83 Mayes Road,

London, N22

Energy Statement for Planning

Job No: 5829

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Contents

Document Prepared By:	Document Authorised By:
Jim Westover	Samuel Westover
Dated:	Dated:
03.09.24	03.09.24
Signed:	Signed:

1.0 Introduction

1.1 T16 Design has been appointed to produce this Energy Statement for the proposed redevelopment of the site of the Duke of Edinburgh Public House, 83 Mayes Road, N22.

1.2 The report assesses the predicted energy performance and carbon dioxide emissions of the proposed development in the context of local and London-wide policy requirements and best practice methods.

1.3 The methodology used to demonstrate the effects of the proposed energy efficiency measures is the 4-stage Energy Hierarchy expounded by the London Plan, Policy SI 2.

1.4 Emissions reductions are shown for the proposed scheme at each of these stages and the strategy underpinning them is detailed in the relevant sections of the report.

1.5 The overarching position within these policies is that major developments should achieve net zero carbon through the following three stages.

- 1.5.1 Residential development should achieve 10% and non-residential development achieve 15% reduction through energy efficiency.
- 1.5.2 Overall on site emissions should be reduced by at least 35%
- 1.5.3 There is a benchmark target of reducing overall emissions by at least 50%.
- 1.5.4 The remaining emissions should be offset in accordance with the Borough's established carbon offset fund.

2.0 Project Summary

2.1 The site is currently occupied by the Duke of Edinburgh public house, a building constructed over 3 storeys.

2.2 It sits at the corner of Mayes Road and Coburg Road in the Wood Green area of north London.

2.3 The proposal is for a rearward extension rising to a maximum height of 4 storeys, creating eight residential units, lettable rooms accommodation for the Public House and the retention of the pub at ground floor level.

1.1 All proposed units have been included in the energy calculations to allow for the best understanding of climate impact of the building.

1.2 The site location is shown below.

Site Location

3.0 Policy Requirements and Drivers

3.1 The relevant planning policy and guidance documents for this site, relating to energy are:

3.1.1 The London Plan (2021)

- Policy SI 2 – Minimizing greenhouse gas emissions – developments should achieve a minimum of 35% reduction in on site CO2 emissions.
- Policy SI 4 – Managing Heat risk.

Haringey Council Local Plan

- Local Plan Policy SP4. 'Working Towards a Low Carbon HA'.
- Local Plan Policy CC2.3 'Minimising Energy Use'.

3.2 SP4 of the Haringey Local Plan, 'Working Towards a Low carbon Haringey' states that developments are expected to achieve a 20% reduction in predicted carbon dioxide emissions thorough the use of on-site renewable generation.

3.3 SP4 also states that all new residential developments are expected to achieve a zero- carbon standard. All remaining emissions will therefore need to be offset

3.4 It is our understanding that Haringey Council is currently working on a new Local Plan, which is intended to come into force later in 2024.

3.5 In light of these policy requirements and through the developer and design team's commitment to reducing the impact of the development on the environment, this report sets out some of the measures that will be adopted to meet the policy targets

4.0 Cooling and Overheating

4.1 London Plan Policy SI 4 'Managing heat risk' states that major development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the following:

- 4.1.1 minimise internal heat generation through energy efficient design.
- 4.1.2 reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, green roofs and walls
- 4.1.3 manage the heat within the building through exposed internal thermal mass and high ceilings.
- 4.1.4 passive ventilation.
- 4.1.5 mechanical ventilation.
- 4.1.6 active cooling systems (ensuring they are the lowest carbon options).

4.2 The building has been designed to be energy efficient and this has been addressed elsewhere in this energy statement and demonstrated in the calculations.

4.3 Mechanical Ventilation with Heat Recovery (MVHR) has been proposed for both the commercial and residential elements of the development. Further details are shown in Section 7 of this report.

4.4 There is no active cooling proposed for either the commercial or residential elements of the development.

4.5 Domestic developments are required to complete the Good Homes Alliance (GHA) Early Stage Overheating Risk Tool. This can be found in Appendix A of the report.

5.0 Energy Strategy and Approach

5.1 The London Plan Energy Statement Guidance (June 2022) sets out the necessary parameters that this energy strategy should adopt.

5.2 The four stages of the hierarchy are referred to as Be Lean (Use Less Energy), Be Clean (Supply Energy Efficiently), Be Green (Use Renewable Energy) and Be Seen (Monitor, verify and report on energy performance).

5.3 The Be Lean stage of the hierarchy requires that developments must reduce the energy demand of the building through architectural and building fabric measures (passive design) and energy efficient services (active design).

5.4 The second part of the Hierarchy (Be Clean), is interested in the how their energy systems will exploit local energy resources and supply energy efficiently and cleanly to reduce CO_2.

