

Sustainability & Energy Statement

Heathlands Farm, Honey Hill, Wokingham

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Executive Summary

This Sustainability and Energy Statement has been prepared in support of a planning application for the construction of an extension to the existing pack house following the demolition of existing structures at Heathlands Farm, Honey Hill, Wokingham.

The Statement includes an energy strategy showing how selected energy efficiency, low carbon and renewable energy measures have been considered and those, which have been incorporated into the scheme.

BRUKL calculations have been prepared for the extension based upon the construction specification set out within the report and the detailed planning drawings. These provide an accurate assessment of the energy demand and carbon emissions from the building.

It is proposed to enhance the fabric insulation standards of the building above the minimum required by the Building Regulations. In addition, it is proposed to target a 38% improvement in the air tightness standard of the building compared with the maximum permissible by the Building Regulations.

The applicant has recently developed a solar farm on land to the south of the site and has maximised the output capacity from the site. Therefore, whilst it is not possible to install further photovoltaic panels onto the roof of the extension it is proposed to allocate 83kW of the existing photovoltaic solar farm capacity to the extension. The solar farm has a total output of 724 kW and this is allocated to and used by the various accommodation at Heathlands Farm.

The BRUKL Output Document for the extension is attached as Appendix 1 but the carbon emissions can be summarised as follows;

	Total Carbon Emissions
	kg CO ₂ per year
Target Emissions (TER)	4,413
Actual Emissions (BER) – based on heat pumps to ancillary areas and PV panels	-924
Reduction in Emissions	121%

The actual emissions are a negative figure because the photovoltaic array generates more electricity than the extension requires to operate.

The extension is net zero carbon and the reduction in emissions equates to 121%.

The extension will also benefit from efficient water appliances, with all WCs being low volume, dual flush units and the hand wash area using aerated, low flow rate appliances.

1.0 Introduction

This report provides a Sustainability and Energy Statement in support of a planning application for the construction of an extension to the existing pack house following the demolition of existing structures at Heathlands Farm, Honey Hill, Wokingham.

The report describes the methodology used in assessing the development and the initiatives proposed.

The building has been designed and will be constructed to reduce energy demand and carbon dioxide emissions. The objective is to reduce the energy demand to an economic minimum by making investments in the parts of the building that have the greatest impact on energy demand and are the most difficult and costly to change in the future, namely the building fabric.

Once a cost-effective structure has been designed, low-carbon and renewable technologies have been considered to provide heat and/or electricity.

The following hierarchy has been followed:

- Lean reduce demand and consumption
- Clean increase energy efficiency
- Green provide low carbon renewable energy sources

The report has been prepared by Ivan Ball of Bluesky Unlimited who are sustainability consultants.

2.0 Planning Policy Context

National Policy

The UK Government published its sustainable development strategy in 1999 entitled “A better quality of life: A strategy for sustainable development in the UK”. This sets out four main objectives for sustainable development in the UK:

- Social progress that recognises the needs of everyone.
- Effective protection of the environment.
- Prudent use of natural resources.
- Maintenance of high stable levels of economic growth and employment.

Sustainable Communities: Building for the Future, known colloquially as the Communities Plan was published in 2003. The Plan sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas. It aims to tackle housing supply issues in parts of the country, low demand in other parts and the quality of our public spaces. The Communities Plan describes sustainable communities as: Active, inclusive and safe, well run, environmentally sensitive, well designed and built, well connected, thriving, well served and fair for everyone.

The most relevant national planning policy guidance on sustainability is set out in:

- National Planning Policy Framework – December 2024

Paragraph 161 states;

‘The planning system should support the transition to net zero by 2050 and take full account of all climate impacts including overheating, water scarcity, storm and flood risks and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.’

