BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

PROPOSED CARE HOME, WORTHING - P01 (PRELIMINARY)

As designed

Date: Fri Jul 08 15:37:31 2022

Administrative information

Building Details

Address: 106-108 WARREN ROAD, WORTHING, BN14 9QX

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.2"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.2

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

Certifier details

Name: Harniss Contracting Ltd

Telephone number: 01933656850

Address: 1 Weekley Wood Avenue, Kettering, NN14 1UQ

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	38.6
Target CO_2 emission rate (TER), kgCO_2/m^2.annum	38.6
Building CO_2 emission rate (BER), kgCO_2/m^2.annum	37.5
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	0.24	0.24	External Wall
Floor	0.25	0.15	0.15	Ground Floor
Roof	0.25	0.14	0.16	Roof Wall (0.160m)
Windows***, roof windows, and rooflights	2.2	1.45	1.52	D T4 - 1.810 x 2.100 x 0.100
Personnel doors	2.2	1.53	1.53	W T5 (2) - 0.618 x 1.027 x 0.100 (Solid)
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

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m^{2}K)]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m^{2}K)]
$U_{i\text{-}Calc}$ = 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	5

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- RAD HEATING / LOCAL EXTRACT (101 Zones)

	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- RAD HEATING / NAT VENT

	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.

3- RAD HEATING / MECH VENT (36 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.96	-	-	1.4	0.8
Standard value	0.91*	N/A	N/A	1.1^	0.5
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.

^ 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- RAD HEATING & VRF COOLING / MECH VENT (10 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.96	6	-	1.4	0.8
Standard value	0.91*	2.6	N/A	1.1^	0.5
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.

^ 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- KITCHEN - RAD HEATING / CANOPY EXTRACT (0-Kitchen 025)

	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.

6- VRF / LOCAL EXTRACT (4 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0	6	-	-	-
Standard value	N/A	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

7- VRF / NAT VENT (0-Comms 11)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0	-	-	-	-
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

1- HWS

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	0.96	0
Standard value	0.9*	N/A
* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.		