5.5 The third stage is the addition, where feasible to introduce renewable technology, which includes Heat pumps (Air and Ground), PV panel, Solar Hot Water panels and Wind Power.

5.6 The first stage of this process is to establish the baseline emissions on which the reductions will be based.

5.7 This is done using SAP (Standard Assessment Procedure) for the residential elements and SbEM (Simplified Building Energy Model) for the non-residential elements.

6.0 Baseline Emissions

6.1 The baseline emissions on which reduction figures are based are calculated using SAP/SbEM for the residential and non-residential elements respectively.

6.2 SAP and SbEM both calculate a notional building using the baseline Building Regulations parameters and represents the minimum allowable standard for the energy performance of the building to meet Part L.

6.3 The notional residential dwellings are based upon a gas boiler with an efficiency rating of 89.5% as shown in the table below.

6.4 The parameters used are defined by the methodology and represent a target upon which improvements can be measured.

6.5 The GLA emissions reporting tool provides the baseline emissions.

6.6 The baseline emissions for each element are provided below

Domestic Baseline Emissions	
	SAP 10 (Tonnes CO_2/Year)
Regulated	6.8 Tonnes CO_2

Table 1 – Residential Baseline Emissions

Non -Domestic Baseline Emissions	
	SAP 10 (Tonnes CO_2/Year)
Regulated	8.2 Tonnes CO_2

Table 2– Non-residential Baseline Emissions

Site-Wide Baseline Emissions	
	SAP 10 (Tonnes CO_2/Year)
Regulated	15.0 Tonnes CO_2

Table 3 – Site-Wide Baseline Emissions

6.0 Be Lean Strategy

7.1 The next stage, once the baseline has been established, is to make improvements within the "Be Lean" category. This includes improving the U Values, improving the thermal bridging at cold junction, and reducing air permeability.

7.2 Gas combi boilers with an 89.5% efficiency for the residential element have been assumed at this stage to match the notional dwelling specification (Table 5).

7.3 This allows the report to show the reduction in CO2 emissions from the energy efficient measures shown below.

7.4 In addition to this the residential elements will be serviced by a Mechanical Ventilation with Heat Recovery which will have a Heat Exchanger Efficiency of 89% and Specific Fan Power of between 0.47.

7.5 The lettable rooms part of the commercial element will also have an MVHR system. This will have a Heat Exchanger efficiency of 80% and a specific fan power of 0.6.

7.6 Waste Water with Heat Recovery (WWHR) has been proposed for both the residential and the lettable rooms part of the commercial element. For the residential element this will have an efficiency of 47%. For the lettable rooms, the efficiency figure will be 70%.

7.7 Electrical lighting also represents a significant energy use within a building. 100% low energy lighting is proposed to reduce emissions. The proposed lighting for the non-residential element will have an efficacy of 130 lumens per circuit watt. In addition, this will have auto on-off occupancy sensing, with a parasitic power figure of 0.05. A figure of 120 lumens per circuit watt is assumed for the residential.

7.8 Improved thermal bridging is proposed. It is currently assumed that the Y-value will be no greater than 0.03. The PSI values for the relevant junctions will be confirmed at the detailed design stage.

7.9 At this stage the non-residential element will have an Air Source Heat Pump with an efficiency of 264% for heating and 286% for hot water in accordance with the GLA Energy Assessment Guidance.

7.0 Be Lean Strategy

7.10 The proposed U-values, with the relevant Part L backstop are shown below.

Be Lean Specification			
Element or system	Notional Value	Proposed Value	% Improvement
External walls	U = 0.18 W/(m²k)	U = 0.15 W/(m²k)	16.70%
Floors	U = 0.13 W/(m²k)	U = 0.11 W/(m²k)	15.4%
Roof	U = 0.11 W/(m²k)	U = 0.10 W/(m²k)	9.1%
Windows and glazed doors	U = 1.2 W/(m²k)	U = 1..2 W/(m²k) with g-value of 0.63	0.00%
Air Permeability	5 m³/(hm²) at 50 Pa	3 m³/(hm²) at 50 Pa	40.00%
Lighting	Efficacy of all fixed lighting = 80 lm/W	Efficacy of all fixed lighting = 120 lm/W	50.00%

Table 4 – Be Lean Fabric Specification

Element	Value Used (Commercial)
External Walls	0.18 W/m²K
Existing External Walls	0.22 W/m²K
Ground Floor	0.12 W/m²k
Basement Floor	0.25 W/m²k
Separating Walls to unheated spaces	0.26 W/m²k
Openings	1.20 W/m²K (g-value =0.7)
Air Permeability	8

Table 5 – Non-residential Passive Design U-values

7.10 Following the implementation of these passive design measures including the building services the reduction in emissions at the Be Lean stage have been calculated as shown below.

