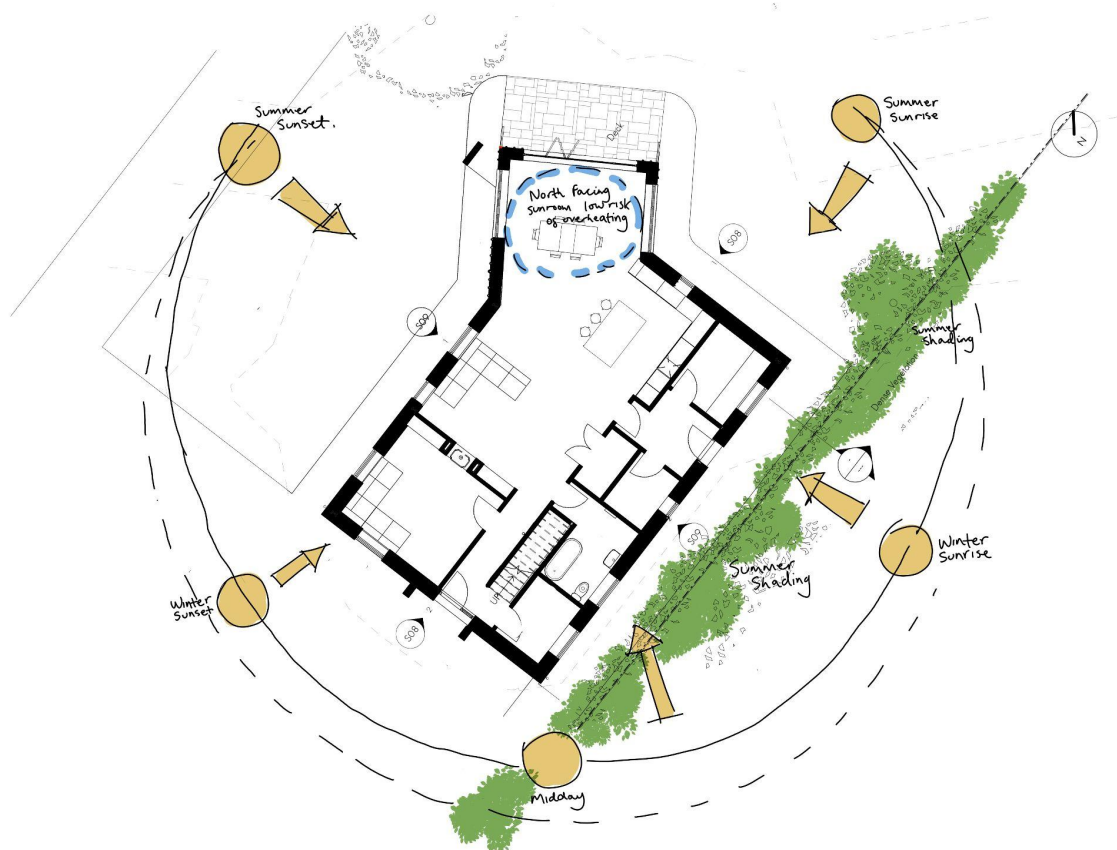
## 2.0 Creating Sustainable Buildings and Places in North Somerset

The need to design and operate sustainable dwellings is a high priority in order to mitigate the effects of climate change. To ensure compliance with Core Policies CS1: Addressing Climate Change and Carbon Reduction, and CS2: Delivering Sustainable Design and Construction, we have reflected on:

- BREEM UK New Construction 2018 Environmental Assessment Method
- North Somerset SD29 Creating Sustainable Buildings and Places in North Somerset

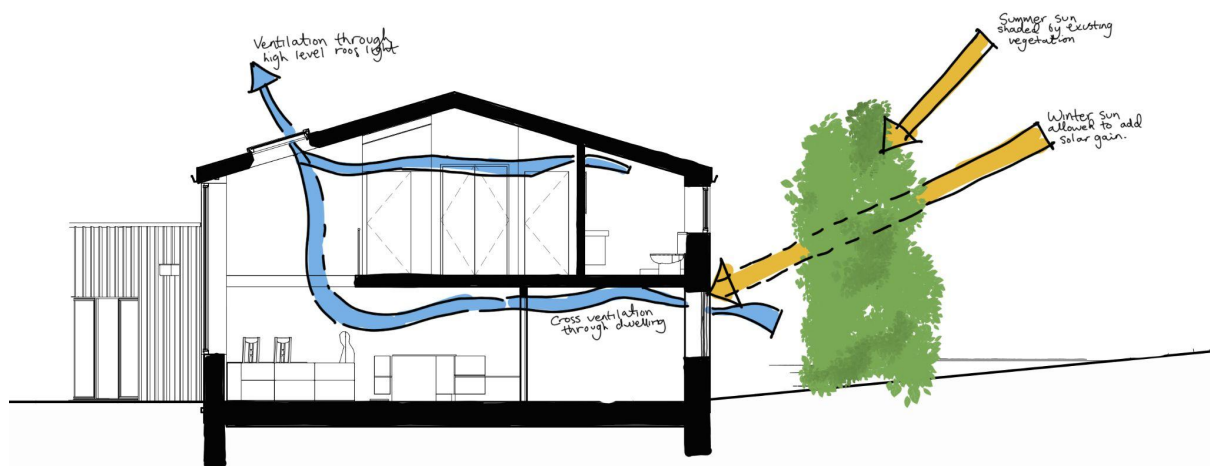
## 2.1 Siting, Orientation & Passive Design