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
0-Ensuite 001	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 002	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 003	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 004	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 005	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 006	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 007	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 008	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 009	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 010	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 011	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 012	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 013	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 014	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Ensuite 015	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
1-Ensuite 016	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 017	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 018	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 019	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 020	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 021	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 022	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 023	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 024	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 025	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 026	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 027	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 028	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 029	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 030	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 031	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 032	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 033	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 034	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 035	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 036	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 037	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 038	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 039	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Ensuite 040	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 041	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 042	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 043	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 044	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 045	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 046	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 047	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 048	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 049	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 050	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 051	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 052	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 053	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 054	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 055	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 056	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 057	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 058	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
2-Ensuite 059	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 060	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 061	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 062	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 063	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 064	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 065	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 066	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Ensuite 067	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 068	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 069	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 070	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 071	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 072	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 073	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 074	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 075	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 076	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 077	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 078	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 079	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 080	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Ensuite 081	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Kitchen 025	-	-	-	-	-	-	-	-	1	-	N/A
0-Laundry 013	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Male Staff Change 017	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Female Staff Change 018	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Kitchen Change 016	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Staff Room 015	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Cinema 007	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Resident Corridor 034	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 145	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 131	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 113	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Care Office 033	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Private Dining 142	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Dry Store 026	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Maintenance Store 010	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Assisted Bath 033	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Cleaners Store 029	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Cleaners Store 225	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Sluice 030	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Sluice 222	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
0-Drugs Store 034	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Dis. WC 006	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Dis. WC 223	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Hair and Beauty 004	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 111	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 136	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Resident Corridor 213	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Resident Corridor 235	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Resident Corridor 224	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Care Office 115	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Care Office 226	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Care Office 306	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Visitor WC 108	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Resident Corridor 032	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Resident Corridor 009	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Resident Corridor 002	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Resident Corridor 039	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 121	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Resident Corridor 119	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Quiet Lounge 320	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Day Space 132	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Day Space 220	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Day Space 201	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Day Space 301	-	-	-	1.4	-	-	-	-	-	-	N/A
1-Assisted Bath 117	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Assisted Bath 207	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Assisted Bath 314	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Cleaners Store 143	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Cleaners Store 317	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Sluice 130	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Sluice 309	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Drugs Store 116	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Drugs Store 227	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Drugs Store 307	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Dis. WC 036	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Dis. WC 112	0.3	-	-	-	-	-	-	-	-	-	N/A
2-Dis. WC 228	0.3	-	-	-	-	-	-	-	-	-	N/A
3-Dis. WC 303	0.3	-	-	-	-	-	-	-	-	-	N/A
0-Day Space 001	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Chef Office 028	-	-	-	1.4	-	-	-	-	-	-	N/A
0-Cinema Lobby 003	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Ensuite 082	0.3	-	-	-	-	-	-	-	-	-	N/A
1-Reception/Entrance Cafe 103	-	-	-	1.4	-	-	-	-	-	-	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
2-Resident Corridor 209	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Resident Corridor 205	-	-	-	1.4	-	-	-	-	-	-	N/A
2-Resident Corridor 230	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Resident Corridor 311	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Resident Corridor 308	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Resident Corridor 304	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Resident Corridor 319	-	-	-	1.4	-	-	-	-	-	-	N/A
3-Resident Corridor 302	-	-	-	1.4	-	-	-	-	-	-	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	
0-Bedroom 001	-	100	-	51
0-Bedroom 002	-	100	-	52
0-Bedroom 003	-	100	-	59
0-Bedroom 004	-	100	-	59
0-Bedroom 005	-	100	-	55
0-Bedroom 006	-	100	-	63
0-Bedroom 007	-	100	-	56
0-Bedroom 008	-	100	-	57
0-Bedroom 009	-	100	-	52
0-Bedroom 010	-	100	-	52
0-Bedroom 011	-	100	-	52
0-Bedroom 012	-	100	-	57
0-Bedroom 013	-	100	-	56
0-Bedroom 014	-	100	-	55
0-Bedroom 015	-	100	-	103
1-Bedroom 016	-	100	-	52
1-Bedroom 017	-	100	-	56
1-Bedroom 018	-	100	-	56
1-Bedroom 019	-	100	-	54
1-Bedroom 020	-	100	-	52
1-Bedroom 022	-	100	-	52
1-Bedroom 023	-	100	-	52
1-Bedroom 024	-	100	-	52
1-Bedroom 025	-	100	-	57
1-Bedroom 026	-	100	-	57
1-Bedroom 027	-	100	-	54
1-Bedroom 028	-	100	-	57
1-Bedroom 029	-	100	-	57
1-Bedroom 030	-	100	-	53
1-Bedroom 031	-	100	-	51
1-Bedroom 032	-	100	-	50

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
1-Bedroom 033	-	100	-	60
1-Bedroom 034	-	100	-	56
1-Bedroom 035	-	100	-	57
1-Bedroom 036	-	100	-	52
1-Bedroom 037	-	100	-	51
1-Bedroom 038	-	100	-	52
1-Bedroom 039	-	100	-	56
1-Bedroom 040	-	100	-	56
2-Bedroom 041	-	100	-	56
2-Bedroom 042	-	100	-	57
2-Bedroom 043	-	100	-	52
2-Bedroom 044	-	100	-	53
2-Bedroom 045	-	100	-	57
2-Bedroom 046	-	100	-	56
2-Bedroom 047	-	100	-	54
2-Bedroom 048	-	100	-	52
2-Bedroom 049	-	100	-	52
2-Bedroom 050	-	100	-	52
2-Bedroom 051	-	100	-	52
2-Bedroom 052	-	100	-	52
2-Bedroom 053	-	100	-	57
2-Bedroom 054	-	100	-	57
2-Bedroom 055	-	100	-	53
2-Bedroom 056	-	100	-	57
2-Bedroom 057	-	100	-	73
2-Bedroom 058	-	100	-	57
2-Bedroom 059	-	100	-	88
2-Bedroom 060	-	100	-	59
2-Bedroom 061	-	100	-	54
2-Bedroom 062	-	100	-	75
2-Bedroom 063	-	100	-	63
2-Bedroom 064	-	100	-	59
2-Bedroom 065	-	100	-	67
2-Bedroom 066	-	100	-	68
2-Bedroom 067	-	100	-	67
3-Bedroom 069	-	100	-	55
3-Bedroom 070	-	100	-	55
3-Bedroom 071	-	100	-	67
3-Bedroom 072	-	100	-	55
3-Bedroom 074	-	100	-	71
3-Bedroom 075	-	100	-	62
3-Bedroom 076	-	100	-	57
3-Bedroom 077	-	100	-	73