Local Policy

Wokingham Borough Local Development Framework – Adopted Core Strategy Development Plan Document, January 2010

CP1 – Sustainable development

Planning permission will be granted for development proposals that:

- 1) Maintain or enhance the high quality of the environment;*
- 2) Minimise the emission of pollutants into the wider environment;*
- 3) Limit any adverse effects on water quality (including ground water);*
- 4) Ensure the provision of adequate drainage;*
- 5) Minimise the consumption and use of resources and provide for recycling;*
- 6) Incorporate facilities for recycling of water and waste to help reduce per capita water consumption;*
- 7) Avoid areas of best and most versatile agricultural land;*
- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;*
- 9) Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater);*
- 10) Provide attractive, functional, accessible, safe, secure and adaptable schemes;*
- 11) Demonstrate how they support opportunities for reducing the need to travel, particularly by private car in line with CP6; and*
- 12) Contribute towards the goal of reaching zero-carbon developments as soon as possible by:*
 - a) Including appropriate on-site renewable energy features; and*
 - b) Minimising energy and water consumption by measures including the use of appropriate layout and orientation, building form, design and construction, and design to take account of microclimate so as to minimise carbon dioxide emissions through giving careful consideration to how all aspects of development form.*

CP2 - Inclusive communities

To ensure that new development contributes to the provision of sustainable and inclusive communities (including the provision of community facilities) to meet long term needs, planning permission will be granted for proposals that address the requirements of:

- a) An ageing population, particularly in terms of housing, health and wellbeing;*
- b) Children, young people and families, including the co-ordination of services to meet their needs;*
- c) People with special needs, including those with a physical, sensory or learning disability or problems accessing services; and*
- d) The specific identified needs of minority groups in the borough, including Gypsies, Travellers and Travelling Showpeople and black and minority ethnic groups. Proposals for gypsies, travellers and travelling showpeople (including allocations in other Development Plan Documents) will demonstrate that:*
 - i) The site is located either within or close to the development limits of a settlement in policy*

*CP9 in order to maximise the possibilities for social inclusion and sustainable patterns of living;
and*

- ii) The proposed site is not disproportionate to the scale of the existing settlement whether singly
or cumulatively with any existing sites in the area.*

Wokingham Borough Development Plan – Adopted Managing Development Delivery Local Plan, February 2014

Policy CC01 – Presumption in Favour of Sustainable Development

- 1. Planning applications that accord with the policies in the Development Plan for Wokingham Borough will be approved without delay, unless material considerations indicate otherwise.*
- 2. Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision then the Council will grant permission unless material considerations indicate otherwise – taking into account whether:*
 - a. Any adverse impacts of planning permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework (NPPF) taken as a whole; or*
 - b. Specific policies in the National Planning Policy Framework indicate that development should be restricted.*

Policy CC04: Sustainable Design and Construction

Planning permission will only be granted for proposals that seek to deliver high quality sustainably designed and constructed developments by:

- 1. In respect of all new homes:*
 - a) Seeking to achieve the requirements of the full Code for Sustainable Homes Level 4;^{*}*
 - b) Meet internal potable water consumption targets of 105 litres or less per person per day (as part of the requirement to meet full Code for Sustainable Homes Level 4).*

Policy CC05: Renewable energy and decentralised energy networks

- 1. Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged*
- 2. Planning permission will only be granted for proposals that deliver a minimum 10% reduction in carbon emissions through renewable energy or low carbon technology where the development is for:*
 - a) Schemes of more than 10 dwellings (gross), or*
 - b) Non-residential proposals of more than 1,000 sq m gross floorspace.*

3. *Proposals for renewable energy and decentralised energy works, including wind turbines, must demonstrate that:*
- a) They are appropriate in scale, location and technology type;*
 - b) Are compatible with the surrounding area, including the impact of noise and odour;*
 - c) Do not have a damaging impact on the local topography and landscape;*
 - d) There is no significant impact upon heritage assets, including views important to their setting;*
 - e) In the case of wind turbines, take account of their cumulative effect and properly reflect their increasing impact on the landscape and on local amenity.*

Sustainable Design and Construction SPD, 28th May 2010 and Companion Document to the Sustainable Design and Construction Supplementary Planning Document, 28th May 2010.

