



Proposed Extensions at Stockwood Free Church, Ladman Road, Stockwood, Bristol

SUSTAINABILITY REPORT

May 2017



Introduction

This report has been prepared by Award Energy Consultants to support the planning application for the proposed extensions at Stockwood Free Church. This report considers and evaluates the renewable technology measures utilised in order to reduce the predicted carbon emissions of the development by 20% as per Bristol City Council's development policies. The report also outlines the sustainable design and construction methods proposed for the development, along with proposals for measures to deal with surface water and waste at the site.

Policy Context

The following documents were considered:

Building Regulations 2013 –Part L2 sets minimum standards for fabric and energy efficiency for new build non-domestic buildings.

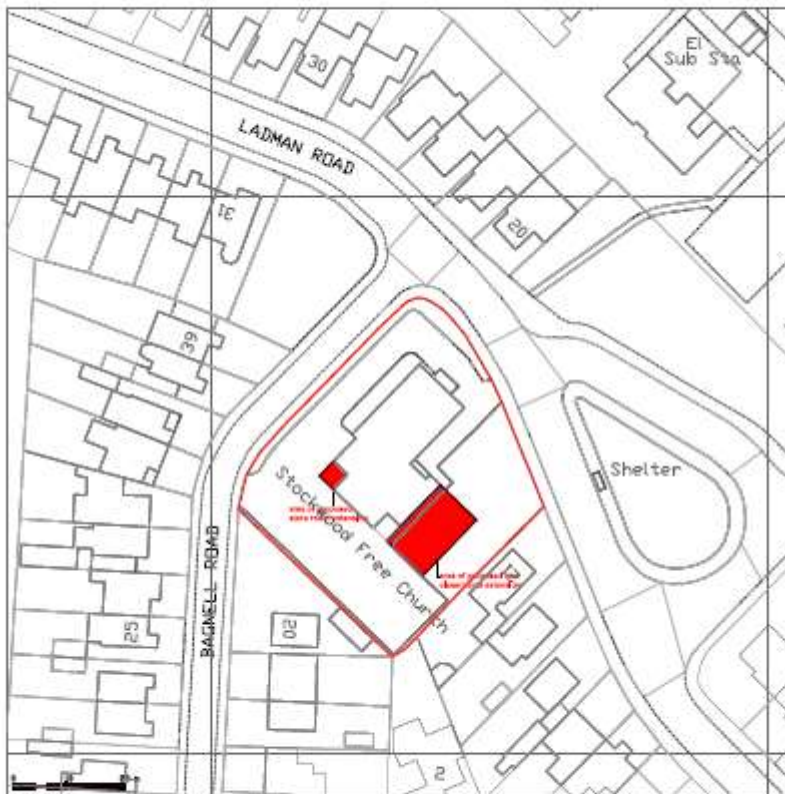
National Planning Policy Framework 2012 – strengthens the emphasis on sustainable development, and requires new developments to secure the highest viable resource and energy efficiency and reduction in emissions by considering Governments and other national standards.

Bristol City Council's Policy BCS14 - requires developments to secure at least a 20% reduction in CO₂ emissions through the use of renewable technology

Bristol City Council's Policy BCS15 - requires all development to engage with issues around sustainable design and construction.

Bristol City Council's Policy BCS16 - requires all development to include water management measures to reduce surface water run-off

Site Layout



block plan 1:500

Carbon Reduction Calculations

A set of BRUKL calculations showing compliance with Part L2a of the 2013 Building Regulations were undertaken on the design of the thermal elements and building services, using approved SBEM software.

The predicted carbon emissions produced by the proposed development were calculated using approved SBEM software. Data was entered in line with the design team's enhanced construction specification and drawings, as per Table 1 below.

The specification was amended where required to pass the minimum requirements of Part L2a of the 2013 Building Regulations. The resulting BRUKL calculations were then used to calculate the total predicted carbon emissions from the site as 15.4 KgCO₂/m²/Year. SBEM software was then used to calculate the amount of photovoltaic (PV) power required to reduce the site's carbon emissions by a minimum of 20%. It was established that 4 325w PV panels on the roof will reduce carbon emissions by **21.43%**, as shown in Table 2.

Table 1

Element	2013 Building Regulations Limiting Fabric Parameters (u-values)	Enhanced Specification (u-values)
Wall	0.35 w/m ² k	0.28 w/m ² k
Floor	0.25 w/m ² k	0.16 w/m ² k
Roof	0.25 w/m ² k	0.16 w/m ² k
Windows- Average U-value	2.2 w/m ² k	1.6 w/m ² k
Air permeability	10 m ³ /hm ²	5 m ³ /hm ²

* For U-values: See Approved Document L2a 2013 Building Regulations

Table 2

Building Regulations Minimum Standards Total Carbon Emissions (KgCO ₂ /m ² /Year) Part L2a 2013	Application of 4 x 325w Photovoltaic panels Total Carbon Emissions (KgCO ₂ /m ² /Year) Part L2a 2013	% reduction in Carbon Emissions
15.4	12.1	21.43%

*BRUKL documentation available on request

Carbon Reduction and Energy Efficiency Measures

The following summarises the proposed carbon reduction and energy efficiency strategies that have been incorporated into the development at Stockwood Free Church.

- All the building elements i.e. walls, roofs, floors, windows and doors will be at least 20% more efficient than required by the current building regulations in Approved Document L, to reduce the total amount of heat lost from the building
- High levels of insulation across all thermal elements within the build
- High levels of air tightness to be achieved within the construction of the extension to reduce unnecessary heat loss
- 100% dedicated low energy lighting with Passive Infra-Red controls and daylight dimming controls utilised, where feasible
- Natural ventilation is the most energy efficient form of ventilating a space. To this end, the classrooms will be naturally ventilated via open-able windows and trickle vents. Cross-ventilation to be provided on opposing sides of the flat roof by a proprietary eaves ventilation strip equivalent to 25mm continuous with fly proof screen.
- All external light fittings will be provided with energy efficient light bulbs with appropriate control systems for efficient usage
- Timber products are sourced from sustainably managed forests, preferably with FSC (or similar) certification available, and all timber will be from a legal source
- Materials with low Ozone Depleting Potential and Global Warming Potential will be used where practicable compared to those with higher impacts

Water Management

The Stockwood Free Church is situated in an area designated by the Environment Agency as Flood Zone 1, representing a low risk of flooding.

Surface water will be stored and utilised within the development in the form of water butts, with soakaways anticipated to accommodate excessive rainfall volumes.

Waste

- Adequate external space for storing recyclable and non-recyclable waste will be provided that caters for the widest range of users, including wheelchair users and older people
- The construction phase of the development will have a site waste management strategies in place which includes procedures, commitment and monitoring to divert waste from landfill.
- All construction activities will be carried out in order to minimise dust, fumes, discharges and any other form of pollution on site, in line with best practice policies.

Ecology

The proposals are designed to have no impact on the ecology or biodiversity of the site, with the extensions proposed to cover a small area of land which is currently laid to grass. Whilst the final landscaping design has yet to be decided, every effort will be made to protect the existing trees, with re-planting to compensate if necessary. The possibility of installing bird and bat boxes will be explored.

Conclusion

This report therefore demonstrates that site-wide carbon emissions been reduced by **21.43%** through the application of 4 x 325w photovoltaic panels to the roof. This exceeds the 20% carbon reduction requirement of Bristol City Council's planning policy BCS14. Consideration has been given to design, location and material usage in order to reduce energy consumption and carbon emissions throughout the lifetime of the development, which combined with surface water and waste mitigation measures meet the requirements of BCS15 and BCS16.

CAVEAT

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