

Project name

798 High Road**As designed**

Date: Thu Feb 20 12:00:27 2020

Administrative information

Building Details

Address: 798 High Road, London,

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.1

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v6.1.0

BRUKL compliance check version: v5.6.a.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name: Darryl Vardill

Telephone number: 07767687416

Address: 77 Cudham Lane North, Orpington, BR66BY

Criterion 1: The calculated CO₂ 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	21.3
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	21.3
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	37.7
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 -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	1.47	1.96	Block 1_Basement - 798_B_01_Stair_P_7
Floor	0.25	1.07	2.07	Block 2_Ground - 798_G_03_Reception_F_6
Roof	0.25	2.13	2.13	Block 1_Basement - 798_B_01_Stair_R_5
Windows***, roof windows, and rooflights	2.2	1.8	1.8	Block 3_First - 798_F_01_Stair_G_7
Personnel doors	2.2	2.82	2.82	Block 2_Ground - 798_G_01_Hall_D_13
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 -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* 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	25

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- 800 HR Boilers RADS

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.96	-	-	-	-
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.					

2- 800 HR Elec UF

	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					NO

3- 800 HR Heat Pumps

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.1	3.65	-	-	-
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- 800 HR DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.012
Standard value	N/A	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		Zone	Standard
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
Block 1_Basement - 798_B_04_Toilets	-	-	-	1.6	-	-	-	-	-		0.78	0.5
Block 2_Ground - 798_G_04_Dis WC	-	-	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	
Block 1_Basement - 798_B_08 Incoming Services	100	-	-	20
Block 1_Basement - 798_B_03_ Plant room	140	-	-	23
Block 1_Basement - 798_B_07_Store	80	-	-	7
Block 1_Basement - 798_B_01_Stair	-	100	-	23
Block 1_Basement - 798_B_04_Toilets	-	100	-	68
Block 3_First - 798_F_01_Stair	-	100	-	25
Block 3_First - 798_F_02_Room 3	100	-	-	55
Block 4_Second - 798_S_01_Stair	100	-	-	98
Block 2_Ground - 798_G_04_Dis WC	100	-	-	72
Block 1_Basement - 798_B_02_Break Out	-	100	-	53
Block 2_Ground - 798_G_03_Reception	-	100	15	94
Block 2_Ground - 798_G_01_Hall	-	100	-	37
Block 2_Ground - 798_G_02_Meeting Rm	100	-	-	156
Block 3_First - 798_F_04_Room 2	100	-	-	132
Block 3_First - 798_F_03_Room 1	100	-	-	152
Block 4_Second - 798_S_04_Room 2	100	-	-	132
Block 4_Second - 798_S_03_Room 1	100	-	-	132
Block 4_Second - 798_S_02_Room 3	100	-	-	81

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?
Block 3_First - 798_F_02_Room 3	NO (-31.3%)	NO
Block 4_Second - 798_S_01_Stair	NO (-16.2%)	NO
Block 2_Ground - 798_G_04_Dis WC	N/A	N/A
Block 1_Basement - 798_B_02_Break Out	NO (-34.3%)	NO
Block 2_Ground - 798_G_03_Reception	YES (+106.5%)	NO
Block 2_Ground - 798_G_01_Hall	N/A	N/A
Block 2_Ground - 798_G_02_Meeting Rm	NO (-42.3%)	NO
Block 3_First - 798_F_04_Room 2	NO (-59.7%)	NO
Block 3_First - 798_F_03_Room 1	NO (-41.4%)	NO
Block 4_Second - 798_S_04_Room 2	NO (-59.7%)	NO
Block 4_Second - 798_S_03_Room 1	NO (-31.5%)	NO
Block 4_Second - 798_S_02_Room 3	NO (-48.3%)	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]	243.6	243.6
External area [m ²]	433.8	433.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	25	5
Average conductance [W/K]	663.02	190.8
Average U-value [W/m ² K]	1.53	0.44
Alpha value* [%]	6.08	20.78

* 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	81.71	26.86
Cooling	6.34	6.62
Auxiliary	5.32	0.68
Lighting	19.48	19.6
Hot water	0.47	7.55
Equipment*	39.16	39.16
TOTAL **	113.33	61.3

* 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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	595.5	185.43
Primary energy* [kWh/m ²]	218.75	122.21
Total emissions [kg/m ²]	37.7	21.3

* 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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] No Heating or Cooling										
	Actual	345.8	0	0	0	0	0	0	0	0
	Notional	71.5	0	0	0	0	0	----	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Natural Gas										
	Actual	696.3	48.1	225.7	0	3.7	0.86	0	0.96	0
	Notional	92.2	62.5	31.3	0	1.7	0.82	0	----	----
[ST] Other local room heater - fanned, [HS] Room heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	1139.4	93.6	395.6	0	13.2	0.8	0	1	0
	Notional	214.8	136.3	72.9	0	10.6	0.82	0	----	----
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	449.6	92.7	32.7	8.8	0	3.82	2.91	4.1	4.1
	Notional	74.9	119.7	25.4	9.2	0	0.82	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-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.2	Block 2_Ground - 798_G_04_Dis WC_W_7
Floor	0.2	0.29	Block 2_Ground - 798_G_02_Meeting Rm_S_3
Roof	0.15	2.13	Block 1_Basement - 798_B_01_Stair_R_5
Windows, roof windows, and rooflights	1.5	1.8	Block 3_First - 798_F_01_Stair_G_7
Personnel doors	1.5	2.82	Block 2_Ground - 798_G_01_Hall_D_13
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-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	25