These documents have been used to inform this Sustainability and Energy Statement.

3.0 Assessment Methodology

The carbon emissions from the extension have been established using an agreed building specification and the detailed planning drawings.

A BRUKL calculation has been prepared for the extension based on the use of photovoltaic panels, which have recently been installed on the adjacent solar farm.

Emission Factors

The CO₂ emission factors, where applicable, used throughout this report have been taken from the Building Regulation Approved Document L - 2021.

	kg CO ₂ /kWh
Mains gas	0.210
Grid supplied and displaced electricity	0.136

4.0 Proposal

The proposal is for the construction of an extension which will be used as a pack house. The building will contain various items of equipment and plant, which are not included within the BRUKL calculation, as required by the SBEM methodology.

The accommodation schedule in detail is;

Unit Type	Number	Area
		m ²
Pack House Extension	1	2,982.0
Total	1	2,982.0

5.0 Energy Efficiency

5.1 Demand Reduction (Be Lean)

Design

The energy performance of a building is affected by its design, construction and use and whilst occupant behaviour is beyond the remit of this statement, better design and construction methods can significantly reduce the life cycle emissions of a building and assist the occupant to reduce consumption.

Sustainable design is not just about incorporating renewable technologies; buildings should be designed at the outset to provide suitable environmental conditions for the occupants whilst also consuming as little energy as practical.

Passive Design Measures

The passive design measures proposed include;

Passive Solar Gain

Passive measures include allowing for natural ventilation and exposed thermal mass coupled with high levels of insulation, air tightness and the control of solar gain.

Efficient Building Fabric

Building Envelope

U-values of the building envelope must meet Building Regulations Part L standards and further improvements to U-values will reduce the building's heating requirements.

The ground floor will be insulated with at least 120mm of Quinn Therm PIR insulation or similar.

The building will be constructed using a framed structure with insulated cladding but regardless of the construction it is assumed the U-values set out below can be met by a variety of construction types.

The roof will be insulated with 200mm of PIR insulation.

Windows are proposed as double glazed with Low 'e' soft coat and argon filled.

It is proposed to set maximum limits for the elemental U-values as follows:

Element	Part L Limiting U-values	Proposed U-values	Proposed Improvement
	W/m ² K	W/m ² K	
Ground Floor	0.18	0.12	33%
External Walls	0.26	0.18	31%
Roof	0.16	0.15	6%
Windows	1.60	1.20	25%
External Doors	1.60	1.20	25%

Air Leakage

Large amounts of heat are lost in winter through air leakage from a building (also referred to as infiltration or air permeability) often through poor sealing of joints and openings in the building.

The Building Regulations set a minimum standard for air permeability of 8 m³ of air per hour per m² of envelope area, at 50Pa. It is proposed to achieve a 38% improvement over Building Regulations and the building will target a permeability of 5.0 m³/hr/m².

Thermal Bridging

The significance of Thermal Bridging, as a potentially major source of fabric heat losses, is increasingly understood. Improving the U-values for the main building fabric without accurately addressing the Thermal Bridging is no longer an option and will not achieve the fabric energy efficiency and energy and CO₂ reduction targets set out in this strategy.

The thermal details for the building will be modelled at the detailed working drawing stage but for the purposes of this assessment the thermal details formulated by the Recognised Construction Details have been used.

Any details not available on the RCD website will be modelled. These will enable the building to achieve the higher energy efficiency requirements of the Building Regulations.

The following table provides the values currently used within the modelled SAP calculations.