7.11 As can be seen from the results on the following page, the residential element achieves more than a 10% reduction in regulated emissions, and the non-residential element achieves more than a 15% reduction in regulated emissions, thus complying with the London Plan hierarchy.

7.0 Be Lean Strategy

Domestic - Be Lean Emissions			
	Baseline Emissions	Be Lean Emissions	% Reduction
Regulated Emissions	6.8	5.9	13.%

Table 6 – Domestic - Be Lean Emissions

Commercial - Be Lean Emissions			
	Baseline Emissions	Be Lean Emissions	% Reduction
Regulated Emissions	8.2	6.4	22%

Table 7 – Non-residential - Be Lean Emissions

Sitewide - Be Lean Emissions			
	Baseline Emissions	Be Lean Emissions	% Reduction
Regulated	15	12.3	18%

Table 8 – Site Wide - Be Lean Emissions

8.0 Be Clean Strategy

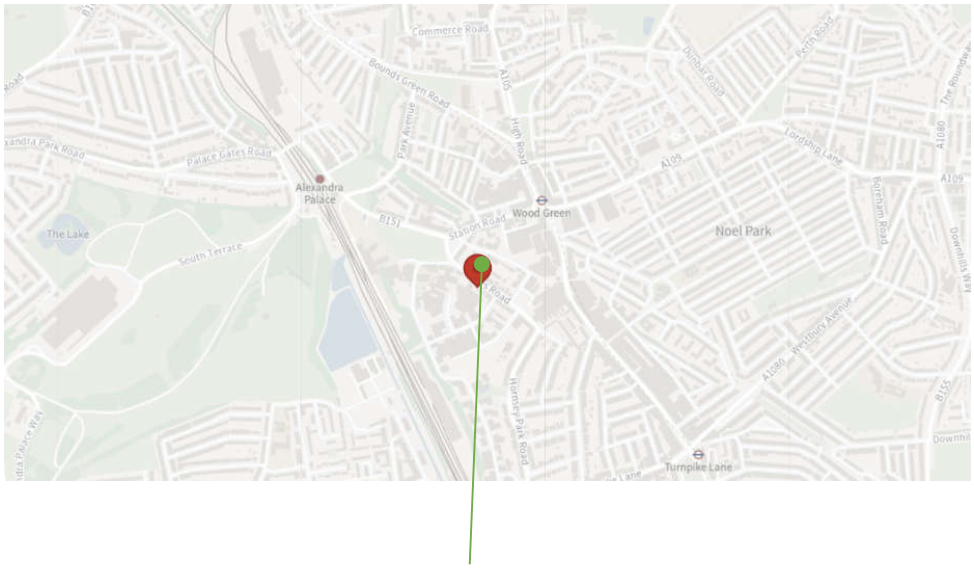
8.1 The Be Clean element of the hierarchy refers to supplying energy in a clean manner. This encompasses the use of energy efficient heating sources (such as heat pumps), decentralised energy and heat networks and the consideration of Combined Heat and Power.

8.2 The site does not sit within 800m of any existing decentralized energy or heating networks (as shown on the map below)

8.3 The site is also not located near any proposed heat networks

8.4 Due to the relatively small scale of the proposal, CHP is not a viable solution. London Plan guidance suggests that CHP is most suitable for developments of at least 500 units.

8.5 As there are currently no existing opportunities to connect to a heat network, and CHP is not suitable here, no changes have been made at the Be Clean stage.



Site Location

9.0 Be Green Strategy

9.1 The Be Green element of the hierarchy requires the consideration of renewable technologies to reduce emissions still further beyond the savings made at the Be Lean and Be Clean stages.

9.2 The technologies that are considered here are wind power, solar panels (photovoltaic (PV) or Solar Thermal) and heat pump technologies.

9.3 Wind power is not suitable in a location such as this. Wind turbines tend to perform poorly in built-up areas.

9.4 Any wind that is received on the site would be too intermittent and turbulent to provide any meaningful reduction in emissions.

9.5 Ground Source Heat pumps are also unlikely to be a viable proposition due to the ground disturbance required in their installation.

9.6 Air Source Heat Pumps (ASHP) however are a suitable solution in this instance and provide substantial improvements in CO2 emissions when combined with a high-performing fabric such as proposed here.

9.7 It is proposed that a community ASHP with an efficiency of 450% will provide heating and hot water to both the residential and commercial elements.

