

## Project name

The Rose of York Development

As designed

Date: Fri Sep 03 09:11:55 2021

## Administrative information

## Building Details

**Address:** The Rose of York, Petersham Road, Richmond,  
TW10 6UP

## Certification tool

**Calculation engine:** SBEM

**Calculation engine version:** v5.6.b.0

**Interface to calculation engine:** DesignBuilder SBEM

**Interface to calculation engine version:** v6.1.8

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

## Certifier details

**Name:** Steve Williams

**Telephone number:** 01202 067043

**Address:** 30 Wentworth Close Bournemouth, Dorset, BH5  
2DZ

Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	84.6
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	84.6
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	69.6
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 <sub>a</sub> -Limit	U <sub>a</sub> -Calc	U <sub>i</sub> -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.29	0.48	"03. New - Bed 2-4 Block - z28-Bed 2_P_7"
Floor	0.25	0.19	0.5	"05. New - Bed 14-19 Block - z61-Circulation_F_4"
Roof	0.25	0.24	0.25	"05. New - Bed 14-19 Block - z48-Rear Lobby_R_5"
Windows***, roof windows, and rooflights	2.2	1.6	1.6	"03. New - Bed 2-4 Block - z28-Bed 2_G_13"
Personnel doors	2.2	2.2	2.2	"03. New - Bed 2-4 Block - z31-Ent. Hall_D_12"
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 <sub>a</sub> -Limit = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)]		U <sub>a</sub> -Calc = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)]		U <sub>i</sub> -Calc = Calculated maximum individual element U-values [W/(m <sup>2</sup> 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 <sup>3</sup> /(h.m <sup>2</sup> ) 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	YES
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- LTHW Wet Rad System @ 92%EER as per Spec

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	0.92	-	-	-	-
<b>Standard value</b>	0.91*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					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.					

2- Mitsubishi City Multi @4.5SCOP/5.5SEER

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	5.5	4.5	-	-	-
<b>Standard value</b>	2.5*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* 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- LTHW Boiler - Spec = 92% BEPA

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	0.92	-
<b>Standard value</b>	0.8	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	ID of system type	SFP [W/(l/s)]									HR efficiency	
		A	B	C	D	E	F	G	H	I	Zone	Standard
	<b>Standard value</b>	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
03. New - Bed 2-4 Block - z29-Male W	0.3	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z61-Circulation	-	-	-	0.3	-	-	-	-	-	-	0.75	0.5
03. New - Bed 2-4 Block - z28-Bed 2	-	-	-	0.3	-	-	-	-	-	-	0.75	0.5
03. New - Bed 2-4 Block - z27-Bed 3	-	-	-	0.3	-	-	-	-	-	-	0.75	0.5
03. New - Bed 2-4 Block - z26-Bed 4	-	-	-	0.3	-	-	-	-	-	-	0.75	0.5
03. New - Bed 2-4 Block - z25-B2 Shw	0.3	-	-	-	-	-	-	-	-	-	-	N/A
03. New - Bed 2-4 Block - z24-B3 Shw	0.3	-	-	-	-	-	-	-	-	-	-	N/A
03. New - Bed 2-4 Block - z23-B4 Shw	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	Zone	Standard
	<b>Standard value</b>	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
04. New - Bed 20-27 Block - z46-Bed	21	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z45-B21	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z38-Bed	22	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z37-B22	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z36-B23	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z39-Bed	23	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z40-Bed	24	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z35-B24	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z34-B25	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z41-Bed	25	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z42-Bed	26	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z33-B26	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z31-B27	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z43-Bed	27	-	-	0.3	-	-	-	-	-	-	0.75	0.5
04. New - Bed 20-27 Block - z44-B20	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
04. New - Bed 20-27 Block - z32-Bed	20	-	-	0.3	-	-	-	-	-	-	0.75	0.5
05. New - Bed 14-19 Block - z59a-Bed	19	-	-	0.3	-	-	-	-	-	-	0.75	0.5
05. New - Bed 14-19 Block - z57a-B19	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z58-B18	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z56a-Bed	18	-	-	0.3	-	-	-	-	-	-	0.75	0.5
05. New - Bed 14-19 Block - z55a-Bed	17	-	-	0.3	-	-	-	-	-	-	0.75	0.5
05. New - Bed 14-19 Block - z60-B17	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z50-B16	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z52-B14	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z54-Bed	14	-	-	0.3	-	-	-	-	-	-	0.75	0.5
05. New - Bed 14-19 Block - z53-Bed	15	-	-	0.3	-	-	-	-	-	-	0.75	0.5
05. New - Bed 14-19 Block - z51-B15	Shwr	-	-	-	-	-	-	-	-	-	-	N/A
05. New - Bed 14-19 Block - z47-Bed	16	-	-	0.3	-	-	-	-	-	-	0.75	0.5

