

Project name

Endell Street - Be Green + 120m² PV

As designed

Date: Wed Mar 23 09:43:28 2022

Administrative information

Building Details

Address: 24 Endell Street, London, WC2H 9HQ

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.1

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

Certifier details

Name: Walter De Intinis

Telephone number: 0207 014 0418

Address: 99 Charterhouse Street, Farringdon, LONDON, EC1M 6HR

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	22.8
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	22.8
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	19.4
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	0.3	0.31	External Wall
Floor	0.25	0.25	0.25	Ground Floor
Roof	0.25	0.24	0.26	Roof
Windows***, roof windows, and rooflights	2.2	1.83	1.91	00 N Win 03a
Personnel doors	2.2	2.18	2.18	00 N Win 02 (Gate)
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project
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	10

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- VRF Cooling Office (65 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.9	5	-	1.6	0.75
Standard value	2.5*	2.6	N/A	1.6^	0.5
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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

2- VRF Cooling Office (B2_Production Machine Room 2)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.9	-	-	1.6	0.75
Standard value	2.5*	N/A	N/A	1.6^	0.5
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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

3- Toilet Extract Only (18 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	0.5	-
Standard value	0.86	N/A	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

4- Shower Mech Ventilation (3 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	1.8	0.75
Standard value	0.86	N/A	N/A	1.1^	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

5- Natural Ventilation Circulation

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	0.86	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

1- New HWS Circuit

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0
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
B2_Staff Room 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B2_Production Machine Room 2	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B2_Music Control Room 3	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B2_Shooting Stage 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
00_Changing 1	-	-	-	1.8	-	-	-	-	-	-	-	N/A
00_Changing 2	-	-	-	1.8	-	-	-	-	-	-	-	N/A
00_Changing 3	-	-	-	1.8	-	-	-	-	-	-	-	N/A
B1_Staff Room 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B1_Staff Room 2	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B1_Audio Control Room3	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B1_Production Control Room 4	-	-	-	1.6	-	-	-	-	-	-	-	N/A
B1_Equipment Room 5	-	-	-	1.6	-	-	-	-	-	-	-	N/A
00_Gallery 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
00_Studio 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
00_Studio 2	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 2	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 3	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 4	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 5	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 6	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 7	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 8	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 9	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 10	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 11	-	-	-	1.6	-	-	-	-	-	-	-	N/A
01_Office 12	-	-	-	1.6	-	-	-	-	-	-	-	N/A
02_Office 1	-	-	-	1.6	-	-	-	-	-	-	-	N/A
02_Office 3	-	-	-	1.6	-	-	-	-	-	-	-	N/A
02_Office 4	-	-	-	1.6	-	-	-	-	-	-	-	N/A
02_Office 5	-	-	-	1.6	-	-	-	-	-	-	-	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	
02_Office 6	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 7	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 8	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 9	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 11	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 12	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 13	-	-	-	1.6	-	-	-	-	-	-	N/A	
02_Office 14	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 1	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 2	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 3	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 4	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 5	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 6	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 7	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 8	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 9	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 10	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 11	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 12	-	-	-	1.6	-	-	-	-	-	-	N/A	
03_Office 13	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 1	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 2	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 3	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 4	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 5	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 6	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 7	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 8	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 9	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 10	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 11	-	-	-	1.6	-	-	-	-	-	-	N/A	
04_Office 12	-	-	-	1.6	-	-	-	-	-	-	N/A	
05_Office 1	-	-	-	1.6	-	-	-	-	-	-	N/A	
05_Office 2	-	-	-	1.6	-	-	-	-	-	-	N/A	
00_Reception 1	-	-	-	1.6	-	-	-	-	-	-	N/A	
00_Reception 2	-	-	-	1.6	-	-	-	-	-	-	N/A	
00_Reception 3	-	-	-	1.6	-	-	-	-	-	-	N/A	
B1_Toilet 1	-	-	0.5	-	-	-	-	-	-	-	N/A	
B1_Toilet 2	-	-	0.5	-	-	-	-	-	-	-	N/A	
B1_Toilet 3	-	-	0.5	-	-	-	-	-	-	-	N/A	
00_Toilet 1	-	-	0.5	-	-	-	-	-	-	-	N/A	
00_Toilet 2	-	-	0.5	-	-	-	-	-	-	-	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
01_Toilet 1	-	-	0.5	-	-	-	-	-	-	-	N/A
01_Toilet 2	-	-	0.5	-	-	-	-	-	-	-	N/A
02_Toilet 1	-	-	0.5	-	-	-	-	-	-	-	N/A
02_Toilet 2	-	-	0.5	-	-	-	-	-	-	-	N/A
02_Toilet 3	-	-	0.5	-	-	-	-	-	-	-	N/A
03_Toilet 11	-	-	0.5	-	-	-	-	-	-	-	N/A
03_Toilet 12	-	-	0.5	-	-	-	-	-	-	-	N/A
03_Toilet 13	-	-	0.5	-	-	-	-	-	-	-	N/A
04_Toilet 14	-	-	0.5	-	-	-	-	-	-	-	N/A
04_Toilet 15	-	-	0.5	-	-	-	-	-	-	-	N/A
04_Toilet 16	-	-	0.5	-	-	-	-	-	-	-	N/A
05_Toilet 17	-	-	0.5	-	-	-	-	-	-	-	N/A
05_Toilet 18	-	-	0.5	-	-	-	-	-	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B2_Staff Room 1		80	-	-	299
B2_Production Machine Room 2		80	-	-	648
B2_Music Control Room 3		80	-	-	442
B2_Shooting Stage 1		-	80	22	1239
00_Changing 1		-	80	-	115
00_Changing 2		-	80	-	28
00_Changing 3		-	80	-	20
B1_Staff Room 1		80	-	-	226
B1_Staff Room 2		80	-	-	377
B1_Audio Control Room3		80	-	-	285
B1_Production Control Room 4		80	-	-	758
B1_Equipment Room 5		80	-	-	319
00_Gallery 1		-	80	22	555
00_Studio 1		-	80	22	304
00_Studio 2		-	80	22	130
01_Office 1		100	-	-	291
01_Office 2		100	-	-	370
01_Office 3		100	-	-	288
01_Office 4		100	-	-	248
01_Office 5		100	-	-	533
01_Office 6		100	-	-	467
01_Office 7		100	-	-	528
01_Office 8		100	-	-	411
01_Office 9		100	-	-	278
01_Office 10		100	-	-	281
01_Office 11		100	-	-	282