9.8 Due to the proposed extensive green roofs at the development, it is considered that PV panels are not suitable here.

9.9 The reductions in emissions at the Be Green stage are shown on the following page.

9.0 Be Green Strategy

Residential – Be Green Emissions			
	Be Lean Emissions	Be Green Emissions	% Reduction
Regulated	5.9	1.3	68%

Table 9– Domestic - Be Green Emissions

Commercial – Be Green Emissions			
	Be Lean Emissions	Be Green Emissions	% Reduction
Regulated	6.4	4.8	19%

Table 10 – Non-Residential - Be Green Emissions

Sitewide – Be Green Emissions			
	Be Lean Emissions	Be Green Emissions	% Reduction
Regulated	12.3	6.1	42%

Table 11– Site Wide - Be Green Emissions

10.0 Summary of Results

10.1 The tables below give the percentage improvement in emissions at each stage of the hierarchy and the overall savings made over Part L of the Building Regulations.

10.2 Both residential and commercial elements of the building will be provided with increased U values (as shown above), and a communal ASHP.

10.3 The figures below have been calculated using the GLA carbon emission reporting tool and show the total CO2 emissions expected.

83 Mayes Road- Residential	CO_2 Emissions (Tonnes)	% Reduction
Baseline (Part L 2022)	6.8	
After energy demand reduction	5.9	13.00%
After heat network / CHP	5.9	0.00%
After renewable energy	1.3	68.00%
Total Savings	5.5	81.00%

Table 12 – Residential Carbon emissions savings at each stage of the Energy Hierarchy

83 Mayes Road – Non-Residential	CO_2 Emissions (Tonnes)	% Reduction
Baseline (Part L 2022)	8.2	
After energy demand reduction	6.4	22.00%
After heat network / CHP	6.4	0.00%
After renewable energy	4.8	19.0%
Total Savings	3.4	42.0%

Table 13 – Non-Residential Carbon emissions savings at each stage of the Energy Hierarchy

10.0 Summary of Results

Total CO_2 Emissions each stage	Regulated	% Reduction
Baseline (Part L 2022)	15.0	-
After energy demand reduction	12.3	18%
After heat network / CHP	12.3	0%
After renewable energy	6.1	42%

Table 14 – Site wide Carbon Emissions (Tonnes)

EUI & Space Heating Demand				
	EUI Target (kWh/m²/year)	EUI (kWh/m²/year)	Space Heating Demand Target (kWh/m²/year)	Space Heating Demand (kWh/m²/year)
Residential	35	29.18	15	9.38
Commercial	55	47.48	15	6.98

Table 15 – EUI & Space Heating Demand

11.0 Conclusions

11.1 This energy statement has been produced to accompany an application for the redevelopment of the site at 83 Mayes Road, N22, to show how the site will meet the policy requirement of achieving 35% reduction in emissions through the Be Lean, Be Clean, Be Green hierarchy.

11.2 In doing so, preliminary SbEM and SAP calculations have been undertaken using the information available and sensible assumptions on construction and M&E parameters.

11.3 The baseline figures have been calculated and improvements made to the fabric and plant proposed for the scheme.

11.4 The measures at Be Lean can be summarised as:

- Significant fabric improvements
- Good air tightness.
- MVHR
- WWHR
- Improved thermal bridging.

11.5 The measures proposed at Be Green can be summarised as follows.

- Communal ASHP with 450% efficiency

11.6 The results in Section 12 show that an overall reduction of 60% of regulated CO2 emissions is achieved. Using the GLA's carbon emission reporting spreadsheet. This greatly exceeds the target and provides room for changes should they be required through the detailed design process.

11.7 The total regulated emissions for the development are 6.1 tonnes.

11.8 The offset payment requires £95 per tonne over 30 years. Therefore, the total offset payment is (1.9 x 30 x 95) = **£17,385.**

T16 Design Ltd.

T: 01206 572452

E: info@t16design.com

W: www.t16design.com

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Appendix A – GHA Overheating Calculation

EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.

Good Homes Alliance

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING | **KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING**

Geographical and local context

#1 Where is the scheme in the UK?
See guidance for map

South east	4	4
Northern England, Scotland & NI	0	
Rest of England and Wales	2	

#2 Is the site likely to see an Urban Heat Island effect?
See guidance for details

Central London (see guidance)	3	3
Grtr London, Manchester, B'ham	2	
Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure?
Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context

1	0

Site characteristics

#3 Does the site have barriers to windows opening?
- Noise/Acoustic risks
- Poor air quality/smells e.g. near factory or car park or very busy road
- Security risks/crime
- Adjacent to heat rejection plant

Day - reasons to keep all windows closed	8	0
Day - barriers some of the time, or for some windows e.g. on quiet side	4	
Night - reasons to keep all windows closed	8	0
Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green?
Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme