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
<b>Standard value</b>	60	60	22	
03. New - Bed 2-4 Block - z30-WC Lobby	-	257	-	2
03. New - Bed 2-4 Block - z29-Male WC	-	257	-	4
05. New - Bed 14-19 Block - z48-Rear Lobby	-	131	-	33
05. New - Bed 14-19 Block - z61-Circulation	-	151	-	47
03. New - Bed 2-4 Block - z31-Ent. Hall	-	115	-	67
03. New - Bed 2-4 Block - z28-Bed 2	-	123	-	67
03. New - Bed 2-4 Block - z27-Bed 3	-	121	-	65
03. New - Bed 2-4 Block - z26-Bed 4	-	111	-	82
03. New - Bed 2-4 Block - z25-B2 Shwr	-	241	-	14
03. New - Bed 2-4 Block - z24-B3 Shwr	-	210	-	16
03. New - Bed 2-4 Block - z23-B4 Shwr	-	179	-	19

General lighting and display lighting	Luminous efficacy [lm/W]			General lighting [W]
	Zone name	Luminaire	Lamp	
<b>Standard value</b>	60	60	22	
04. New - Bed 20-27 Block - z46-Bed 21	-	111	-	73
04. New - Bed 20-27 Block - z45-B21 Shwr	-	178	-	17
04. New - Bed 20-27 Block - z38-Bed 22	-	101	-	65
04. New - Bed 20-27 Block - z37-B22 Shwr	-	184	-	16
04. New - Bed 20-27 Block - z36-B23 Shwr	-	184	-	16
04. New - Bed 20-27 Block - z39-Bed 23	-	101	-	65
04. New - Bed 20-27 Block - z40-Bed 24	-	103	-	64
04. New - Bed 20-27 Block - z35-B24 Shwr	-	183	-	16
04. New - Bed 20-27 Block - z34-B25 Shwr	-	184	-	16
04. New - Bed 20-27 Block - z41-Bed 25	-	114	-	64
04. New - Bed 20-27 Block - z42-Bed 26	-	113	-	65
04. New - Bed 20-27 Block - z33-B26 Shwr	-	185	-	16
04. New - Bed 20-27 Block - z31-B27 Shwr	-	183	-	16
04. New - Bed 20-27 Block - z43-Bed 27	-	115	-	62
04. New - Bed 20-27 Block - z44-B20 Shwr	-	199	-	16
04. New - Bed 20-27 Block - z32-Bed 20	-	96	-	69
05. New - Bed 14-19 Block - z59a-Bed 19	-	151	-	34
05. New - Bed 14-19 Block - z57a-B19 Shwr	-	195	-	15
05. New - Bed 14-19 Block - z58-B18 Shwr	-	194	-	15
05. New - Bed 14-19 Block - z56a-Bed 18	-	148	-	35
05. New - Bed 14-19 Block - z55a-Bed 17	-	148	-	35
05. New - Bed 14-19 Block - z60-B17 Shwr	-	193	-	15
05. New - Bed 14-19 Block - z50-B16 Shwr	-	168	-	19
05. New - Bed 14-19 Block - z49-Stairwell	-	116	-	53
05. New - Bed 14-19 Block - z52-B14 Shwr	-	206	-	13
05. New - Bed 14-19 Block - z54-Bed 14	-	123	-	52
05. New - Bed 14-19 Block - z53-Bed 15	-	123	-	52
05. New - Bed 14-19 Block - z51-B15 Shwr	-	213	-	13
05. New - Bed 14-19 Block - z47-Bed 16	-	106	-	75

