

Project name

10871 - Car Showroom - 10% Renewables As designed

Date: Thu Sep 10 11:41:33 2020

Administrative information

Building Details

Address: ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.1

Interface to calculation engine: iSBEM

Interface to calculation engine version: v5.6.a

BRUKL compliance check version: v5.6.a.1

Owner Details

Name: Information not provided by the user

Telephone number: Information not provided by the user

Address: Information not provided by the user, Information not provided by the user, Information not provided by the user

Certifier details

Name: Tracey Walsh

Telephone number: 0113 2588445

Address: C80 Solutions Ltd, Sanderson House, 22 Station Road, Horsforth, LS18 5NT

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	29.9
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	29.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	26.9
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	0.35	0.35	ZO/01 - Stairs/n
Floor	0.25	0.25	0.25	ZO/01 - Stairs/f
Roof	0.25	0.25	0.25	ZO/06 - Vauxhall Sales/c
Windows***, roof windows, and rooflights	2.2	2.2	2.2	ZO/01 - Stairs/n/g
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"
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- AC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	2.6	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					

1- Default HWS

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.019
Standard value	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
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 supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]										HR efficiency	
	A	B	C	D	E	F	G	H	I	Zone	Standard	
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
ZO/02 - WCs	-	1.1	-	-	-	-	-	-	-	-	N/A	

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
ZO/03 - Elec Room	220	-	-	20
ZO/05 - Stairs	-	265	-	62
Z1/04 - Tool Store	94	-	-	676
ZO/01 - Stairs	-	380	-	38
ZO/02 - WCs	-	215	-	156
ZO/04 - All offices	203	-	-	416
ZO/06 - Vauxhall Sales	-	382	22	2654
ZO/07 - Lobby x2	-	764	22	31
ZO/08 - Parts	97	-	-	509
ZO/09 - Workshop Control	273	-	-	57

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
Z1/01 - Stairs & Corridor		-	213	-	384
Z1/02 - Comms		254	-	-	58
Z1/03 - Meeting		228	-	-	79

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?
ZO/01 - Stairs	NO (-88.2%)	NO
ZO/02 - WCs	N/A	N/A
ZO/04 - All offices	N/A	N/A
ZO/06 - Vauxhall Sales	NO (-29.7%)	NO
ZO/07 - Lobby x2	NO (-45.8%)	NO
ZO/08 - Parts	NO (-96.7%)	NO
ZO/09 - Workshop Control	N/A	N/A
Z1/01 - Stairs & Corridor	N/A	N/A
Z1/02 - Comms	N/A	N/A
Z1/03 - Meeting	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?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	1149.8	1149.8
External area [m ²]	2593.2	2593.2
Weather	SOU	SOU
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	1475.65	656.68
Average U-value [W/m ² K]	0.57	0.25
Alpha value* [%]	43.57	9.36

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

Building Use

% Area	Building Type
91	A1/A2 Retail/Financial and Professional services A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
9	B1 Offices and Workshop businesses B2 to B7 General Industrial and Special Industrial Groups 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	24.1	6.09
Cooling	4.1	8.87
Auxiliary	0.2	0.17
Lighting	26.31	42.77
Hot water	2.23	1.87
Equipment*	19.39	19.39
TOTAL**	56.95	59.77

* 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	5.06	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]	265.06	160.1
Primary energy* [kWh/m ²]	174.83	175.37
Total emissions [kg/m ²]	26.9	29.9

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

HVAC Systems Performance

System Type	Heat dem MJ/m ²	Cool dem MJ/m ²	Heat con kWh/m ²	Cool con kWh/m ²	Aux con kWh/m ²	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling									
Actual	102.8	56.3	0	0	0	0	0	0	0
Notional	91.6	33.5	0	0	0	0	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	242	43.9	28.9	4.9	0.2	2.33	2.49	2.5	3.5
Notional	63.8	103.2	7.3	10.6	0.2	2.43	2.7	----	----

Key to terms

Heat dem [MJ/m ²]	= Heating energy demand
Cool dem [MJ/m ²]	= Cooling energy demand
Heat con [kWh/m ²]	= Heating energy consumption
Cool con [kWh/m ²]	= Cooling energy consumption
Aux con [kWh/m ²]	= 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	0.35	ZO/01 - Stairs/n
Floor	0.2	0.25	ZO/01 - Stairs/f
Roof	0.15	0.25	ZO/06 - Vauxhall Sales/c
Windows, roof windows, and rooflights	1.5	2.2	ZO/01 - Stairs/n/g
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{i-Typ} = Typical individual element U-values [W/(m ² K)]		U _{i-Min} = Minimum individual element U-values [W/(m ² K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m ³ /(h.m ²) at 50 Pa	5	5