1	0

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas?
Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels

1	0

Scheme characteristics and dwelling design

#4 Are the dwellings flats?
Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples

3	3

#5 Does the scheme have community heating?
i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures

3	3

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation?
Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance

1	1

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future?
Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans

>2.8m and fan installed	2	1
> 2.8m	1	

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings?
(as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space

>65%	12	4
>50%	7	
>35%	4	

#7 Are the dwellings single aspect?
Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation

Single-aspect	3	0
Dual aspect	0	

#13 Is there useful external shading?
Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per **#6**

	Full	Part	
>65%	6	3	1
>50%	4	2	
>35%	2	1	

#14 Do windows & openings support effective ventilation?
Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates			
	= Part F	+50%	+100%	3
Single-aspect	minimum required	3	4	
Dual aspect		2	3	

TOTAL SCORE 11 = Sum of contributing factors: 17 *minus* Sum of mitigating factors: 6

High 12 **Medium** 8 **Low**

score >12:
Incorporate design changes to reduce risk factors and increase mitigation factors
AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:
Seek design changes to reduce risk factors and/or increase mitigation factors
AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:
Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

Appendix B – BRUKLS/SAP Calculations

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Duke of Edinburgh Pub LEAN

As designed

Date: Thu Aug 29 10:00:13 2024

Administrative information

Building Details

Address: Duke of Edinburgh, 83 Mayes Road, London, N22 6UP

Certifier details

Name: Jim Westover

Telephone number: 07969220992

Address: 28 Florida Street, London, E2 6AL

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.d

BRUKL compliance module version: v6.1.d.0

Foundation area [m^2]: 50.76

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	7.58	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	7.4	
Target primary energy rate (TPER), $kWh/m^2.annum$	80.86	
Building primary energy rate (BPER), $kWh/m^2.annum$	79.48	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.21	0.26	SW
Floors	0.18	0.1	0.1	Floor
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	1.2	1.2	left front
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

* 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. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m^2K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	8

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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- Heat pump

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	2.64	-	-	-	-
Standard value	2.5*	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 all types >12 kW output, except absorption and gas engine heat pumps.					

1- from heat pump

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	2.86	-
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation system
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

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	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
open plan kitchen	0.8	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	**General luminaire**	**Display light source**	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Combined cellars/stores	130	-	-
Basement ancillary space	130	-	-
Combined circulation area	130	-	-
Pub plus entrance	130	130	1.154
open plan kitchen	130	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Pub plus entrance	NO (-52.7%)	NO

Regulation 25A: Consideration of high efficiency 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
Floor area [m^2]	548.8	548.8
External area [m^2]	1367	1367
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	8	3
Average conductance [W/K]	241.02	373.71
Average U-value [W/m^2K]	0.18	0.27
Alpha value* [%]	30.5	17.72

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
100	**Restaurants and Cafes/Drinking Establishments/Takeaways**
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	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	12.14	16.5
Cooling	0	0
Auxiliary	10.05	6.8
Lighting	12.64	11.9
Hot water	17.28	20.37
Equipment*	61.59	61.59
TOTAL**	**52.11**	**55.56**

* 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	1.33
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*1.33*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	314.21	384.2
Primary energy [kWh/m^2]	79.48	80.86
Total emissions [kg/m^2]	7.4	7.58

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] No Heating or Cooling										
	Actual	145.1	6.2	0	0	0	0	0	0	0
	Notional	135.6	9.2	0	0	0	0	0	----	----
[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	222.7	280.9	26.3	0	21.7	2.36	0	2.64	0
	Notional	339	323.4	35.7	0	10.8	2.64	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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Duke of Edinburgh Pub BE GREEN

As designed

Date: Thu Aug 29 09:53:15 2024

Administrative information

Building Details

Address: Duke of Edinburgh, 83 Mayes Road, London, N22 6UP

Certifier details

Name: Jim Westover

Telephone number: 07969220992

Address: 28 Florida Street, London, E2 6AL

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.d

BRUKL compliance module version: v6.1.d.0

Foundation area [m^2]: 50.76

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	7.58	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	5.76	
Target primary energy rate (TPER), $kWh/m^2.annum$	80.86	
Building primary energy rate (BPER), $kWh/m^2.annum$	62.09	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.21	0.26	SW
Floors	0.18	0.1	0.1	Floor
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	1.2	1.2	left front
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

* 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. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m^2K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	8

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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- Heat pump

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4.5	-	-	-	-
Standard value	2.5*	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 all types >12 kW output, except absorption and gas engine heat pumps.					

