

Project name

Sipson Garden Centre - biomass**As designed****Date:** Tue Aug 20 13:05:56 2019

Administrative information

Building Details

Address: Heathrow Garden Centre, Sipson Road, Sipson,
West drayton, UB7 0HP

Certification tool

Calculation engine: SBEM**Calculation engine version:** v5.6.a.1**Interface to calculation engine:** DesignBuilder SBEM**Interface to calculation engine version:** v6.1.0**BRUKL compliance check version:** v5.6.a.1

Owner Details

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

Certifier details

Name: Jonathan Wilson**Telephone number:** 01892 315 466**Address:** Energytest (Commercial) Ltd, 4 St John's Road
Tunbridge Wells, Kent TN4 9NP**Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target**

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	22.9
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	22.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	14
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.22	0.22	Garden Centre - Sales_W_6
Floor	0.25	0.18	0.18	Garden Centre - Sales_S_3
Roof	0.25	0.14	0.14	Garden Centre - Warehouse_R_11
Windows***, roof windows, and rooflights	2.2	2	2	Garden Centre - Sales_G_7
Personnel doors	2.2	1.8	1.8	Garden Centre - Sales_D_13
Vehicle access & similar large doors	1.5	1.5	1.5	Garden Centre - Warehouse_D_4
High usage entrance doors	3.5	1.8	1.8	Garden Centre - Sales_D_8
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* There might be more than one surface where the maximum U-value occurs.				
** 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.				
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	5

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- biomass blower

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.85	-	-	0.3	-
Standard value	0.75	N/A	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

2- biomass boiler

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.85	-	-	-	-
Standard value	0.75	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- biomass DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	-
Standard value	N/A	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
Garden Centre - Sales		-	162	90	10134
Garden Centre - Warehouse		98	-	-	1998
Garden Centre - Staff Dis WC		-	601	-	9
Garden Centre - Staff WC		-	474	90	34
Garden Centre - Staff WC Lobby		-	602	-	7
Garden Centre - Staff		111	-	-	450
Garden Centre - Butcher Store		143	-	-	34
Garden Centre - Office 1		162	-	-	102
Garden Centre - Office		202	-	-	79
Garden Centre - Staff Circ		-	402	-	37
Garden Centre - Cafe		-	204	90	487
Garden Centre - Butchers		-	208	90	572
Garden Centre - WC 1		-	344	-	39
Garden Centre - Dis WC		-	603	-	9
Garden Centre - Kitchen		-	236	-	358
Garden Centre - Warehouse entrance		-	291	-	34
Garden Centre - Circulation		-	232	90	671
Garden Centre - WC		-	320	-	49

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Garden Centre - Sales	YES (+397.1%)	NO
Garden Centre - Warehouse	N/A	N/A
Garden Centre - Staff WC	YES (+16.8%)	NO
Garden Centre - Staff	YES (+70.7%)	NO
Garden Centre - Office 1	NO (-70%)	NO
Garden Centre - Office	N/A	N/A
Garden Centre - Cafe	NO (-32.2%)	NO
Garden Centre - Butchers	N/A	N/A
Garden Centre - Circulation	N/A	N/A

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of 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
Area [m ²]	2191.1	2191.1
External area [m ²]	5684.4	5684.4
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	5	6
Average conductance [W/K]	3057.06	1887.04
Average U-value [W/m ² K]	0.54	0.33
Alpha value* [%]	7.24	28.43

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

Building Use

% Area	Building Type
80	A1/A2 Retail/Financial and Professional services A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways B1 Offices and Workshop businesses B2 to B7 General Industrial and Special Industrial Groups
20	B8 Storage or Distribution C1 Hotels C2 Residential Institutions: Hospitals and Care Homes C2 Residential Institutions: Residential schools C2 Residential Institutions: Universities and colleges C2A Secure Residential Institutions Residential spaces D1 Non-residential Institutions: Community/Day Centre D1 Non-residential Institutions: Libraries, Museums, and Galleries D1 Non-residential Institutions: Education D1 Non-residential Institutions: Primary Health Care Building D1 Non-residential Institutions: Crown and County Courts D2 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	47.49	41.09
Cooling	0	0
Auxiliary	10.34	7.94
Lighting	12.78	33.39
Hot water	18.31	22.24
Equipment*	35.11	35.11
TOTAL **	88.92	104.66

* 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	548.16	282.28
Primary energy* [kWh/m ²]	137.43	187.66
Total emissions [kg/m ²]	14	22.9

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

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] Central heating using air distribution, [HS] LTHW boiler, [HFT] Biomass, [CFT] Natural Gas										
	Actual	150.7	698.2	64.9	0	16.9	0.65	0	0.85	0
	Notional	66.8	182.8	29.5	0	13.9	0.63	0	----	----
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [HFT] Biomass, [CFT] Natural Gas										
	Actual	79.4	150.8	29.1	0	3.4	0.76	0	0.85	0
	Notional	121.1	195.8	53.4	0	1.6	0.63	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

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.22	Garden Centre - Sales_W_6
Floor	0.2	0.18	Garden Centre - Sales_S_3
Roof	0.15	0.14	Garden Centre - Warehouse_R_11
Windows, roof windows, and rooflights	1.5	2	Garden Centre - Sales_G_7
Personnel doors	1.5	1.8	Garden Centre - Sales_D_13
Vehicle access & similar large doors	1.5	1.5	Garden Centre - Warehouse_D_4
High usage entrance doors	1.5	1.8	Garden Centre - Sales_D_8
U _{i-Typ} = Typical individual element U-values [W/(m²K)]		U _{i-Min} = Minimum individual element U-values [W/(m²K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	5