Reference	Location	PSI Value
		W/mK
E2	Other Lintels (including other steel lintels)	0.028
E3	Sill	0.024
E4	Jamb	0.019
E5	Ground Floor (Normal)	0.046
E14	Roof	0.041
E16	Corner (normal)	0.037
E17	Corner (inverted)	-0.079

Ventilation

As a result of increasing thermal efficiency and air tightness, Building Regulations Approved Document F was also revised in 2021 to address the possibility of overheating and poor air quality.

Mechanical extract ventilation will be provided to the WCs and Tea Points.

Active Design Measures will include;

Efficient Lighting and Controls

Throughout the scheme natural lighting will be optimised.

All internal lighting will be energy efficient and the attached BRUKL is based on the installation of light fittings with an efficacy of 115 lumens/Watt.

Space Heating and Hot Water

The space heating and hot water demand of the building is low and therefore includes the installation of local, point of use appliances within the washroom and WCs.

5.2 Low-Carbon and Renewable Technologies (Be Clean and Be Green)

The carbon dioxide emissions established above have been used to test the viability of various renewable and low carbon technologies as follows.

The Government's Renewable Obligation defines renewable energy in the UK. The identified technologies are;

- Small hydro-electric
- Landfill and sewage gas
- Onshore and offshore wind
- Biomass
- Tidal and wave power
- Geothermal power
- Solar

The use of landfill or sewage gas, offshore wind or any form of hydroelectric power is not suitable for the site due to its location. The remaining technologies are considered below;

Wind

Wind turbines are available in various sizes from large rotors able to supply whole communities to small roof or wall-mounted units for individual dwellings.

The Government wind speed database predicts local wind speeds at Honey Hill to be 4.7 m/s at 10m above ground level and 5.5 m/s at 25m above ground level. This is below the level generally required for commercial investment in large wind turbines. In addition the land take, potential for noise and signal interference make a large wind turbine unsuitable for this development.

Roof mounted turbines could be used at the development to generate small but valuable amounts of renewable electricity but the small output and contribution to total emissions means any investment would be small and purely tokenism. In addition, the use of wind turbines will have a detrimental aesthetic impact on the appearance of the building.

Combined Heat and Power and Community Heating

Combined heat and power (CHP) also called co-generation is a de-centralised method of producing electricity from a fuel and 'capturing' the heat generated for use in buildings. The plant is essentially a small-scale electrical power station. The production and transportation of electricity via the National Grid is very inefficient with over 65% of the energy produced at the power station being lost to the atmosphere and through transportation.

Consequently CHP can demonstrate significant CO₂ savings and although not necessary classed as renewable energy (depending on the fuel used) the technology is low carbon.

For a CHP plant to be economic it needs to operate for as much of the time as possible (usually deemed to be in excess of 14 hours per day) and therefore the size of the unit are usually based upon the hot water load of the building (s) with additional boilers meeting the peak space heating demand.

There is insufficient baseload to justify a CHP unit and therefore this technology is not proposed.

Ground Source Heat Pumps

Sub soil temperatures are reasonably constant and predictable in the UK, providing a store of the sun's energy throughout the year. Below London the groundwater in the lower London aquifer is at a fairly constant temperature of 12° C. Ground source heat pumps (GSHP) extract this low-grade heat and convert it to usable heat for space heating.

GSHP operates on a similar principle to refrigerators, transferring heat from a cool place to a warmer place. They operate most efficiently when providing space heating at a low temperature, typically via under floor heating or with low temperature radiators.

Whilst there is external space around the building for a horizontal collection system the installation of a ground source heat will be cost prohibitive and therefore is not proposed.

Solar

(i) Solar Water Heating

Solar hot water panels use the sun's energy to directly heat water circulating through panels or pipes. The technology is simple and easily understood by purchasers.

Solar hot water heating panels are based generally around two types, which are available being 'flat plate collectors' and 'evacuated tubes'. Flat plate collectors can achieve an output of up to 1,124 kWh/annum (Schuco) and evacuated tubes can achieve outputs up to 1,365 kWh/annum (Riomay).