1- from heat pump

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	4.5	-
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

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	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
open plan kitchen	0.8	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	**General luminaire**	**Display light source**	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Combined cellars/stores	130	-	-
Basement ancillary space	130	-	-
Combined circulation area	130	-	-
Pub plus entrance	130	130	1.154
open plan kitchen	130	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Pub plus entrance	NO (-52.7%)	NO

Regulation 25A: Consideration of high efficiency 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
Floor area [m^2]	548.8	548.8
External area [m^2]	1367	1367
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	8	3
Average conductance [W/K]	241.02	373.71
Average U-value [W/m^2K]	0.18	0.27
Alpha value* [%]	30.5	17.72

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
100	**Restaurants and Cafes/Drinking Establishments/Takeaways**
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	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	7.13	16.5
Cooling	0	0
Auxiliary	10.05	6.8
Lighting	12.64	11.9
Hot water	10.98	20.37
Equipment*	61.59	61.59
TOTAL**	**40.79**	**55.56**

* 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	1.33
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*1.33*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	314.21	384.2
Primary energy [kWh/m^2]	62.09	80.86
Total emissions [kg/m^2]	5.76	7.58

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] No Heating or Cooling										
	Actual	145.1	6.2	0	0	0	0	0	0	0
	Notional	135.6	9.2	0	0	0	0	0	----	----
[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	222.7	280.9	15.4	0	21.7	4.01	0	4.5	0
	Notional	339	323.4	35.7	0	10.8	2.64	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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Duke of Edinburgh Lettable Rooms BE LEAN

As designed

Date: Mon Sep 02 17:56:29 2024

Administrative information

Building Details

Address: Duke of Edinburgh, 83 Mayes Road, London, N22 6UP

Certifier details

Name: Jim Westover

Telephone number: 07969220992

Address: 28 Florida Street, London, E2 6AL

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.d

BRUKL compliance module version: v6.1.d.0

Foundation area [m^2]: 48.8

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	16.61	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	9.46	
Target primary energy rate (TPER), $kWh/m^2.annum$	178.95	
Building primary energy rate (BPER), $kWh/m^2.annum$	101.65	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.2	0.22	SW.1
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.12	0.12	Ceiling
Windows** and roof windows	1.6	1.2	1.2	Bed one 1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

* 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. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m^2K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	8

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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- Heat pump

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	2.64	-	-	-	-
Standard value	2.5*	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 all types >12 kW output, except absorption and gas engine heat pumps.					

1- from heat pump

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	2.86	-
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

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	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Bed one plus ensuite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed one plus ensuite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed two and en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed two and en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed three and en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed three and en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 4 and en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 4 and en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5 en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5 en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
communal kitchen	0.7	-	-	-	-	-	-	-	-	-	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
communal kitchen.1	0.5	-	-	-	-	-	-	-	-	-	N/A
3rd floor bed and ensuite one	-	-	-	-	0.6	-	-	-	-	0.8	N/A
3F bed two plus en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
3F Room 3 plus ensuite	-	-	-	-	0.6	-	-	-	-	0.8	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Bed one plus ensuite	130	-	-
Bed one plus ensuite.1	130	-	-
Bed two and en suite	130	-	-
Bed two and en suite.1	130	-	-
Bed three and en suite	130	-	-
Bed three and en suite.1	130	-	-
Bed 4 and en suite	130	-	-
Bed 4 and en suite.1	130	-	-
Bed 5	130	-	-
Bed 5.1	130	-	-
Bed 5 en suite	130	-	-
Bed 5 en suite.1	130	-	-
communal kitchen	130	-	-
communal kitchen.1	130	-	-
Circulation area	130	-	-
Circulation area.1	130	-	-
3rd floor bed and ensuite one	130	-	-
3F bed two plus en suite	130	-	-
3F Room 3 plus ensuite	130	-	-
3F Circulation	130	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Bed one plus ensuite	NO (-43.1%)	NO
Bed one plus ensuite.1	NO (-43.1%)	NO
Bed two and en suite	NO (-31%)	NO
Bed two and en suite.1	NO (-31%)	NO
Bed three and en suite	YES (+12.3%)	NO
Bed three and en suite.1	YES (+12.3%)	NO
Bed 4 and en suite	NO (-72.9%)	NO
Bed 4 and en suite.1	NO (-72.9%)	NO
Bed 5	NO (-74.4%)	NO
Bed 5.1	NO (-74.4%)	NO
communal kitchen	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
communal kitchen.1	N/A	N/A
3rd floor bed and ensuite one	NO (-69.9%)	NO
3F bed two plus en suite	NO (-64.7%)	NO
3F Room 3 plus ensuite	N/A	N/A