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
3-Bedroom 079	-	100	-	72
3-Bedroom 080	-	100	-	59
3-Bedroom 081	-	100	-	66
0-Ensuite 001	-	100	-	19
0-Ensuite 002	-	100	-	19
0-Ensuite 003	-	100	-	19
0-Ensuite 004	-	100	-	19
0-Ensuite 005	-	100	-	19
0-Ensuite 006	-	100	-	21
0-Ensuite 007	-	100	-	19
0-Ensuite 008	-	100	-	19
0-Ensuite 009	-	100	-	19
0-Ensuite 010	-	100	-	19
0-Ensuite 011	-	100	-	19
0-Ensuite 012	-	100	-	19
0-Ensuite 013	-	100	-	19
0-Ensuite 014	-	100	-	19
0-Ensuite 015	-	100	-	19
1-Ensuite 016	-	100	-	19
1-Ensuite 017	-	100	-	19
1-Ensuite 018	-	100	-	19
1-Ensuite 019	-	100	-	19
1-Ensuite 020	-	100	-	19
1-Ensuite 021	-	100	-	19
1-Ensuite 022	-	100	-	19
1-Ensuite 023	-	100	-	19
1-Ensuite 024	-	100	-	19
1-Ensuite 025	-	100	-	19
1-Ensuite 026	-	100	-	19
1-Ensuite 027	-	100	-	19
1-Ensuite 028	-	100	-	19
1-Ensuite 029	-	100	-	19
1-Ensuite 030	-	100	-	19
1-Ensuite 031	-	100	-	19
1-Ensuite 032	-	100	-	19
1-Ensuite 033	-	100	-	20
1-Ensuite 034	-	100	-	19
1-Ensuite 035	-	100	-	19
1-Ensuite 036	-	100	-	19
1-Ensuite 037	-	100	-	19
1-Ensuite 038	-	100	-	19
1-Ensuite 039	-	100	-	19
1-Ensuite 040	-	100	-	19

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
2-Ensuite 041	-	100	-	19
2-Ensuite 042	-	100	-	19
2-Ensuite 043	-	100	-	19
2-Ensuite 044	-	100	-	19
2-Ensuite 045	-	100	-	19
2-Ensuite 046	-	100	-	19
2-Ensuite 047	-	100	-	19
2-Ensuite 048	-	100	-	19
2-Ensuite 049	-	100	-	19
2-Ensuite 050	-	100	-	19
2-Ensuite 051	-	100	-	19
2-Ensuite 052	-	100	-	19
2-Ensuite 053	-	100	-	19
2-Ensuite 054	-	100	-	19
2-Ensuite 055	-	100	-	19
2-Ensuite 056	-	100	-	19
2-Ensuite 057	-	100	-	20
2-Ensuite 058	-	100	-	20
2-Ensuite 059	-	100	-	19
2-Ensuite 060	-	100	-	19
2-Ensuite 061	-	100	-	19
2-Ensuite 062	-	100	-	21
2-Ensuite 063	-	100	-	19
2-Ensuite 064	-	100	-	19
2-Ensuite 065	-	100	-	20
2-Ensuite 066	-	100	-	20
2-Ensuite 067	-	100	-	19
3-Ensuite 068	-	100	-	21
3-Ensuite 069	-	100	-	20
3-Ensuite 070	-	100	-	21
3-Ensuite 071	-	100	-	19
3-Ensuite 072	-	100	-	21
3-Ensuite 073	-	100	-	21
3-Ensuite 074	-	100	-	19
3-Ensuite 075	-	100	-	19
3-Ensuite 076	-	100	-	20
3-Ensuite 077	-	100	-	21
3-Ensuite 078	-	100	-	20
3-Ensuite 079	-	100	-	21
3-Ensuite 080	-	100	-	19
3-Ensuite 081	-	100	-	20
0-Stair A 021	-	100	-	80
1-Stair A 124	-	100	-	87

