BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Chester Road - AG

As designed

Date: Mon Jun 17 17:31:26 2024

Administrative information

Building Details

Address: Chester Road, London,

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.b.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

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

Certifier details

Name: Cory Skrzypkowski

Telephone number: 01159 754141

Address: Unit C4, Park Lane Business Centre, Basford, NG6 0DW

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

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	10.6
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	10.6
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	2.1
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	0.14	1	"RV000047_W1_O1"
Floor	0.25	0.11	0.11	"RV00000F_F"
Roof	0.25	0.11	0.11	"RV00000F_C_A0"
Windows***, roof windows, and rooflights	2.2	0.9	0.9	"RV00000F_W3_O0"
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	4

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	>0.95

1- Main - VRF PURY-EM200/250YNW-A1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	5.8	4.05	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
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.

2- Elec UFH - E

	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					YES

1- SYST0016-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	4.3	0.038
Standard value	1	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
A0 - Common Room	-	-	-	1.6	-	-	-	-	-	0.8	0.5
A0 - Interview Room	-	-	-	1.6	-	-	-	-	-	0.8	0.5
A0 - Office	-	-	-	1.6	-	-	-	-	-	0.8	0.5
A0 - Reception	-	1.6	-	-	-	-	-	-	-	-	N/A
B0 - Circulation	-	1.6	-	-	-	-	-	-	-	-	N/A
B0 - Staff Room	-	-	-	1.6	-	-	-	-	-	0.8	0.5
Stairs	-	1.6	-	-	-	-	-	-	-	-	N/A
A0 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
B0 - Changing Room	-	-	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
B0 - Staff Bathroom	-	-	0.3	-	-	-	-	-	-	-	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	
00 - Refuse Store Block C	128	-	-	16
00 - Stairwell	-	109	-	22
00 - Store	128	-	-	6
01 - Stairwell	-	109	-	22
01 - Stairwell	-	109	-	19
01 - Store	128	-	-	6
02 - Store	128	-	-	6
02- Stairwell	-	109	-	22
02- Stairwell	-	109	-	19
03 - Stairwell	-	109	-	22
B0 - Cleaner Cupboard	128	-	-	6
B0 - Cleaner Cupboard	128	-	-	7
B0 - Electric Meter Room	128	-	-	4
B0 - Electric Meter Room	128	-	-	5
B0 - Electrical Intake Room	128	-	-	6
B0 - Furniture Store	128	-	-	13
B0 - Furniture Store	128	-	-	10
B0 - Hot Water Store Plant Room	128	-	-	8
B0 - Refuse Store Block C	128	-	-	17
B0 - Stairwell	-	109	-	21
B0 - Water Tank Plant Room	128	-	-	15
Store	128	-	-	6
A0 - Common Room	134	-	-	101
A0 - Interview Room	100	-	-	72
A0 - Office	100	-	-	72
A0 - Reception	-	83	83	135
B0 - Circulation	-	109	-	64
B0 - Staff Room	134	-	-	149
Stairs	-	109	-	19
A0 - WC	-	106	-	24
B0 - Changing Room	-	102	-	27
B0 - Staff Bathroom	-	70	-	39

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?
A0 - Common Room	NO (-53.5%)	NO
A0 - Interview Room	NO (-83.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
A0 - Office	NO (-83.2%)	NO
A0 - Reception	NO (-48.8%)	NO
B0 - Circulation	N/A	N/A
B0 - Staff Room	NO (-92.1%)	NO
Stairs	N/A	N/A

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?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	407.9	407.9
External area [m²]	1906.6	1906.6
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	4	3
Average conductance [W/K]	256.51	657.93
Average U-value [W/m²K]	0.13	0.35
Alpha value* [%]	20.65	15.34

* 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
100	**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	3.12	8.5
Cooling	0.8	2.61
Auxiliary	2.44	1.5
Lighting	7.28	9.35
Hot water	0.53	0.56
Equipment*	10.48	10.48
TOTAL**	**14.17**	**22.52**

* 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	8.97	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/m²]	185.03	297.96
Primary energy* [kWh/m²]	39.96	62.09
Total emissions [kg/m²]	2.1	10.6

* 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	194.2	1.6	0	0	0	0	0	0	0
	Notional	264.1	65.1	0	0	0	0	0	---	---
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	103.3	71.1	5	2.3	6.3	5.69	8.5	5.8	11.37
	Notional	155.1	98.3	17.7	7.6	2.7	2.43	3.6	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Natural Gas, [CFT] Electricity										
	Actual	103	9.5	34	0	7	0.84	0	1	0
	Notional	173.9	29.3	59	0	14.1	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	0.13	"RV00000F_W1"
Floor	0.2	0.11	"RV000047_F_A0"
Roof	0.15	0.11	"RV00000F_C_A0"
Windows, roof windows, and rooflights	1.5	0.9	"RV00000F_W3_O0"
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	4