BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

551-557 Finchley Road Green

As designed

Date: Wed Nov 27 10:16:14 2019

Administrative information

Building Details

Address: Address 1, Address 2, City, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.12

BRUKL compliance check version: v5.6.a.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 must not exceed the target

The building does not comply with England Building Regulations Part L 2013

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	75.2
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	75.2
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	75.9
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	0.3	0.3	LG000004_W1
Floor	0.25	0.23	0.25	LG000004_F
Roof	0.25	0.18	0.18	LG000004_C
Windows***, roof windows, and rooflights	2.2	1.8	1.8	GF000002_W-1_O0
Personnel doors	2.2	2.2	2.2	GF000002_W1_O1
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	15

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	>0.95

1- Main system Cooling VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	4	-	-	-
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- Main system No Cooling

	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					YES
* 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.					

3- Main system Cooling VRF Retail

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	4	-	-	-
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.					

1- SYST0001-DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	0.91	-
Standard value	0.8	N/A

2- SYST0000-DHW

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

3- SYST0002-DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
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
LGF Meeting Room	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Gym	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Cafe	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
LGF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Reception	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
3F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
3F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
3F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
3F Apart Hotel	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
4F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
4F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
1F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
2F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
4F Apart Hotel	0.3	-	-	-	-	-	-	-	-	-	N/A
GF Retail	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	
LGF Meeting Room	77	-	-	181
LGF Gym	-	90	-	56
GF Cafe	-	90	30	369
LGF Lift	-	90	-	18
LGF Apart Hotel	-	90	-	77
LGF Apart Hotel	-	90	-	73
LGF Apart Hotel	-	90	-	72
LGF Apart Hotel	-	90	-	72
LGF Apart Hotel	-	90	-	82
LGF Apart Hotel	-	90	-	85
LGF WC	-	90	-	29
LGF WC	-	90	-	31
LGF Stairs	-	90	-	29
LGF Corridor	-	90	-	70
LGF Corridor	-	90	-	68
GF Corridor	-	90	-	146
GF Reception	-	90	30	155
GF Lift	-	90	-	25
GF Apart Hotel	-	90	-	90
GF Apart Hotel	-	90	-	79
GF Apart Hotel	-	90	-	86
GF Stairs	-	90	-	21
GF Lift	-	90	-	25
GF Apart Hotel	-	90	-	85
GF Apart Hotel	-	90	-	90
GF Apart Hotel	-	90	-	81
2F Stairs	-	90	-	36
2F Apart Hotel	-	90	-	85
2F Stairs	-	90	-	44
2F Apart Hotel	-	90	-	64
2F Apart Hotel	-	90	-	83
2F Apart Hotel	-	90	-	68

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
2F Apart Hotel	-	90	-	68
2F Apart Hotel	-	90	-	68
1F Apart Hotel	-	90	-	102
1F Apart Hotel	-	90	-	70
1F Apart Hotel	-	90	-	69
1F Apart Hotel	-	90	-	69
1F Apart Hotel	-	90	-	88
1F Stairs	-	90	-	50
1F Lift	-	90	-	20
1F Stairs	-	90	-	44
3F Apart Hotel	-	90	-	60
3F Apart Hotel	-	90	-	74
3F Apart Hotel	-	90	-	102
3F Corridor	-	90	-	101
3F Apart Hotel	-	90	-	69
3F Lift	-	90	-	17
4F Apart Hotel	-	90	-	69
4F Apart Hotel	-	90	-	67
4F Lift	-	90	-	17
4F Corridor	-	90	-	37
1F Apart Hotel	-	90	-	86
1F Apart Hotel	-	90	-	100
LGF WC	-	90	-	34
2F Apart Hotel	-	90	-	67
2F Lift	-	90	-	16
4F Stairs	-	90	-	20
4F Apart Hotel	-	90	-	75
GF Retail	-	90	30	374

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?
LGF Meeting Room	N/A	N/A
LGF Gym	N/A	N/A
GF Cafe	NO (-39.9%)	NO
LGF Apart Hotel	NO (-76.4%)	NO
LGF Apart Hotel	NO (-25.8%)	NO
LGF Apart Hotel	NO (-35.1%)	NO
LGF Apart Hotel	NO (-35.1%)	NO
LGF Apart Hotel	NO (-35.1%)	NO
LGF Apart Hotel	NO (-35.1%)	NO
GF Reception	NO (-0.4%)	NO
GF Apart Hotel	NO (-88.5%)	NO
GF Apart Hotel	NO (-62.1%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF Apart Hotel	NO (-66.8%)	NO
GF Apart Hotel	NO (-70.5%)	NO
GF Apart Hotel	NO (-70.5%)	NO
GF Apart Hotel	NO (-62.1%)	NO
2F Apart Hotel	NO (-75.8%)	NO
2F Apart Hotel	N/A	N/A
2F Apart Hotel	NO (-90.6%)	NO
2F Apart Hotel	NO (-69.8%)	NO
2F Apart Hotel	NO (-70.7%)	NO
2F Apart Hotel	NO (-70.6%)	NO
1F Apart Hotel	NO (-79%)	NO
1F Apart Hotel	NO (-69.9%)	NO
1F Apart Hotel	NO (-70.6%)	NO
1F Apart Hotel	NO (-70.6%)	NO
1F Apart Hotel	NO (-48.9%)	NO
3F Apart Hotel	NO (-84.5%)	NO
3F Apart Hotel	NO (-89%)	NO
3F Apart Hotel	NO (-73.3%)	NO
3F Apart Hotel	NO (-49.7%)	NO
4F Apart Hotel	NO (-75.7%)	NO
4F Apart Hotel	NO (-74.6%)	NO
1F Apart Hotel	NO (-78.5%)	NO
1F Apart Hotel	NO (-48.9%)	NO
2F Apart Hotel	NO (-91.1%)	NO
4F Apart Hotel	N/A	N/A
GF Retail	NO (-17.4%)	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]	1571.1	1571.1
External area [m^2]	1746	1746
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	15	3
Average conductance [W/K]	734.84	899.78
Average U-value [W/m^2K]	0.42	0.52
Alpha value* [%]	21.72	18.34

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

Building Use

% Area	Building Type
2	**A1/A2 Retail/Financial and Professional services**
6	**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
92	**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/m^2]

	Actual	Notional
Heating	72.04	59.49
Cooling	2.13	2.65
Auxiliary	5.94	4.34
Lighting	9.79	14.36
Hot water	234.31	234.75
Equipment*	18.11	18.11
TOTAL**	**324.21**	**315.6**

* 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]	305.81	300.07
Primary energy* [kWh/m^2]	431.7	427.89
Total emissions [kg/m^2]	75.9	75.2

* 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] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	397.3	239.4	28.1	22.2	1.5	3.92	2.99	4	4
	Notional	281.1	358	32.1	27.6	2	2.43	3.6	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	237.7	37.1	77.2	0	6.4	0.86	0	0.91	0
	Notional	185.6	82.2	63	0	4.6	0.82	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	125.1	178.2	8.9	16.6	1	3.92	2.99	4	4
	Notional	58.8	268.8	6.7	20.7	1.3	2.43	3.6	----	----

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	0.28	LG000008_W1
Floor	0.2	0.22	GF000002_F
Roof	0.15	0.18	LG000004_C
Windows, roof windows, and rooflights	1.5	1.8	GF000002_W-1_O0
Personnel doors	1.5	2.2	GF000002_W1_O1
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	15