Regulation 25A: Consideration of high efficiency 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
Floor area [m^2]	243.5	243.5
External area [m^2]	334.3	334.3
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	8	3
Average conductance [W/K]	104.08	196.64
Average U-value [W/m^2K]	0.31	0.59
Alpha value* [%]	30.43	23.05

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
92	**Hotels**
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
8	**Residential Spaces**
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	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	11.9	17.96
Cooling	0	0
Auxiliary	10.85	12.11
Lighting	4.59	5.67
Hot water	39.32	84.83
Equipment*	13.44	13.44
TOTAL**	**66.66**	**120.57**

* 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
Displaced electricity	*0*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	184.25	259.61
Primary energy [kWh/m^2]	101.65	178.95
Total emissions [kg/m^2]	9.46	16.61

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] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	100.9	83.3	11.9	0	10.9	2.36	0	2.64	0
	Notional	170.7	88.9	18	0	8	2.64	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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Duke of Edinburgh Lettable Rooms BE GREEN

As designed

Date: Mon Sep 02 17:32:27 2024

Administrative information

Building Details

Address: Duke of Edinburgh, 83 Mayes Road, London, N22 6UP

Certifier details

Name: Jim Westover

Telephone number: 07969220992

Address: 28 Florida Street, London, E2 6AL

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.d

BRUKL compliance module version: v6.1.d.0

Foundation area [m^2]: 48.8

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	16.61	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	6.7	
Target primary energy rate (TPER), kWh/m^2.annum	178.95	
Building primary energy rate (BPER), kWh/m^2.annum	72.21	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.2	0.22	SW.1
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.12	0.12	Ceiling
Windows** and roof windows	1.6	1.2	1.2	Bed one 1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

* 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. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m^2K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	8

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

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- Heat pump

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4.5	-	-	-	-
Standard value	2.5*	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 all types >12 kW output, except absorption and gas engine heat pumps.					

1- from heat pump

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	4.5	-
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

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	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Bed one plus ensuite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed one plus ensuite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed two and en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed two and en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed three and en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed three and en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 4 and en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 4 and en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5 en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
Bed 5 en suite.1	-	-	-	-	0.6	-	-	-	-	0.8	N/A
communal kitchen	0.7	-	-	-	-	-	-	-	-	-	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
communal kitchen.1	0.5	-	-	-	-	-	-	-	-	-	N/A
3rd floor bed and ensuite one	-	-	-	-	0.6	-	-	-	-	0.8	N/A
3F bed two plus en suite	-	-	-	-	0.6	-	-	-	-	0.8	N/A
3F Room 3 plus ensuite	-	-	-	-	0.6	-	-	-	-	0.8	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Bed one plus ensuite	130	-	-
Bed one plus ensuite.1	130	-	-
Bed two and en suite	130	-	-
Bed two and en suite.1	130	-	-
Bed three and en suite	130	-	-
Bed three and en suite.1	130	-	-
Bed 4 and en suite	130	-	-
Bed 4 and en suite.1	130	-	-
Bed 5	130	-	-
Bed 5.1	130	-	-
Bed 5 en suite	130	-	-
Bed 5 en suite.1	130	-	-
communal kitchen	130	-	-
communal kitchen.1	130	-	-
Circulation area	130	-	-
Circulation area.1	130	-	-
3rd floor bed and ensuite one	130	-	-
3F bed two plus en suite	130	-	-
3F Room 3 plus ensuite	130	-	-
3F Circulation	130	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Bed one plus ensuite	NO (-43.1%)	NO
Bed one plus ensuite.1	NO (-43.1%)	NO
Bed two and en suite	NO (-31%)	NO
Bed two and en suite.1	NO (-31%)	NO
Bed three and en suite	YES (+12.3%)	NO
Bed three and en suite.1	YES (+12.3%)	NO
Bed 4 and en suite	NO (-72.9%)	NO
Bed 4 and en suite.1	NO (-72.9%)	NO
Bed 5	NO (-74.4%)	NO
Bed 5.1	NO (-74.4%)	NO
communal kitchen	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
communal kitchen.1	N/A	N/A
3rd floor bed and ensuite one	NO (-69.9%)	NO
3F bed two plus en suite	NO (-64.7%)	NO
3F Room 3 plus ensuite	N/A	N/A

Regulation 25A: Consideration of high efficiency 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
Floor area [m^2]	243.5	243.5
External area [m^2]	334.3	334.3
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	8	3
Average conductance [W/K]	104.08	196.64
Average U-value [W/m^2K]	0.31	0.59
Alpha value* [%]	30.43	23.05

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

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
92	**Hotels**
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
8	**Residential Spaces**
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	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	6.98	17.96
Cooling	0	0
Auxiliary	10.85	12.11
Lighting	4.59	5.67
Hot water	24.99	84.83
Equipment*	13.44	13.44
TOTAL**	**47.42**	**120.57**

