BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Be Lean

As designed

Date: Tue Sep 06 15:16:56 2022

Administrative information

Building Details

Address: 44-46 Hampstead Lane, London, N6 4LL

Certifier details

Name: Ondrej Gajdos

Telephone number: 02080995978

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.c.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.1.2

BRUKL compliance module version: v6.1.c.0

Foundation area [m²]: 731.89

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	8.02	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	6.66	
Target primary energy rate (TPER), $kWh/m^2.annum$	87.21	
Building primary energy rate (BPER), $kWh/m^2.annum$	72.37	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-Limit}}$	$U_{a\text{-Calc}}$	$U_{i\text{-Calc}}$	First surface with maximum value
Walls*	0.26	0.16	0.16	0LG - studios1_W_30
Floors	0.18	0.12	0.13	0LG - cinema_F_8
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.13	0.13	0LG - cinema_R_17
Windows** and roof windows	1.6	1.2	1.3	1st - circ1_G_56
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.5	1.5	00Basement - circ_D_49
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-Limit}}$ = Limiting area-weighted average U-values [W/(m²K)]

$U_{i\text{-Calc}}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-Calc}}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	3

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- Heating&cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	4.92	-	-	-
Standard value	2.5*	5	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.

2- Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	-	-	-
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					YES

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- Project DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.86	0.01
Standard value	2*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
0LG - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios5	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - ofc	-	-	-	-	0.5	-	-	-	-	0.8	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
0UG - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - cafe	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios5	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios6	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios7	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - quiet	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios4	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndB - studios3	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - studios1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - din-lounge	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - studios2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
00Basement - laundry	0.3	-	-	-	-	-	-	-	-	-	N/A
00Basement - kit	-	-	-	-	-	-	-	-	0.6	-	N/A
00Basement - staff	-	-	-	-	0.5	-	-	-	-	0.8	N/A
00Basement - wc	0.3	-	-	-	-	-	-	-	-	-	N/A
00Basement - shwr	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - circ2	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0LG - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
0LG - wc2	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - treat	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - rec	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - din	-	-	-	-	0.5	-	-	-	-	0.8	N/A
0UG - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - wc2	0.3	-	-	-	-	-	-	-	-	-	N/A
0UG - wc3	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
1st - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - din	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - sluice	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - nurse	-	-	-	-	0.5	-	-	-	-	0.8	N/A
1st - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
1st - shower	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndB - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - bath1	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndA - circ1	-	-	-	-	0.5	-	-	-	-	0.8	N/A
2ndA - sluice	0.3	-	-	-	-	-	-	-	-	-	N/A
2ndA - wc1	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
0LG - studios1	110	-	-
0LG - cinema	110	-	-
0LG - din-lounge	110	-	-
0LG - studios2	110	-	-
0LG - studios3	110	-	-
0UG - studios5	110	-	-
0UG - studios1	110	-	-
0UG - ofc	110	-	-
0UG - studios3	110	-	-
