

BRUKL Output Document



HM Government

Compliance with England Building Regulations Part L 2021

Project name

123 Uxbridge Road

As designed

Date: Fri Sep 27 19:02:09 2024

Administrative information

Building Details

Address: 123, Uxbridge Road, Hillingdon, Uxbridge, UB10 0LQ

Certifier details

Name: Joshua Cunningham

Telephone number: 07757 804 531

Address: Ford Street Aldham, Colchester, CO6 3PH

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]: 175.49

The CO₂ emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO ₂ emission rate (TER), kgCO ₂ /m ² :annum	4.54
Building CO ₂ emission rate (BER), kgCO ₂ /m ² :annum	9.29
Target primary energy rate (TPER), kWh _{PE} /m ² :annum	44.45
Building primary energy rate (BPER), kWh _{PE} /m ² :annum	94.25
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	0.26	0.3	GF - Circulation_W_16
Floors	0.18	0.16	0.16	GF - Circulation_S_15
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.16	0.16	GF - Circulation_R_4
Windows** and roof windows	1.6	1.2	1.2	GF - Circulation_G_6
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	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Direct Acting Boiler

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Instant Water Heating

	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		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
GF - WCs	0.3	-	-	-	-	-	-	-	-	-	N/A
FF - WC	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name	Standard value	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
GF - Circulation	110	-	-	-
GF - Lobby	110	-	-	-
GF - WCs	110	-	-	-
GF - Circulation 2	110	-	-	-
GF - Wash Area	110	-	-	-
GF - Main Hall	110	-	-	-
FF - Multipurpose Hall	110	-	-	-
FF - Circulation	110	-	-	-
FF - Office	110	-	-	-

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
FF - Storage	110	-	-
FF - WC	110	-	-

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?
GF - Main Hall	NO (-67.4%)	NO
FF - Multipurpose Hall	NO (-63.3%)	NO
FF - Office	NO (-87.6%)	NO

Regulation 25A: Consideration of high efficiency 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?	YES
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters		Building Use	
	Actual	Notional	% Area Building Type
Floor area [m ²]	351	351	Retail/Financial and Professional Services
External area [m ²]	801.4	801.4	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON	Offices and Workshop Businesses
Infiltration [m ³ /hm ² @ 50Pa]	5	3	General Industrial and Special Industrial Groups
Average conductance [W/K]	216.93	302.15	Storage or Distribution
Average U-value [W/m ² K]	0.27	0.38	Hotels
Alpha value* [%]	30.89	35.42	Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging			
		100	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	54.06	34.12
Cooling	0	0
Auxiliary	2.47	1.5
Lighting	8.76	6.8
Hot water	2.99	2.99
Equipment*	7.33	7.33
TOTAL**	68.29	45.41

* 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	8.45	16.69
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>8.45</i>	<i>16.69</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	206.43	221.54
Primary energy [kWh _{PE} /m ²]	94.25	44.45
Total emissions [kg/m ²]	9.29	4.54

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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas									
Actual	173.6	32.8	54.1	0	2.5	0.89	0	1	0
Notional	164.6	57	34.1	0	1.5	1.34	0	----	----

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 SSEEF	= 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