Panels are traditionally roof mounted and for highest efficiencies should be mounted plus or minus 30 degrees of due south. Evacuated tubes can be laid horizontally on flat roofs but flat plate collectors are recommended for installation at an incline of 30 degrees

The hot water demand for the building is very low and the installation of solar hot water heating panels does represent good value when compared with other technologies.

The installation of solar hot water heating panels is therefore not proposed.

(ii) Photovoltaics

Photovoltaic panels (PV) provide clean silent electricity. They generate electricity during most daylight conditions although they are most efficient when exposed to direct sunlight or are orientated to face plus or minus 30 degrees of due south. PV panels can be integrated into many different aspects of a development including roofs, walls, shading devices or architectural panels and typically have an electrical warranty of 20-25 years with an expected system lifespan of 25-40 years.

Whilst the roof of the building could accept photovoltaic panels installations the applicant has already installed a considerable quantity of photovoltaic panels both on the roofs of the existing building but also on the recent development of a solar farm to the south of the proposed extension. Consequently, the output from the site has been maximised and the local infrastructure cannot accommodate further installations. However, the development of the solar farm was undertaken on the basis that part would serve the proposed pack house extension and therefore 83 kW has been allocated to the new building.

The BRUKL calculation, which has been prepared for the extension is based upon the connection of this quantum of PV.

Air Source Heat Pumps (ASHPs)

Air sourced heat pumps operate using the same reverse refrigeration cycle as ground source heat pumps; however, the initial heat energy is extracted from the external air rather than the ground.

The system works by transferring heat absorbed from the outside air to an indoor space using a wet central heating system to heat radiators or underfloor heating and provide domestic hot water. Heat pumps work similarly to a refrigerator in that they absorb heat and transfer it to another medium.

The space heating and hot water demand is low and there is only a requirement for local, point of use appliances in the washroom and WCs. The use of an ASHP is therefore not appropriate.

5.3 Establishing Carbon Dioxide Emissions

A BRUKL calculation has been prepared using the methodology set out in Part L of the Building Regulations.

This has been based on the fabric specification set out above, which includes energy efficient thermal elements and the connection of a photovoltaic array of 83 kW.

The BRUKL Output Document is attached as Appendix 1 but the emissions can be summarised as follows;

Pack House Extension	Notional Energy Consumption	Actual Energy Consumption
	kWh/m ² /yr	kWh/m ² /yr
Heating	5.26	2.68
Cooling	0.00	0.00
Auxiliary	0.60	0.77
Lighting	5.93	9.13
Hot Water	3.93	3.93
Total	15.73	16.52
Emissions	1.48	-0.31

The target emissions from the building are calculated as **4,413 kg CO₂ per year** with the actual emissions from the building calculated as **-924 kg CO₂ per year**.

The actual emissions are a negative figure because the connected photovoltaic array generates more electricity than the building requires to operate.

The building is net zero carbon and the reduction in emissions equates to 121%.

5.4 Summary of Calculations and Proposals for Low-carbon and Renewable Technologies

Be Lean

The U-values for the proposed building are based on good practice standards and all improve upon the limiting U-values set by Part L of the Building Regulations.

The air tightness standard of the building will target a 38% improved over the maximum permissible by the Regulations.

Be Green

Various technologies are considered above and whilst wind turbines, combined heat and power, ground source heat pumps, solar hot water heating panels and the use of air source heat pumps are not considered appropriate, the installation of photovoltaic panels are considered feasible.

It is proposed to connect a photovoltaic array of 83 kW.

The target emissions (TER) from the building are calculated as **4,413 kg CO₂ per year** with the actual emissions (BER) calculated as **-924 kg CO₂ per year**.

The actual emissions are a negative figure because the connected photovoltaic array generates more electricity than the building requires to operate.

The building is net zero carbon and the reduction in emissions equates to 121%.