The orientation and layout of the dwelling in combination with passive design principles will reduce the occupational energy consumption over the course of the building's lifetime.



Windows are situated to maximise passive heating and lighting and to provide natural ventilation. Rooflights will provide a source of passive heating and lighting as well as a way to naturally ventilate the building of excessive heat during warmer conditions as shown in the sectional diagram below.

The south east and south west façades have selective areas of glazing to allow for passive heating whilst minimising the risk of overheating the building. Summer sun is shaded by the large amount of vegetation on the south side, but during winter when the leaves have dropped the sun can shine in and heat the building. The large area of glazing on the north facing extension allows for a brightly lit living space with minimal risk of overheating.



A sectional diagram of the proposed dwelling exploiting its orientation and siting.

The double height space in the main open plan living area allows for high levels of natural cross ventilation, serving all of the ground floor and first floor rooms. This will be particularly useful in the summer months, when conserving heat within the dwelling is less important.

## 2.2 Renewable Energy Generation

In line with North Somerset Core Strategy CS2: Clause 2: 10% of the predicted energy demand will be met through renewable or low carbon sources.

The installation of an air source heat pump will provide space heating and hot water to the dwelling. This results in lower CO2 emissions compared to gas or other heating methods. This will work effectively in conjunction with the underfloor heating system proposed for the dwelling.

A wood burner will be installed in the lounge which will further provide heating to this space. Heat will also be recovered from the mechanical ventilation system.

### 2.3 Building Fabric & Materials

The approach to building fabric will follow passivhaus principles, meaning that a highly insulated and airtight building envelope will reduce heat loss and energy demand. This will result in the building fabric meeting or exceeding the minimum stated in Part L. An overview of the targets can be seen in the table below.

Building Fabric	Part L Requirement	Dundry Barn Target
Roof	0.13 W / (m <sup>2</sup> /k)	0.12 W / (m <sup>2</sup> /k)
Wall (exterior)	0.18 W / (m <sup>2</sup> /k)	0.16 W / (m <sup>2</sup> /k)
Floor	0.13 W / (m <sup>2</sup> /k)	0.12 W / (m <sup>2</sup> /k)
Glazing	1.40 W / (m <sup>2</sup> /k)	1.40 W / (m <sup>2</sup> /k)

Comparison of u-value targets between design proposal and Building Regulations Part L

The existing steel structure will be retained and infilled with a timber studwork and insulation system, which will be overclad with sheathing and a rigid insulation board, supporting the timber cladding system. The construction of the north facing extension will follow similar principles, using instead metal cladding as the external finish.

The airtightness of the interior is also proposed to be more efficient than that stated in Part L of the Building Regulations. The improved internal airtightness will work in conjunction with a mechanical ventilation with heat recovery to exhaust stale air and bring fresh air into the dwelling.

Air Permeability	Part L Requirement	Dundry Barn Target
m <sup>3</sup> / (h.m <sup>2</sup> ) at 50 Pa	10.0m <sup>3</sup>	3.00m <sup>3</sup>

Windows and roof lights will be doubled glazed, argon filled, and have low-emissivity coatings to reduce heat gain in summer and reduce heat loss in winter.

### **3.0 Sustainable Occupancy**

A sustainable occupancy is also key to reducing the carbon footprint of a dwelling and reducing the building's environmental impact. Some ways in which this can be achieved are noted below.

#### **Water Use**

In the UK, the average person uses approximately between 120 – 150 litres of water a day for a range of uses. In order to reduce demand for potable water, the following actions will be implemented:

- All W.C.s fitted with dual low flush cisterns
- Sanitary fixtures will be aerated to limit water flow to no more than 8 litres/minute
- Water butts installed to capture rainwater for garden use

#### **Waste**

A 180 litre refuse bin, recycling boxes and a waste food caddy will be stored within the curtilage of the site. A kerbside space will also be allocated for collection by the local waste management organisation. A food waste disposer may also be installed at the end user's discretion.

#### **Lighting**

Low-energy fitting used throughout the property to minimise energy consumption