

Project name

Shell and Core

Unit R2

As designed

Date: Mon Jan 17 12:28:46 2022

Administrative information

Building Details

Address: Tottenham Hale, London, N17

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.b.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v6.1.8

BRUKL compliance check version: v5.6.b.0

Certifier details

Name: Jonathan Wilson

Telephone number: 01892 315 466

Address: Energytest (Commercial) Ltd, 4 St John's Road
Tunbridge Wells, Kent TN4 9NPCriterion 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	74
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	74
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	62.2
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	"GF - Unit R2_W_7"
Floor	0.25	0.15	0.15	"GF - Unit R2 fit-out staff_S_8"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.4	1.4	"GF - Unit R2_G_8"
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	3

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- Air-conditioning units

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.35	3.4	-	-	-
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					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.					

2- Electric heaters

	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- District Heating - Hot water cylinder

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.014
Standard value	N/A	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	
ID of system type	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			
GF - Unit R2 fit-out kitchen	-	-	-	-	-	-	-	-	1	-	-	N/A
GF - Unit R2	-	-	-	1.5	-	-	-	-	-	-	0.65	0.5
GF - Unit R2 fit-out toilets	-	-	0.5	-	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
GF - Unit R2 fit-out staff	YES
GF - Unit R2 fit-out circulation 1	YES
GF - Unit R2 fit-out store room	YES
GF - Unit R2 fit-out circulation	YES
GF - Unit R2 fit-out kitchen	YES
GF - Unit R2	NO

Shell and core configuration

Zone	Assumed shell?
GF - Unit R2 fit-out toilets	YES

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
GF - Unit R2 fit-out staff		100	-	-	92
GF - Unit R2 fit-out circulation 1		-	100	-	11
GF - Unit R2 fit-out store room		100	-	-	17
GF - Unit R2 fit-out circulation		-	100	-	11
GF - Unit R2 fit-out kitchen		-	100	-	164
GF - Unit R2		-	100	100	170
GF - Unit R2 fit-out toilets		-	100	-	54

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?
GF - Unit R2 fit-out staff	N/A	N/A
GF - Unit R2 fit-out circulation 1	N/A	N/A
GF - Unit R2 fit-out store room	N/A	N/A
GF - Unit R2 fit-out circulation	N/A	N/A
GF - Unit R2 fit-out kitchen	N/A	N/A
GF - Unit R2	NO (-31.1%)	NO

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?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	104.2	104.2
External area [m ²]	152.1	152.1
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	54.26	56.81
Average U-value [W/m ² K]	0.36	0.37
Alpha value* [%]	17.45	12.5

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

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
100	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	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	6.21	5.7
Cooling	23.91	30.34
Auxiliary	17.4	8.49
Lighting	32.59	59.31
Hot water	103.59	74.17
Equipment*	104.08	104.08
TOTAL **	183.7	178.01

* 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	18.82	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]	384.34	446.46
Primary energy* [kWh/m ²]	370.25	397.07
Total emissions [kg/m ²]	62.2	74

* 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] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	71.2	330.5	4.9	25.9	17.4	4.05	3.55	4.35	5
	Notional	40.2	425.2	4.6	32.8	7.5	2.43	3.6	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	65.1	106.5	22.6	0	17.3	0.8	0	1	0
	Notional	57	156.8	19.3	0	20.8	0.82	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	"GF - Unit R2_W_7"
Floor	0.2	0.15	"GF - Unit R2 fit-out staff_S_8"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.4	"GF - Unit R2_G_8"
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/(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	3