

Project name

Shell and Core

Unit R3

As designed

Date: Mon Jan 17 12:35:41 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	80.7
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	80.7
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	63.6
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 R3_W_4"
Floor	0.25	0.15	0.15	"GF - Unit R3 fit-out toilets_S_8"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.4	1.4	"GF - Unit R3_G_5"
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- Boiler - radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	-	-	-
Standard value	0.91*	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 gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

2- 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.					

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 R3 fit-out toilets	-	-	0.5	-	-	-	-	-	-	-	-	N/A
GF - Unit R3 fit-out kitchen	-	-	-	-	-	-	-	-	1	-	-	N/A
GF - Unit R3 fit-out bar servery	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
GF - Unit R3	-	-	-	1.5	-	-	-	-	-	0.65	0.5	

Shell and core configuration

Zone	Assumed shell?
GF - Unit R3 fit-out toilets	YES
GF - Unit R3 fit-out circulation	YES
GF - Unit R3 fit-out kitchen	YES

Shell and core configuration

Zone	Assumed shell?
GF - Unit R3 fit-out store room	YES
GF - Unit R3 fit-out staff	YES
GF - Unit R3 fit-out bar servery	YES
GF - Unit R3	NO

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
		60	60	22	
GF - Unit R3 fit-out toilets		-	100	-	54
GF - Unit R3 fit-out circulation		-	100	-	12
GF - Unit R3 fit-out kitchen		-	100	-	64
GF - Unit R3 fit-out store room		100	-	-	11
GF - Unit R3 fit-out staff		100	-	-	89
GF - Unit R3 fit-out bar servery		-	100	100	18
GF - Unit R3		-	100	100	137

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 R3 fit-out staff	N/A	N/A
GF - Unit R3 fit-out bar servery	N/A	N/A
GF - Unit R3	NO (-26%)	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]	71.6	71.6
External area [m ²]	157.8	157.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	75.61	76.7
Average U-value [W/m ² K]	0.48	0.49
Alpha value* [%]	18.2	15.2

* 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	16.82	18.17
Cooling	19.95	25.68
Auxiliary	17.62	8.6
Lighting	35.61	63.47
Hot water	114.34	82.4
Equipment*	95.25	95.25
TOTAL **	204.33	198.33

* 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	27.4	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]	473.67	539.47
Primary energy* [kWh/m ²]	399.02	433.04
Total emissions [kg/m ²]	63.6	80.7

* 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 water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Natural Gas										
	Actual	71	200.5	24.3	0	13.2	0.81	0	0.91	0
	Notional	66.4	278.8	22.5	0	11.3	0.82	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	193.6	375.8	13.3	29.4	19.7	4.05	3.55	4.35	5
	Notional	140.9	490.6	16.1	37.9	7.3	2.43	3.6	----	----

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 R3_W_4"
Floor	0.2	0.15	"GF - Unit R3 fit-out toilets_S_8"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.4	"GF - Unit R3_G_5"
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