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
01_Office 12		100	-	-	280
02_Office 1		100	-	-	692
02_Office 3		100	-	-	367
02_Office 4		100	-	-	288
02_Office 5		100	-	-	248
02_Office 6		100	-	-	533
02_Office 7		100	-	-	481
02_Office 8		100	-	-	528
02_Office 9		100	-	-	386
02_Office 11		100	-	-	278
02_Office 12		100	-	-	281
02_Office 13		100	-	-	283
02_Office 14		100	-	-	280
03_Office 1		100	-	-	303
03_Office 2		100	-	-	330
03_Office 3		100	-	-	308
03_Office 4		100	-	-	284
03_Office 5		100	-	-	276
03_Office 6		100	-	-	610
03_Office 7		100	-	-	559
03_Office 8		100	-	-	529
03_Office 9		100	-	-	388
03_Office 10		100	-	-	220
03_Office 11		100	-	-	281
03_Office 12		100	-	-	283
03_Office 13		100	-	-	218
04_Office 1		100	-	-	276
04_Office 2		100	-	-	191
04_Office 3		100	-	-	316
04_Office 4		100	-	-	247
04_Office 5		100	-	-	199
04_Office 6		100	-	-	131
04_Office 7		100	-	-	599
04_Office 8		100	-	-	533
04_Office 9		100	-	-	528
04_Office 10		100	-	-	307
04_Office 11		100	-	-	328
04_Office 12		100	-	-	327
05_Office 1		100	-	-	284
05_Office 2		100	-	-	408
B2_Plant 1		80	-	-	152
B2_Plant 2		80	-	-	83
B1_Plant 3		80	-	-	215