0UG - lounge	110	-	-
0UG - studios4	110	-	-
0UG - nurse	110	-	-
0UG - cafe	110	-	-
0UG - studios2	110	-	-
1st - studios1	110	-	-
1st - studios5	110	-	-
1st - studios6	110	-	-
1st - studios7	110	-	-
1st - lounge	110	-	-
1st - quiet	110	-	-
1st - studios3	110	-	-
1st - studios4	110	-	-
1st - din-lounge	110	-	-
1st - studios2	110	-	-
2ndB - nurse	110	-	-
2ndB - studios1	110	-	-
2ndB - din-lounge	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
2ndB - studios2	110	-	-
2ndB - studios4	110	-	-
2ndB - studios3	110	-	-
2ndA - studios1	110	-	-
2ndA - din-lounge	110	-	-
2ndA - studios2	110	-	-
00Basement - laundry	110	-	-
00Basement - plant	110	-	-
00Basement - kit	110	-	-
00Basement - circ	110	-	-
00Basement - st1	110	-	-
00Basement - staff	110	-	-
00Basement - wc	110	-	-
00Basement - st2	110	-	-
00Basement - shwr	110	-	-
00Basement - st3	110	-	-
0LG - quiet	110	-	-
0LG - st7	110	-	-
0LG - drugs	110	-	-
0LG - plant	110	-	-
0LG - circ1	110	-	-
0LG - nurse	110	-	-
0LG - circ2	110	-	-
0LG - wc1	110	-	-
0LG - st2	110	-	-
0LG - st3	110	-	-
0LG - st1	110	-	-
0LG - bath1	110	-	-
0LG - st4	110	-	-
0LG - st5	110	-	-
0LG - wc2	110	-	-
0LG - st6	110	-	-
0UG - treat	110	-	-
0UG - circ1	110	-	-
0UG - st1	110	-	-
0UG - rec	110	50	2.7
0UG - wc1	110	-	-
0UG - din	110	-	-
0UG - bath1	110	-	-
0UG - drugs	110	-	-
0UG - wc2	110	-	-
0UG - st2	110	-	-
0UG - st3	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
0UG - st4	110	-	-
0UG - wc3	110	-	-
1st - circ1	110	-	-
1st - wc1	110	-	-
1st - din	110	-	-
1st - sluice	110	-	-
1st - nurse	110	-	-
1st - bath1	110	-	-
1st - shower	110	-	-
1st - drugs	110	-	-
1st - st1	110	-	-
1st - st2	110	-	-
1st - st3	110	-	-
2ndB - st1	110	-	-
2ndB - circ1	110	-	-
2ndB - st2	110	-	-
2ndB - drugs	110	-	-
2ndA - bath1	110	-	-
2ndA - circ1	110	-	-
2ndA - sluice	110	-	-
2ndA - st1	110	-	-
2ndA - st2	110	-	-
2ndA - wc1	110	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0LG - studios1	NO (-16.4%)	NO
0LG - cinema	N/A	N/A
0LG - din-lounge	NO (-5.3%)	NO
0LG - studios2	NO (-47.6%)	NO
0LG - studios3	NO (-44.8%)	NO
0UG - studios5	NO (-29.1%)	NO
0UG - studios1	NO (-45.4%)	NO
0UG - ofc	NO (-52.1%)	NO
0UG - studios3	NO (-46.7%)	NO
0UG - lounge	NO (-2.5%)	NO
0UG - studios4	NO (-40.8%)	NO
0UG - nurse	N/A	N/A
0UG - cafe	NO (-60.5%)	NO
0UG - studios2	NO (-87%)	NO
1st - studios1	NO (-52.7%)	NO
1st - studios5	NO (-57.8%)	NO
1st - studios6	NO (-61.5%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1st - studios7	NO (-63.4%)	NO
1st - lounge	NO (-50.6%)	NO
1st - quiet	NO (-19.4%)	NO
1st - studios3	NO (-74%)	NO
1st - studios4	NO (-70.4%)	NO
1st - din-lounge	NO (-33.3%)	NO
1st - studios2	NO (-81.1%)	NO
2ndB - nurse	NO (-63.6%)	NO
2ndB - studios1	NO (-83.6%)	NO
2ndB - din-lounge	NO (-64.9%)	NO
2ndB - studios2	NO (-85.7%)	NO
2ndB - studios4	NO (-77.1%)	NO
2ndB - studios3	NO (-68.4%)	NO
2ndA - studios1	NO (-80.1%)	NO
2ndA - din-lounge	NO (-69.9%)	NO
2ndA - studios2	NO (-78.8%)	NO
00Basement - staff	N/A	N/A
0LG - quiet	N/A	N/A
0LG - nurse	N/A	N/A
0UG - treat	NO (-32.5%)	NO
0UG - rec	N/A	N/A
0UG - din	NO (-32.9%)	NO
1st - din	NO (-38.5%)	NO
1st - nurse	NO (-66%)	NO

Regulation 25A: Consideration of high efficiency 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
Floor area [m²]	4391.4	4391.4
External area [m²]	4686.6	4686.6
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	1271.05	1700.03
Average U-value [W/m²K]	0.27	0.36
Alpha value* [%]	87.27	52.66

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
100	**Residential Institutions: Hospitals and Care Homes**
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	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	4.22	4.74
Cooling	7.52	7.69
Auxiliary	7.81	10.02
Lighting	7.14	7.24
Hot water	22.29	29.34
Equipment*	36.16	36.16
TOTAL**	**48.98**	**59.03**

* 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	245.14	212.15
Primary energy [kWh/m²]	72.37	87.21
Total emissions [kg/m²]	6.66	8.02

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] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	44.4	176.9	4.8	13.4	5.9	2.59	3.68	2.64	4.92
	Notional	53.5	132.8	5.6	13.7	8.9	2.64	2.7	----	----
[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Natural Gas										
	Actual	31.5	244.4	3.5	0	10	2.48	0	2.64	0
	Notional	34.2	211.1	3.6	0	10.7	2.64	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