6.0 Climate change adaption and Water resources

Sustainable Drainage Systems (SUDS)

The site lies within Flood Zone 1 and is classified as being of low risk. It is understood that surface water run-off will be dealt with on site and will discharge to infiltration trenches or soakaways.

Water efficiency measures

In excess of 20% of the UK's water is used domestically with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.

Water efficient devices will be fully evaluated, and installed, wherever possible. The specification of such devices will be considered at detailed design stage and each will be subject to an evaluation based on technical performance, cost and market appeal, together with compliance with the water use regulations.

The following appliances will be incorporated within the building:

- water efficient taps;
- water efficient toilets and
- a water meter.

7.0 Materials and Waste

The BRE Green Guide to Specification is a simple guide for design professionals. The guide provides environmental impact, cost and replacement interval information for a wide range of commonly used building specifications over a notional 60-year building life. The construction specification will prioritise materials within ratings A+, A or B.

Preference will be given to the use of local materials & suppliers where viable to reduce the transport distances and to support the local economy. A full evaluation of these suppliers will be undertaken at the next stage of design.

In addition, timber would be sourced, where practical, certified by PEFC or an equivalent approved certification body and all site timber used within the construction process would be recycled.

All insulation materials to will have a zero ozone depleting potential

Construction waste

Targets will be set to promote resource efficiency in accordance with guidance from WRAP, Envirowise, BRE and DEFRA.

The overarching principle of waste management is that waste should be treated or disposed of within the region where it is produced.

Construction operations generate waste materials as a result of general handling losses and surpluses.

These wastes can be reduced through appropriate selection of the construction method, good site management practices and spotting opportunities to avoid creating unnecessary waste.

The Construction Strategy will explore these issues, some of which are set out below:

- Proper handling and storage of all materials to avoid damage;
- Efficient purchasing arrangements to minimise over ordering;
- Segregation of construction waste to maximise potential for reuse/recycling and
- Suppliers who collect and reuse/recycle packaging materials.

Appendix 1 – BRUKL Output Document for the Extension

Project name

Heathlands Farm, Wokingham**As designed****Date:** Thu Aug 28 09:10:58 2025

Administrative information

Building Details

Address: Heathlands Farm, Honey Hill, Wokingham

Certifier details

Name:**Telephone number:****Address:**

Certification tool

Calculation engine: SBEM**Calculation engine version:** v6.1.e.0**Interface to calculation engine:** DesignBuilder SBEM**Interface to calculation engine version:** v7.2.0**BRUKL compliance module version:** v6.1.e.1**Foundation area [m²]:** 150.06The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	1.48
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.31
Target primary energy rate (TPER), kWh _{PE} /m ² annum	15.1
Building primary energy rate (BPER), kWh _{PE} /m ² annum	-5.6
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.18	0.18	Level 0 - 1 Office_P_5
Floors	0.18	0.12	0.15	Level 0 - 2 WC_S_3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	Level 1 - 1 Office_R_4
Windows** and roof windows	1.6	1.2	1.2	Level 0 - 1 Office_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
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-Limit = Limiting area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]U_a-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	5

