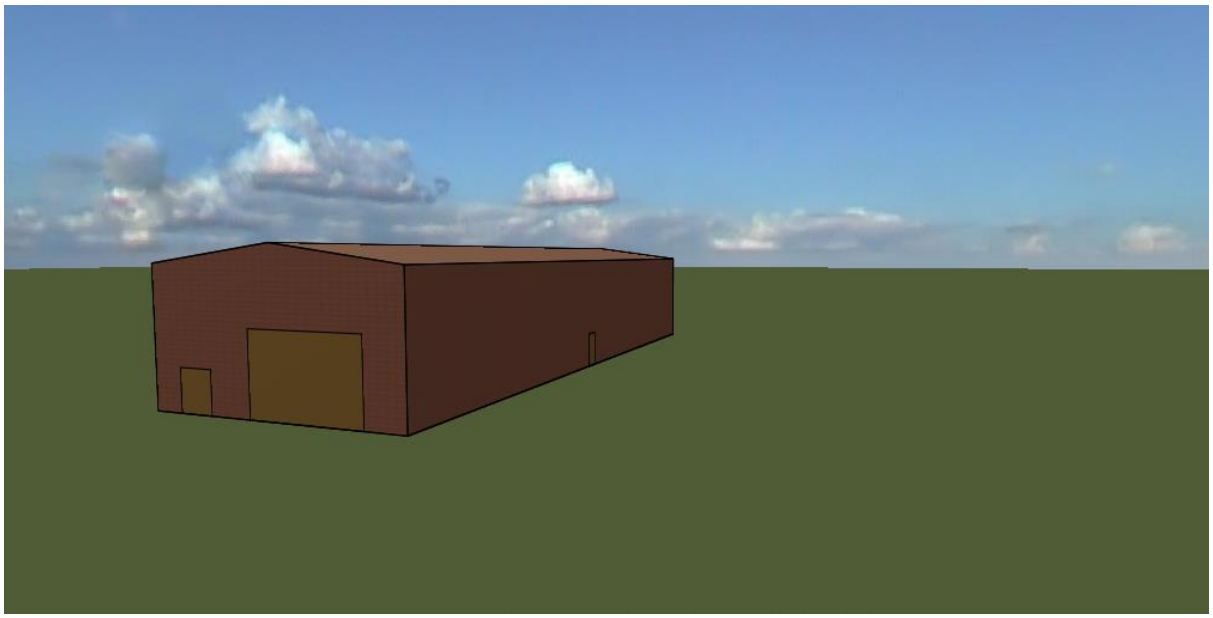
JCP
Consulting Engineers

Pulborough Garden Centre - Warehouse

Sustainability Statement



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Document History

Date	Rev	Comments
28.05.2021	-	Preliminary Issue
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INDEX

1.0 Introduction

JCP Consulting Engineers have been appointed by British Garden Centre's to provide a sustainability statement for a new warehouse located at Pulborough Garden Centre.

The sustainability statement has been produced to supplement the planning application for the proposed warehouse and focuses on the Energy Efficiency and Carbon Emissions aspect of the development whilst providing brief overview of further sustainable items associated with the development.

The proposed warehouse is situated North East of the existing Garden Centre.

2.0 Standards

The proposed new building will be designed in accordance with all current legislations and to meet the requirements of South Downs National Park Authority, specifically Strategic Policy SD48: *Climate Change and Sustainable Use of Resources*.

The building has been simulated using industry approved dynamic thermal modelling software (IESVE) to predict energy demand and carbon dioxide emissions, to assist with confirming that a sustainable approach has been taken.

Item 4. of policy SD48 requires the new building to minimise contribution to, and provide resilience from, the predicted impacts of climate change. In accordance with the Energy Performance of Building Directive, the building regulations Approved Document Part L2A 2013, stringent requirements for carbon dioxide emissions and solar gain limits are provided. The building, as proposed is in accordance with the following sections and fully complies with the requirement of regulations.

3.0 Energy Efficiency & Carbon Emissions

In response to Policy SD48 a 'Lean, Mean, Green' approach has been adopted by the design team when considering the building fabric and building services for the proposed warehouse at Pulborough Garden Centre.

- Lean Building – Optimise the building form, orientation and building fabric to ensure the building is as energy efficient as possible.
- Mean Building – Optimisation of the building services performance, utilising a good design and high efficiency systems.
- Green Building - Ensuring the most appropriate Low and Zero Carbon (LZC) technology is selected.