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B1_Plant 4		80	-	-	241
00_Reception 1		-	80	22	285
00_Reception 2		-	80	22	247
00_Reception 3		-	80	22	149
B1_Toilet 1		-	80	-	118
B1_Toilet 2		-	80	-	93
B1_Toilet 3		-	80	-	94
00_Toilet 1		-	80	-	57
00_Toilet 2		-	80	-	56
01_Toilet 1		-	80	-	83
01_Toilet 2		-	80	-	37
02_Toilet 1		-	80	-	83
02_Toilet 2		-	80	-	37
02_Toilet 3		-	80	-	50
03_Toilet 11		-	80	-	83
03_Toilet 12		-	80	-	37
03_Toilet 13		-	80	-	34
04_Toilet 14		-	80	-	92
04_Toilet 15		-	80	-	38
04_Toilet 16		-	80	-	47
05_Toilet 17		-	80	-	64
05_Toilet 18		-	80	-	35
B1_Store 1		80	-	-	19
B1_Circ 1		-	80	-	105
B1_Circ 2		-	80	-	110
B1_Circ 3		-	80	-	28
B1_Circ 4		-	80	-	46
B1_Circ 5		-	80	-	20
B1_Circ 6		-	80	-	128
B1_Circ 7		-	80	-	60
B1_Circ 8		-	80	-	78
B1_Circ 9		-	80	-	16
00_Circ 1		-	80	-	92
00_Circ 2		-	80	-	40
00_Circ 3		-	80	-	21
00_Circ 4		-	80	-	55
00_Circ 5		-	80	-	105
00_Circ 6		-	80	-	28
00_Circ 7		-	80	-	20
01_Circ 17		-	80	-	18
01_Circ 18		-	80	-	45
01_Circ 19		-	80	-	21
01_Circ 20		-	80	-	52

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
02_Circ 21		-	80	-	41
02_Circ 22		-	80	-	18
02_Circ 23		-	80	-	60
03_Circ 24		-	80	-	41
03_Circ 25		-	80	-	18
03_Circ 26		-	80	-	16
03_Circ 27		-	80	-	60
04_Circ 28		-	80	-	48
04_Circ 29		-	80	-	19
04_Circ 30		-	80	-	45
05_Circ 31		-	80	-	34
05_Circ 32		-	80	-	11
05_Circ 33		-	80	-	46
B2_Store 1		80	-	-	15
B2_Store 2		80	-	-	28
B2_Circ 1		-	80	-	107
B2_Circ 2		-	80	-	35
B2_Circ 3		-	80	-	30
B2_Circ 4		-	80	-	47
B2_Circ 5		-	80	-	22
B2_Circ 6		-	80	-	142
B2_Circ 7		-	80	-	17
B2_Circ 8		-	80	-	26
B2_Circ 9		-	80	-	113
B2_Circ 10		-	80	-	42
B2_Circ 11		-	80	-	119
00_Bike Store 1		80	-	-	72
00_Store 2		80	-	-	31
00_Store 3		80	-	-	10
00_Store 4		80	-	-	10
00_Store 5		80	-	-	6
00_Store 6		80	-	-	6
00_Service Yard 1		80	-	-	103
00_Service Yard 2		80	-	-	52
00_Service Yard 3		80	-	-	42