**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?
03. New - Bed 2-4 Block - z31-Ent. Hall	N/A	N/A
03. New - Bed 2-4 Block - z28-Bed 2	NO (-69.7%)	YES
03. New - Bed 2-4 Block - z27-Bed 3	NO (-69.8%)	YES
03. New - Bed 2-4 Block - z26-Bed 4	NO (-87.8%)	YES
03. New - Bed 2-4 Block - z25-B2 Shwr	N/A	N/A
03. New - Bed 2-4 Block - z24-B3 Shwr	N/A	N/A
03. New - Bed 2-4 Block - z23-B4 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z46-Bed 21	NO (-76.5%)	YES
04. New - Bed 20-27 Block - z45-B21 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z38-Bed 22	NO (-63.6%)	YES
04. New - Bed 20-27 Block - z37-B22 Shwr	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
04. New - Bed 20-27 Block - z36-B23 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z39-Bed 23	NO (-63.6%)	YES
04. New - Bed 20-27 Block - z40-Bed 24	NO (-71.1%)	YES
04. New - Bed 20-27 Block - z35-B24 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z34-B25 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z41-Bed 25	NO (-61.8%)	YES
04. New - Bed 20-27 Block - z42-Bed 26	NO (-62.3%)	YES
04. New - Bed 20-27 Block - z33-B26 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z31-B27 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z43-Bed 27	NO (-78%)	YES
04. New - Bed 20-27 Block - z44-B20 Shwr	N/A	N/A
04. New - Bed 20-27 Block - z32-Bed 20	NO (-60%)	YES
05. New - Bed 14-19 Block - z59a-Bed 19	N/A	N/A
05. New - Bed 14-19 Block - z57a-B19 Shwr	N/A	N/A
05. New - Bed 14-19 Block - z58-B18 Shwr	N/A	N/A
05. New - Bed 14-19 Block - z56a-Bed 18	N/A	N/A
05. New - Bed 14-19 Block - z55a-Bed 17	N/A	N/A
05. New - Bed 14-19 Block - z60-B17 Shwr	N/A	N/A
05. New - Bed 14-19 Block - z50-B16 Shwr	N/A	N/A
05. New - Bed 14-19 Block - z49-Stairwell	NO (-85.9%)	YES
05. New - Bed 14-19 Block - z52-B14 Shwr	N/A	N/A
05. New - Bed 14-19 Block - z54-Bed 14	NO (-88.5%)	YES
05. New - Bed 14-19 Block - z53-Bed 15	NO (-88.5%)	YES
05. New - Bed 14-19 Block - z51-B15 Shwr	N/A	N/A
05. New - Bed 14-19 Block - z47-Bed 16	NO (-95.5%)	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 <sup>2</sup> ]	426.2	426.2
External area [m <sup>2</sup> ]	1080.8	1080.8
Weather	LON	LON
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	3
Average conductance [W/K]	355.96	441.03
Average U-value [W/m <sup>2</sup> K]	0.33	0.41
Alpha value* [%]	20.36	17.05

\* 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

### 100 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<sup>2</sup>]

	Actual	Notional
Heating	13.46	27.73
Cooling	1.07	5.26
Auxiliary	5.15	9.06
Lighting	7.17	8.03
Hot water	260.65	277.39
Equipment*	9.36	9.36
<b>TOTAL**</b>	<b>287.5</b>	<b>327.47</b>

\* 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<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

## Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	239.87	303.43
Primary energy* [kWh/m <sup>2</sup> ]	396.41	484.19
Total emissions [kg/m <sup>2</sup> ]	69.6	84.6

\* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

## HVAC Systems Performance

System Type	Heat dem MJ/m <sup>2</sup>	Cool dem MJ/m <sup>2</sup>	Heat con kWh/m <sup>2</sup>	Cool con kWh/m <sup>2</sup>	Aux con kWh/m <sup>2</sup>	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
<b>[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Natural Gas</b>									
<b>Actual</b>	96.4	60.5	31	0	4.9	0.86	0	0.92	0
<b>Notional</b>	121	108.7	41	0	6.2	0.82	0	----	----
<b>[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity</b>									
<b>Actual</b>	228.9	15.9	12.4	1.1	5.2	5.13	3.91	5.5	5.5
<b>Notional</b>	235.6	72.3	26.9	5.6	9.2	2.43	3.6	----	----

### Key to terms

Heat dem [MJ/m <sup>2</sup> ]	= Heating energy demand
Cool dem [MJ/m <sup>2</sup> ]	= Cooling energy demand
Heat con [kWh/m <sup>2</sup> ]	= Heating energy consumption
Cool con [kWh/m <sup>2</sup> ]	= Cooling energy consumption
Aux con [kWh/m <sup>2</sup> ]	= 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 <sub>i-Typ</sub>	U <sub>i-Min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.26	"03. New - Bed 2-4 Block - z30-WC Lobby_W_9"
Floor	0.2	0.1	"05. New - Bed 14-19 Block - z61-Circulation_F_3"
Roof	0.15	0.16	"03. New - Bed 2-4 Block - z30-WC Lobby_R_5"
Windows, roof windows, and rooflights	1.5	1.6	"03. New - Bed 2-4 Block - z28-Bed 2_G_13"
Personnel doors	1.5	2.2	"03. New - Bed 2-4 Block - z31-Ent. Hall_D_12"
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 <sub>i-Typ</sub> = Typical individual element U-values [W/(m <sup>2</sup> K)]		U <sub>i-Min</sub> = Minimum individual element U-values [W/(m <sup>2</sup> K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	5