BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

1012395_KentishTownRoad_Planning_001

As designed

Date: Wed Mar 02 10:23:35 2016

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.2

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.2

BRUKL compliance check version: v5.2.b.1

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2$.annum	34.6
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	34.6
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	29.4
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

Values which do not meet standards in the 2013 Non-Domestic Building Services Compliance Guide are displayed in red.

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	BS00000B:Surf[1]
Floor	0.25	0.25	0.25	BS00000B:Surf[12]
Roof	0.25	-	-	UNKNOWN
Windows***, roof windows, and rooflights	2.2	1.6	1.6	BS00000B:Surf[0]
Personnel doors	2.2	-	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = 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	5

2.b 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	YES
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- VRF

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	4	0	2.7	0.89
Standard value	2.5*	3.2	N/A	1.6	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

* 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- DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	0.95	-
Standard value	0.9*	N/A

* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.

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		
Basement Perim	-	-	-	0.8	-	-	-	2.7	-	-	N/A
Basement Perim	-	-	-	0.8	-	-	-	2.7	-	-	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	
Basement Perim	70	-	-	433
Basement Perim	70	-	-	510

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?
Basement Perim	NO (-13.3%)	NO
Basement Perim	NO (-82.6%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the 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?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	87	87
External area [m²]	145	145
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	5
Average conductance [W/K]	78.22	34.21
Average U-value [W/m²K]	0.54	0.24
Alpha value* [%]	10	10

* 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
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
100	**D1 Non-residential Inst.: Primary Health Care Building**
	D1 Non-residential Inst.: 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	9.69	4.38
Cooling	4.37	5.03
Auxiliary	20.44	13.37
Lighting	21.19	43.94
Hot water	3.85	3.82
Equipment*	36.09	36.09
TOTAL**	**59.54**	**70.54**

* Energy used by equipment does not count towards the total for 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	182.85	109.05
Primary energy* [kWh/m²]	203.39	217.49
Total emissions [kg/m²]	29.4	34.6

* 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] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	136.7	46.2	9.7	4.4	20.4	3.92	2.94	4	4
	Notional	40.4	68.7	4.4	5	13.4	2.56	3.79	----	----

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 BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	U_{i-Typ}	U_{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.2	BS00000B:Surf[1]
Floor	0.2	0.25	BS00000B:Surf[12]
Roof	0.15	-	UNKNOWN
Windows, roof windows, and rooflights	1.5	1.6	BS00000B:Surf[0]
Personnel doors	1.5	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	5