This hierarchical approach is also known as a fabric first approach, this is used to ensure buildings are designed to reduce energy usage by enhanced thermal performance and utilising high efficiency building services, prior to considering LZC technologies.

3.1 Lean Building

Item 3. policy SD48 requires an adaptation of sustainable design and construction to minimise energy demand. Energy usage can be greatly reduced through improvement of the building fabric U-Values. Table 1 lists the proposed 'U-Values' for the scheme, which have been included within the thermal model to assist with generating the energy and carbon emission valves recorded.

In addition to the reduction in the target U-Values, the new building will benefit from a low air permeability (air leakage) performance of $3m^3/h@50Pa$.

Table 1. Building Fabric Performance

Element	Proposed U-Values (W/m^2K)	Building Regulations U-Values (W/m^2K)
Ground Floor	0.22	0.25
Roof	0.18	0.25
External Wall	0.26	0.35
Glazing	1.60	2.20

3.2 Mean Building

To minimise the energy consumption from the lighting scheme, low energy LED lighting is to be provided throughout. Control of the lighting will be in accordance with current building regulation requirements.

Gas Fired Radiant Heaters will be supplied to condition the warehouse. Using infrared waves, radiant heat warms all solid objects and surfaces in its path. Energy is passed through the air, dissipating as heat upon contact with surfaces and people, resulting in a comfortable condition. Radiant heaters are ideal for spot or localised heating.

Highly responsive, taking a matter of minutes to reach comfortable temperatures, ensuring energy is never wasted during heat up.

Due to large service door, a natural ventilation strategy is to be proposed, this accompanies the radiant heaters as when the shutter door opens, allowing cold air to enter, radiant heating will recover comfortable temperatures within a matter of minutes.

3.3 Green Building

The initial approach was to allow for a Photovoltaic Array (PV) however the site will be screened by tall mature trees, resulting in a low return.

Due to the Lean and Mean steps being implemented, it was concluded that there were no suitable renewable options to be added to the development.

Energy Demand & Carbon Dioxide Emissions

In accordance with Item 4. Policy SD48, each step proposed culminates in a low energy, low carbon dioxide emission, flexible and compliant building, reducing its whole life CO2 emissions impact.

The building regulated annual energy demand and resultant carbon dioxide emission has been predicted using the ‘Lean, Mean, Green’ approach to sustainable design and approved building regulations software resulting in the following;

Area	Regulated Energy Demand		Carbon Dioxide	
	Actual	Notional	Actual	Notional
	$kWh/m^2/Annum$	$kWhm^2/Annum$	$kgCO_2.m^2/Annum$	$kgCO_2/Annum$
Proposed	69.57	97.56	35.7	38.0

4.0 Health and Wellbeing

The warehouse is provided with a large service door which provides natural daylight to flood in when open, it also allows for high levels of fresh air to be supplied which contribute to the health and wellbeing of the occupants.

5.0 Pollution

All gas fired systems are of a high efficiency and are installed to the recommended standards, with all flues discharging atmospherically.

6.0 Sustainability in Construction

The construction team will always have sustainability in mind when working with the design team. They will jointly consider the design requirements and incorporate energy-saving technologies, consider inside and outside temperature variances, avoid wastage of materials by working to standard sizes, and promote the practice of designing to deconstruct, meaning that more material can be easily recycled or reused, when assets reach the end of their life.

The contractor shall look to use off-site fabrications which can have a significant and positive impact on sustainability. These include reduced fuel usage resulting from a reduction in the number of site deliveries and the number of individual trades that are needed on site. Finally, off-site fabrication dramatically reduces the risk of pollution with painting being undertaken in controlled conditions. The contractor would also look to use the manufacture of ‘specials’ to reduce waste, for example by ordering plasterboard in a non-standard size to avoid producing offcuts. Initiatives recently implemented include, prefabricated services modules with plasterboard partition heads, ventilation ductwork, water service pipework and cable trays.

To minimise life-cycle impact, the project team will use the BRE ‘Green Guide to Specification’ to ensure robustness and sustainability of specified materials. The contractor shall procure all timber to a legal and sustainable specification, including Forest Steward Council (FSC) and Governmental Central Point of Expertise on Timber (CPET). All timber will be bought from responsible companies who can provide cradle -to-grave verification.