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
1-Stair B 109	-	100	-	77
1-Stair C 140	-	100	-	86
2-Stair A 214	-	100	-	88
2-Stair B 204	-	100	-	72
2-Stair C 233	-	100	-	73
3-Stair A 312	-	100	-	64
3-Stair B 322	-	100	-	78
0-Stair B 038	-	100	-	92
0-Stair C 045	-	100	-	78
0-Kitchen 025	-	100	-	601
0-Plantroom 024	100	-	-	250
0-Laundry 013	-	100	-	406
0-Male Staff Change 017	-	100	-	69
0-Female Staff Change 018	-	100	-	81
0-Kitchen Change 016	-	100	-	28
0-Staff Room 015	-	100	-	81
0-Cinema 007	-	100	-	196
0-Staff Lobby 027	-	100	-	64
0-Staff Corridor 014	-	100	-	113
0-Staff Corridor 012	-	100	-	142
0-Staff Corridor 010	-	100	-	39
0-Resident Corridor 034	-	100	-	50
1-Resident Corridor 145	-	100	-	49
1-Resident Corridor 131	-	100	-	41
1-Resident Corridor 113	-	100	-	57
0-Comms 11	100	-	-	72
0-Cinema AV Cupboard 008	100	-	-	17
0-Care Office 033	100	-	-	146
1-Private Dining 142	-	100	-	128
0-Store 022	100	-	-	10
0-Store 020	100	-	-	22
1-Store 139	100	-	-	16
1-Store 141	100	-	-	10
2-Store 215	100	-	-	10
2-Store 216	100	-	-	16
2-Store 211	100	-	-	10
2-Store 210	100	-	-	17
2-Store 229	100	-	-	17
0-Store 037	100	-	-	24
0-Store 040	100	-	-	10
0-Store 041	100	-	-	10
0-Store 043	100	-	-	10
0-Store 044	100	-	-	22

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
0-Store 046	100	-	-	10
1-Store 123	100	-	-	10
1-Store 122	100	-	-	16
1-Store 118	100	-	-	10
1-Store 128	100	-	-	10
1-Store 135	100	-	-	10
1-Store 134	100	-	-	10
1-Store 138	100	-	-	10
0-Dry Store 026	100	-	-	24
0-Maintenance Store 010	100	-	-	60
0-Assisted Bath 033	-	100	-	124
0-Cleaners Store 029	100	-	-	21
2-Cleaners Store 225	100	-	-	21
0-Sluice 030	100	-	-	50
2-Sluice 222	100	-	-	50
0-Drugs Store 034	100	-	-	97
0-Dis. WC 006	-	100	-	45
2-Dis. WC 223	-	100	-	42
0-Hair and Beauty 004	-	100	-	245
1-Resident Corridor 111	-	100	-	136
1-Resident Corridor 136	-	100	-	156
2-Resident Corridor 213	-	100	-	138
2-Resident Corridor 235	-	100	-	156
2-Resident Corridor 224	-	100	-	53
1-Admin Office 104	100	-	-	188
1-Managers Office 105	100	-	-	109
1-Care Office 115	100	-	-	114
2-Care Office 226	100	-	-	142
3-Care Office 306	100	-	-	104
1-Visitor WC 108	-	100	-	38
0-Resident Corridor 032	-	100	-	42
0-Resident Corridor 009	-	100	-	57
0-Resident Corridor 002	-	100	-	149
0-Resident Corridor 039	-	100	-	182
1-Resident Corridor 121	-	100	-	138
1-Resident Corridor 119	-	100	-	155
3-Quiet Lounge 320	-	100	-	179
1-Entrance Lobby 101	-	100	-	49
1-Day Space 132	-	100	-	496
2-Day Space 220	-	100	-	238
2-Day Space 201	-	100	-	435
3-Day Space 301	-	100	-	381
3-Bedroom 068	-	100	-	55