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?
B2_Staff Room 1	N/A	N/A
B2_Production Machine Room 2	N/A	N/A
B2_Music Control Room 3	N/A	N/A
B2_Shooting Stage 1	N/A	N/A
B1_Staff Room 1	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B1_Staff Room 2	N/A	N/A
B1_Audio Control Room3	N/A	N/A
B1_Production Control Room 4	N/A	N/A
B1_Equipment Room 5	N/A	N/A
00_Gallery 1	NO (-82%)	YES
00_Studio 1	YES (+25%)	YES
00_Studio 2	NO (-96%)	NO
01_Office 1	NO (-66%)	YES
01_Office 2	NO (-94%)	YES
01_Office 3	NO (-92%)	YES
01_Office 4	N/A	N/A
01_Office 5	N/A	N/A
01_Office 6	N/A	N/A
01_Office 7	NO (-99%)	NO
01_Office 8	NO (-99%)	NO
01_Office 9	NO (-49%)	YES
01_Office 10	YES (+5%)	YES
01_Office 11	YES (+5%)	YES
01_Office 12	NO (-59%)	YES
02_Office 1	NO (-52%)	YES
02_Office 3	NO (-76%)	YES
02_Office 4	NO (-71%)	YES
02_Office 5	NO (-92%)	YES
02_Office 6	N/A	N/A
02_Office 7	NO (-99%)	NO
02_Office 8	NO (-99%)	NO
02_Office 9	NO (-99%)	NO
02_Office 11	NO (-49%)	YES
02_Office 12	YES (+6%)	YES
02_Office 13	YES (+5%)	YES
02_Office 14	NO (-78%)	YES
03_Office 1	NO (-99%)	NO
03_Office 2	NO (-73%)	YES
03_Office 3	NO (-81%)	YES
03_Office 4	NO (-75%)	YES
03_Office 5	NO (-85%)	YES
03_Office 6	N/A	N/A
03_Office 7	NO (-99%)	NO
03_Office 8	NO (-99%)	NO
03_Office 9	NO (-99%)	NO
03_Office 10	NO (-21%)	YES
03_Office 11	YES (+6%)	YES
03_Office 12	YES (+6%)	YES
03_Office 13	NO (-39%)	YES
04_Office 1	NO (-88%)	YES
04_Office 2	NO (-85%)	YES
04_Office 3	NO (-83%)	YES
04_Office 4	NO (-79%)	YES
04_Office 5	NO (-93%)	YES

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
04_Office 6	N/A	N/A
04_Office 7	N/A	N/A
04_Office 8	NO (-97%)	NO
04_Office 9	NO (-97%)	NO
04_Office 10	NO (-21%)	YES
04_Office 11	YES (+13%)	YES
04_Office 12	NO (-9%)	YES
05_Office 1	NO (-98%)	NO
05_Office 2	NO (-22%)	YES
00_Reception 1	NO (-28%)	YES
00_Reception 2	YES (+34%)	YES
00_Reception 3	YES (+23%)	YES

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 [m ²]	5800	5800
External area [m ²]	4911	4911
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	10	3
Average conductance [W/K]	2134	2009
Average U-value [W/m ² K]	0.43	0.41
Alpha value* [%]	18.35	18.35

* 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
84	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
16	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	3.95	2.06
Cooling	3.28	9.34
Auxiliary	4.98	2.92
Lighting	18.24	22.76
Hot water	11.82	13.68
Equipment*	33.96	33.96
TOTAL **	42.27	50.76

* 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	3.79	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]	85.82	136.15
Primary energy* [kWh/m ²]	126.53	122.87
Total emissions [kg/m ²]	19.4	22.8

* 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] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	16.3	86.4	1.2	4.8	7.1	3.9	5	3.9	5	
Notional	4.9	177.5	0.6	13.7	4.1	2.43	3.6	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	46.1	0	12.8	0	2.4	1	0	1	0	
Notional	20.9	0	7.1	0	1.9	0.82	0	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	40	0	11.1	0	7.7	1	0	1	0	
Notional	2.3	0	0.8	0	6.1	0.82	0	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	67.2	0	18.7	0	0	1	0	1	0	
Notional	30	0	10.2	0	0	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-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.28	External Wall (New)
Floor	0.2	0.25	Ground Floor
Roof	0.15	0.18	Roof (New)
Windows, roof windows, and rooflights	1.5	1.8	04 S Win 01
Personnel doors	1.5	2.18	00 N Win 02 (Gate)
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project
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	10