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Project HVAC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	-	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- Project DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
Level 0 - 2 WC	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Level 0 - 2 Tea Point	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Level 0 - 1 WC	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Level 1 - 2 WC	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Level 1 - 2 Tea Point	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Level 1 - 1 WC	0.3	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value		95	80	0.3
Level 0 - 1 Warehouse		115	-	-
Level 0 - 2 Warehouse		115	-	-
Level 0 - 1 Office		115	-	-
Level 0 - 2 Office		115	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
Level 0 - 2 Store		115	-	-
Level 0 - 2 WC		115	-	-
Level 0 - 2 Store		115	-	-
Level 0 - 2 Stairs		115	-	-
Level 0 - 2 Tea Point		115	-	-
Level 0 - 1 WC		115	-	-
Level 0 - 1 Stairs		115	-	-
Level 0 - 1 Store 1		115	-	-
Level 0 - 1 Tea Point		115	-	-
Level 0 - 1 Store		115	-	-
Level 1 - 1 Office		115	-	-
Level 1 - 2 Office		115	-	-
Level 1 - 2 Store 1		115	-	-
Level 1 - 2 WC		115	-	-
Level 1 - 2 Store		115	-	-
Level 1 - 2 Stairs		115	-	-
Level 1 - 2 Tea Point		115	-	-
Level 1 - 1 WC		115	-	-
Level 1 - 1 Stairs		115	-	-
Level 1 - 1 Store 1		115	-	-
Level 1 - 1 Tea Point		115	-	-
Level 1 - 1 Store		115	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Level 0 - 1 Warehouse	NO (-66.9%)	NO
Level 0 - 2 Warehouse	NO (-81.3%)	NO
Level 0 - 1 Office	NO (-6.8%)	NO
Level 0 - 2 Office	NO (-64%)	NO
Level 0 - 2 Tea Point	N/A	N/A
Level 0 - 1 Tea Point	N/A	N/A
Level 1 - 1 Office	NO (-57.4%)	NO
Level 1 - 2 Office	NO (-68%)	NO
Level 1 - 2 Tea Point	N/A	N/A
Level 1 - 1 Tea Point	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	2982.0	2982.0
External area [m ²]	2996.7	2996.7
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	5	5
Average conductance [W/K]	646.47	999.98
Average U-value [W/m ² K]	0.22	0.33
Alpha value* [%]	14.62	47.55

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area Building Type

Retail/Financial and Professional Services
 Restaurants and Cafes/Drinking Establishments/Takeaways
 Offices and Workshop Businesses
 General Industrial and Special Industrial Groups

100 Storage or Distribution

Hotels
 Residential Institutions: Hospitals and Care Homes
 Residential Institutions: Residential Schools
 Residential Institutions: Universities and Colleges
 Secure Residential Institutions
 Residential Spaces
 Non-residential Institutions: Community/Day Centre
 Non-residential Institutions: Libraries, Museums, and Galleries
 Non-residential Institutions: Education
 Non-residential Institutions: Primary Health Care Building
 Non-residential Institutions: Crown and County Courts
 General Assembly and Leisure, Night Clubs, and Theatres
 Others: Passenger Terminals
 Others: Emergency Services
 Others: Miscellaneous 24hr Activities
 Others: Car Parks 24 hrs
 Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	2.68	5.26
Cooling	0	0
Auxiliary	0.77	0.6
Lighting	9.13	5.93
Hot water	3.93	3.93
Equipment*	31.07	31.07
TOTAL **	16.52	15.73

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	57.20	5.73
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>57.20</i>	<i>5.73</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	157.9	297.19
Primary energy [kWh _{PE} /m ²]	-5.6	15.1
Total emissions [kg/m ²]	-0.31	1.48

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] No Heating or Cooling										
	Actual	101.2	35.9	0	0	0	0	0	0	0
	Notional	230.2	75.7	0	0	0	0	----	----	----
[ST] Central heating using water: convectors, [HS] ASHP, [HFT] Electricity, [CFT] Natural Gas										
	Actual	104.1	107.5	9.6	0	2.8	3.01	0	3.2	0
	Notional	179.2	95.6	18.8	0	2.2	2.64	0	----	----

Key to terms

- Heat dem [MJ/m2] = Heating energy demand
- Cool dem [MJ/m2] = Cooling energy demand
- Heat con [kWh/m2] = Heating energy consumption
- Cool con [kWh/m2] = Cooling energy consumption
- Aux con [kWh/m2] = Auxiliary energy consumption
- Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
- Cool SSEER = Cooling system seasonal energy efficiency ratio
- Heat gen SSEFF = Heating generator seasonal efficiency
- Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
- ST = System type
- HS = Heat source
- HFT = Heating fuel type
- CFT = Cooling fuel type