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
3-Bedroom 078	-	100	-	64
1-Assisted Bath 117	-	100	-	124
2-Assisted Bath 207	-	100	-	106
3-Assisted Bath 314	-	100	-	129
1-Cleaners Store 143	100	-	-	20
3-Cleaners Store 317	100	-	-	21
1-Sluice 130	100	-	-	50
3-Sluice 309	100	-	-	44
1-Drugs Store 116	100	-	-	100
2-Drugs Store 227	100	-	-	101
3-Drugs Store 307	100	-	-	96
0-Dis. WC 036	-	100	-	39
1-Dis. WC 112	-	100	-	39
2-Dis. WC 228	-	100	-	38
3-Dis. WC 303	-	100	-	42
0-Day Space 001	-	100	-	357
0-Tank Room 023	100	-	-	121
0-Chef Office 028	100	-	-	36
0-Cinema Lobby 003	-	100	-	77
3-Bedroom 082	-	100	-	63
3-Ensuite 082	-	100	-	20
1-Reception/Entrance Cafe 103	-	100	-	423
2-Resident Corridor 209	-	100	-	56
2-Resident Corridor 205	-	100	-	178
2-Store 203	100	-	-	17
2-Resident Corridor 230	-	100	-	109
2-Store 231	100	-	-	9
3-Resident Corridor 311	-	100	-	107
3-Resident Corridor 308	-	100	-	136
3-Resident Corridor 304	-	100	-	56
3-Resident Corridor 319	-	100	-	33
3-Resident Corridor 302	-	100	-	103

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?
0-Bedroom 001	NO (-94%)	NO
0-Bedroom 002	NO (-90%)	NO
0-Bedroom 003	NO (-61%)	NO
0-Bedroom 004	NO (-62%)	NO
0-Bedroom 005	NO (-62%)	NO
0-Bedroom 006	NO (-71%)	NO
0-Bedroom 007	NO (-71%)	NO
0-Bedroom 008	NO (-71%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0-Bedroom 009	NO (-68%)	NO
0-Bedroom 010	NO (-70%)	NO
0-Bedroom 011	NO (-58%)	NO
0-Bedroom 012	NO (-61%)	NO
0-Bedroom 013	NO (-62%)	NO
0-Bedroom 014	NO (-83%)	NO
0-Bedroom 015	NO (-68%)	NO
1-Bedroom 016	NO (-80%)	NO
1-Bedroom 017	NO (-62%)	NO
1-Bedroom 018	NO (-61%)	NO
1-Bedroom 019	NO (-59%)	NO
1-Bedroom 020	NO (-58%)	NO
1-Bedroom 022	NO (-58%)	NO
1-Bedroom 023	NO (-80%)	NO
1-Bedroom 024	NO (-69%)	NO
1-Bedroom 025	NO (-71%)	NO
1-Bedroom 026	NO (-72%)	NO
1-Bedroom 027	NO (-70%)	NO
1-Bedroom 028	NO (-71%)	NO
1-Bedroom 029	NO (-72%)	NO
1-Bedroom 030	NO (-85%)	NO
1-Bedroom 031	NO (-86%)	NO
1-Bedroom 032	NO (-82%)	NO
1-Bedroom 033	NO (-78%)	NO
1-Bedroom 034	NO (-84%)	NO
1-Bedroom 035	NO (-84%)	NO
1-Bedroom 036	NO (-82%)	NO
1-Bedroom 037	NO (-80%)	NO
1-Bedroom 038	NO (-79%)	NO
1-Bedroom 039	NO (-78%)	NO
1-Bedroom 040	NO (-79%)	NO
2-Bedroom 041	NO (-83%)	NO
2-Bedroom 042	NO (-85%)	NO
2-Bedroom 043	NO (-70%)	NO
2-Bedroom 044	NO (-79%)	NO
2-Bedroom 045	NO (-78%)	NO
2-Bedroom 046	NO (-78%)	NO
2-Bedroom 047	NO (-80%)	NO
2-Bedroom 048	NO (-71%)	NO
2-Bedroom 049	NO (-79%)	NO
2-Bedroom 050	NO (-71%)	NO
2-Bedroom 051	NO (-90%)	NO
2-Bedroom 052	NO (-85%)	NO
2-Bedroom 053	NO (-86%)	NO
2-Bedroom 054	NO (-86%)	NO
2-Bedroom 055	NO (-85%)	NO
2-Bedroom 056	NO (-84%)	NO
2-Bedroom 057	NO (-87%)	NO
2-Bedroom 058	NO (-86%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
2-Bedroom 059	NO (-84%)	NO
2-Bedroom 060	NO (-81%)	NO
2-Bedroom 061	NO (-79%)	NO
2-Bedroom 062	NO (-92%)	NO
2-Bedroom 063	NO (-94%)	NO
2-Bedroom 064	NO (-92%)	NO
2-Bedroom 065	NO (-93%)	NO
2-Bedroom 066	NO (-92%)	NO
2-Bedroom 067	NO (-90%)	NO
3-Bedroom 069	NO (-88%)	NO
3-Bedroom 070	NO (-85%)	NO
3-Bedroom 071	NO (-92%)	NO
3-Bedroom 072	NO (-87%)	NO
3-Bedroom 074	NO (-92%)	NO
3-Bedroom 075	NO (-92%)	NO
3-Bedroom 076	NO (-91%)	NO
3-Bedroom 077	NO (-94%)	NO
3-Bedroom 079	NO (-94%)	NO
3-Bedroom 080	NO (-94%)	NO
3-Bedroom 081	NO (-91%)	NO
0-Laundry 013	N/A	N/A
0-Staff Room 015	N/A	N/A
0-Cinema 007	N/A	N/A
0-Care Office 033	N/A	N/A
1-Private Dining 142	NO (-83%)	NO
0-Drugs Store 034	N/A	N/A
0-Hair and Beauty 004	N/A	N/A
1-Admin Office 104	NO (-79%)	NO
1-Managers Office 105	NO (-71%)	NO
1-Care Office 115	N/A	N/A
2-Care Office 226	N/A	N/A
3-Care Office 306	N/A	N/A
3-Quiet Lounge 320	NO (-70%)	NO
1-Day Space 132	NO (-64%)	NO
2-Day Space 220	NO (-75%)	NO
2-Day Space 201	NO (-81%)	NO
3-Day Space 301	NO (-70%)	NO
3-Bedroom 068	NO (-87%)	NO
3-Bedroom 078	NO (-92%)	NO
1-Drugs Store 116	N/A	N/A
2-Drugs Store 227	N/A	N/A
3-Drugs Store 307	N/A	N/A
0-Day Space 001	NO (-75%)	NO
0-Chef Office 028	N/A	N/A
3-Bedroom 082	NO (-88%)	NO
1-Reception/Entrance Cafe 103	NO (-58%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
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]	4096	4096
External area [m^2]	5248	5248
Weather	SOU	SOU
Infiltration [m^3/hm^2@ 50Pa]	5	3
Average conductance [W/K]	1425	2448
Average U-value [W/m^2K]	0.27	0.47
Alpha value* [%]	13.41	13.41

