BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Unit 2 Roselands 4 Middleton Road

As designed

Date: Thu Jan 24 14:04:20 2019

Administrative information

Building Details

Address: Unit 1 Roselands 4 Middleton Road, ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.4.b.0

Interface to calculation engine: G-ISBEM

Interface to calculation engine version: v22.0

BRUKL compliance check version: v5.4.b.0

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: BRITISH EPC

Telephone number: 08451 305 650

Address: Suite 129 77 Beak Street, London, W1F 9DB

Criterion 1: The calculated CO_2 emission rate for the building must not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	33.1
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	33.1
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	32.1
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.16	0.16	z0/Bed1/s
Floor	0.25	0.16	0.18	z0/Bed1/f
Roof	0.25	0.16	0.16	z1/Bed2/c
Windows***, roof windows, and rooflights	2.2	1.6	1.6	z0/Bed1/s/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"

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values $[W/(m^2K)]$

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values $[W/(m^2K)]$

$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values $[W/(m^2K)]$

* 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	10

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- Rads

	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.

1- Hot water

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	Hot water provided by HVAC system	-
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**		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	**Zone**	**Standard**
z0/Store1	-	-	-	-	-	-	-	-	-	-	N/A
z0/Bed1	-	-	-	-	-	-	-	-	-	-	N/A
z1/Bed2	-	-	-	-	-	-	-	-	-	-	N/A
z0/DomLounge1	-	-	-	-	-	-	-	-	-	-	N/A
z1/DomLounge1	-	-	-	-	-	-	-	-	-	-	N/A
z0/Bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
z1/Bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
z0/CellOff1	-	-	-	-	-	-	-	-	-	-	N/A
z1/CellOff1	-	-	-	-	-	-	-	-	-	-	N/A
z0/MeetRm1	-	-	-	-	-	-	-	-	-	-	N/A
z1/MeetRm1	-	-	-	-	-	-	-	-	-	-	N/A
z0/Toilet1	0.3	-	-	-	-	-	-	-	-	-	N/A
z1/Toilet1	0.3	-	-	-	-	-	-	-	-	-	N/A
z0/Tea1	0.3	-	-	-	-	-	-	-	-	-	N/A
z1/Tea1	0.3	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
z1/Store1	-	-	-	-	-	-	-	-	-	-	N/A
z0/CircPub1	-	-	-	-	-	-	-	-	-	-	N/A
z1/CircPub1	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
z0/Store1	65	-	-	10
z0/Bed1	-	65	-	50
z1/Bed2	-	65	-	50
z0/DomLounge1	-	65	-	64
z1/DomLounge1	-	65	-	64
z0/Bath1	-	65	-	23
z1/Bath1	-	65	-	23
z0/CellOff1	65	-	-	140
z1/CellOff1	65	-	-	140
z0/MeetRm1	65	-	-	149
z1/MeetRm1	65	-	-	149
z0/Toilet1	-	65	-	36
z1/Toilet1	-	65	-	36
z0/Tea1	-	65	-	41
z1/Tea1	-	65	-	41
z1/Store1	65	-	-	10
z0/CircPub1	-	65	-	82
z1/CircPub1	-	65	-	82

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?
z0/Bed1	NO (-69.4%)	NO
z1/Bed2	NO (-69.4%)	NO
z0/DomLounge1	NO (-80.3%)	NO
z1/DomLounge1	NO (-80.3%)	NO
z0/CellOff1	NO (-69.4%)	NO
z1/CellOff1	NO (-69.4%)	NO
z0/MeetRm1	NO (-80.3%)	NO
z1/MeetRm1	NO (-80.3%)	NO
z0/Tea1	NO (-61.7%)	NO
z1/Tea1	NO (-61.7%)	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?	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]	218.4	218.4
External area [m^2]	446.3	446.3
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	10	5
Average conductance [W/K]	102.52	225.07
Average U-value [W/m^2K]	0.23	0.5
Alpha value* [%]	19.65	19.55

* 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
	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
86	**C2 Residential Institutions: Hospitals and Care Homes**
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
14	**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/m^2]

	Actual	Notional
Heating	36.29	55.54
Cooling	0	0
Auxiliary	5.62	4.98
Lighting	20.65	15.89
Hot water	49	49
Equipment*	46.52	46.52
TOTAL**	**111.56**	**125.4**

* 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/m^2]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	285.25	371.76
Primary energy* [kWh/m^2]	184.71	189.99
Total emissions [kg/m^2]	32.1	33.1

* 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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	27.4	86.2	0	0	0	0	0	0	0
	Notional	22.1	70.8	0	0	0	0	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	106.5	179.5	36.4	0	5.6	0.81	0	0.91	0
	Notional	164.5	208.5	55.8	0	5	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	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.16	z0/Bed1/s
Floor	0.2	0.12	z0/CircPub1/f
Roof	0.15	0.16	z1/Bed2/c
Windows, roof windows, and rooflights	1.5	1.6	z0/Bed1/s/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"

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = 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	10