BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

30 - 38 Chester Road

As designed

Date: Mon October 26 15:18:42 2020

Administrative information

Building Details

Address: 30-32 Chester Road, Northwood, HARROW, HA6 1BQ

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.4.a.1

Interface to calculation engine: Lifespan SBEM

Interface to calculation engine version: v5.4.a

BRUKL compliance check version: v5.4.a.1

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: Mark Simons

Telephone number: 020 8930 5668

Address: 17 Dobree Avenue, London, NW10 2AD

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

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	75.6
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	75.6
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	13.3
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	0.27	0.3	bf/01 /South/Wall-Internal
Floor	0.25	0.14	0.19	bf/07 plant/Floor-External
Roof	0.25	0.15	0.15	sf/01 bedroom/Roof
Windows***, roof windows, and rooflights	2.2	1.4	1.4	bf/02 kitchen/South/Wall-External/Glazing
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	5

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- Vaillant ecoTEC Plus

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	0.95	-	-	-	-
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- Boiler >>> Cylinder 600 L

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	Hot water provided by HVAC system	0.001
Standard value	N/A	N/A

1- chp

	CHPQA quality index	**CHP electrical efficiency**
This building	-	32
Standard value	Not provided	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**
bf/08 store	-	-	-	-	-	-	-	-	-	-	N/A
bf/01 circulations	-	-	-	-	-	-	-	-	-	-	N/A
bf/02 kitchen	1.5	-	-	-	-	-	-	-	-	-	N/A
bf/03 activity lounge	-	-	-	-	-	-	-	-	-	-	N/A
bf/04 shower changing facility	1.5	-	-	-	-	-	-	-	-	-	N/A
bf/05 staff room	-	-	-	-	-	-	-	-	-	-	N/A
bf/06 staff changing room	-	-	-	-	-	-	-	-	-	-	N/A
bf/07 plant	-	-	-	-	-	-	-	-	-	-	N/A
bf/09 toilets	1.5	-	-	-	-	-	-	-	-	-	N/A
gf/01 circulations	-	-	-	-	-	-	-	-	-	-	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
gf/02 lounge area	-	-	-	-	-	-	-	-	-	-	N/A
gf/03 wc	-	-	-	-	-	-	-	-	-	-	N/A
gf/04 bedroom front	-	-	-	-	-	-	-	-	-	-	N/A
gf/05 bedroom front	-	-	-	-	-	-	-	-	-	-	N/A
gf/06 bedroom	-	-	-	-	-	-	-	-	-	-	N/A
ff/01 bedroom	-	-	-	-	-	-	-	-	-	-	N/A
ff/02 circulation	-	-	-	-	-	-	-	-	-	-	N/A
ff/03 store	-	-	-	-	-	-	-	-	-	-	N/A
ff/04 bathroom	-	-	-	-	-	-	-	-	-	-	N/A
ff/05 bedroom	-	-	-	-	-	-	-	-	-	-	N/A
ff/06 bedroom rear	-	-	-	-	-	-	-	-	-	-	N/A
sf/01 bedroom	-	-	-	-	-	-	-	-	-	-	N/A
sf/02 circulation	-	-	-	-	-	-	-	-	-	-	N/A
sf/03 store	-	-	-	-	-	-	-	-	-	-	N/A
sf/04 bathroom	-	-	-	-	-	-	-	-	-	-	N/A
sf/05 bedroom	-	-	-	-	-	-	-	-	-	-	N/A
sf/06 bedroom rear	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
bf/08 store	89	-	-	100
bf/01 circulations	-	196	-	80
bf/02 kitchen	-	319	-	120
bf/03 activity lounge	-	338	-	75
bf/04 shower changing facility	-	232	-	15
bf/05 staff room	-	167	-	75
bf/06 staff changing room	-	100	-	30
bf/07 plant	217	-	-	10
bf/09 toilets	-	385	-	10
gf/01 circulations	-	183	-	150
gf/02 lounge area	-	190	-	230
gf/03 wc	-	376	-	15
gf/04 bedroom front	-	197	-	70
gf/05 bedroom front	-	197	-	70
gf/06 bedroom	-	175	-	75
ff/01 bedroom	-	251	-	150
ff/02 circulation	-	191	-	120
ff/03 store	211	-	-	10
ff/04 bathroom	-	185	-	70
ff/05 bedroom	-	170	-	75
ff/06 bedroom rear	-	192	-	130
sf/01 bedroom	-	251	-	150

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
sf/02 circulation	-	190	-	120
sf/03 store	210	-	-	10
sf/04 bathroom	-	216	-	60
sf/05 bedroom	-	182	-	70
sf/06 bedroom rear	-	357	-	70

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?
bf/03 activity lounge	NO (-38.1%)	NO
bf/05 staff room	N/A	N/A
gf/02 lounge area	NO (-42.1%)	NO
gf/04 bedroom front	NO (-70.1%)	NO
gf/05 bedroom front	NO (-70.1%)	NO
gf/06 bedroom	NO (-72.2%)	NO
ff/01 bedroom	NO (-78.1%)	NO
ff/05 bedroom	NO (-72%)	NO
ff/06 bedroom rear	NO (-72%)	NO
sf/01 bedroom	NO (-80.6%)	NO
sf/05 bedroom	NO (-75.8%)	NO
sf/06 bedroom rear	NO (-72%)	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]	1146.6	1146.6
External area [m^2]	1333.8	1333.8
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	5	3
Average conductance [W/K]	381.12	611.22
Average U-value [W/m^2K]	0.29	0.46
Alpha value* [%]	22.03	19.56

* 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
100	**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/m^2]

	Actual	Notional
Heating	19.27	45.56
Cooling	0	0
Auxiliary	14.7	4.78
Lighting	8.15	11.96
Hot water	130.41	265.16
Equipment*	56.38	56.38
TOTAL**	**120.21**	**327.46**

* 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	7.18	0
Wind turbines	0	0
CHP generators	52.31	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	364.6	392.3
Primary energy* [kWh/m^2]	92.13	429.18
Total emissions [kg/m^2]	13.3	75.6

* 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] No Heating or Cooling										
	Actual	36.4	36.6	0	0	0	0	0	0	0
	Notional	37.4	30.8	0	0	0	0	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	60.2	254.1	19.7	0	15.2	0.85	0	0.95	0
	Notional	138.9	264.4	47.1	0	4.9	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	0.27	bf/01 /North/Wall-Internal
Floor	0.2	0.08	gf/01 circulations/Floor-External
Roof	0.15	0.15	sf/01 bedroom/Roof
Windows, roof windows, and rooflights	1.5	1.4	bf/02 kitchen/South/Wall-External/Glazing
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	5