* 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
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
100	**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	8.89	16.36
Cooling	3.07	4.55
Auxiliary	10.76	8.89
Lighting	20.05	13.7
Hot water	98.25	98.46
Equipment*	55.47	55.47
TOTAL**	**141.01**	**141.97**

* 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	6.33	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]	96.3	113
Primary energy* [kWh/m^2]	234.83	221.39
Total emissions [kg/m^2]	37.5	38.6

* 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] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	100.9	0	30.7	0	12.8	0.91	0	0.96	0
	Notional	148.6	0	50.4	0	14	0.82	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	34.4	0	10.5	0	3.1	0.91	0	0.96	0
	Notional	61.7	0	20.9	0	1.9	0.82	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	0.9	0	0.3	0	19.8	0.91	0	0.96	0
	Notional	13.6	0	4.6	0	18	0.82	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	0.1	369.7	0	17.1	19.9	0.91	6	0.96	6
	Notional	2.1	349.4	0.7	27	19	0.82	3.6	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	0.1	0	0	0	78.5	0.91	0	0.96	0
	Notional	0.2	0	0.1	0	32.1	0.82	0	----	----
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Electricity, [CFT] Electricity										
	Actual	0	467.1	0	21.6	1.7	0	6	0	6
	Notional	0	379.7	0	29.3	5.2	0	3.6	----	----
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Electricity, [CFT] Electricity										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	0	0	0	0	0	0	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	0.24	External Wall
Floor	0.2	0.15	Ground Floor
Roof	0.15	0.07	Roof (Flat)
Windows, roof windows, and rooflights	1.5	1.44	D T2 - 2.035 x 2.100 x 0.100
Personnel doors	1.5	1.53	W T5 (2) - 0.618 x 1.027 x 0.100 (Solid)
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

$U_{i\text{-}Typ}$ = 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
$m^3/(h.m^2)$ at 50 Pa	5	5