* 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
Displaced electricity	*0*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	184.25	259.61
Primary energy [kWh/m^2]	72.21	178.95
Total emissions [kg/m^2]	6.7	16.61

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] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	100.9	83.3	7	0	10.9	4.01	0	4.5	0
	Notional	170.7	88.9	18	0	8	2.64	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

Block Compliance

Block Reference	Be Lean	**Issued on Date**	09/12/2023
Block Name			
Calculation Type	New Build (As Designed)		
Assessor Details	Mr. Samuel Westover	**Assessor ID**	AX13-0001
Client			

Block Compliance Report - DER

Block Reference: Be Lean	**Block Name:**			
Property-Assessment Reference	**Floor area (m^2)**	**DER ($kgCO_2/m^2$)**	**TER ($kgCO_2/m^2$)**	**% DER/TER**
Flat 1 - Flat 1 - Be Lean	97.50	8.31	9.47	12.25 %
Flat 2 - Flat 2 - Be Lean	51.20	11.28	12.73	11.39 %
Flat 3 - Flat 3 - Be Lean	52.30	11.22	12.64	11.23 %
Flat 4 - Flat 4 - Be Lean	58.40	13.52	14.62	7.52 %
Totals:	259.40	44.33	49.46	
Average DER = 10.66 $kgCO_2/m^2$	**% DER/TER**	PASS		
Average TER = 11.91 $kgCO_2/m^2$	10.55 %			

Block Compliance Report - DFEE

Block Reference: Be Lean	**Block Name:**			
Property-Assessment Reference	**Floor area (m^2)**	**DFEE ($kWh/m^2/yr$)**	**TFEE ($kWh/m^2/yr$)**	**% DFEE/TFEE**
Flat 1 - Flat 1 - Be Lean	97.50	20.67	21.93	5.70 %
Flat 2 - Flat 2 - Be Lean	51.20	18.86	21.23	11.16 %
Flat 3 - Flat 3 - Be Lean	52.30	19.35	21.36	9.42 %
Flat 4 - Flat 4 - Be Lean	58.40	35.29	34.34	-2.76 %
Totals:	259.40	94.17	98.85	
Average DFEE = 23.34 $kgCO_2/m^2$	**% DFEE/TFEE**	PASS		
Average TFEE = 24.47 $kgCO_2/m^2$	4.62 %			

Block Compliance Report - DPER

Block Reference: Be Lean	**Block Name:**			
Property-Assessment Reference	**Floor area (m^2)**	**DPER ($kWh/m^2/yr$)**	**TPER ($kWh/m^2/yr$)**	**% DPER/TPER**
Flat 1 - Flat 1 - Be Lean	97.50	53.35	50.10	-6.49 %
Flat 2 - Flat 2 - Be Lean	51.20	73.94	68.18	-8.45 %

Block Compliance

Flat 3 - Flat 3 - Be Lean	52.30	73.40	67.72	-8.39 %
Flat 4 - Flat 4 - Be Lean	58.40	84.65	78.16	-8.30 %
Totals:	259.40	285.34	264.16	
Average DPER = 68.50 $kgCO_2/m^2$	**% DPER/TPER**	FAIL		
Average TPER = 63.54 $kgCO_2/m^2$	-7.81 %			

Block Compliance

Block Reference	Be Green	**Issued on Date**	09/12/2023
Block Name			
Calculation Type	New Build (As Designed)		
Assessor Details	Mr. Samuel Westover	**Assessor ID**	AX13-0001
Client			

Block Compliance Report - DER

Block Reference: Be Green	**Block Name:**			
Property-Assessment Reference	**Floor area (m^2)**	**DER ($kgCO_2/m^2$)**	**TER ($kgCO_2/m^2$)**	**% DER/TER**
Flat 1 - Flat 1 - Be Green	97.50	2.02	9.12	77.85 %
Flat 2 - Flat 2 - Be Green	51.20	2.24	12.22	81.67 %
Flat 3 - Flat 3 - Be Green	52.30	3.15	12.13	74.03 %
Flat 4 - Flat 4 - Be Green	58.40	3.96	14.07	71.86 %
Totals:	259.40	11.37	47.54	
Average DER = 2.73 $kgCO_2/m^2$	**% DER/TER**	PASS		
Average TER = 11.45 $kgCO_2/m^2$	76.18 %			

Block Compliance Report - DFEE

Block Reference: Be Green	**Block Name:**			
Property-Assessment Reference	**Floor area (m^2)**	**DFEE ($kWh/m^2/yr$)**	**TFEE ($kWh/m^2/yr$)**	**% DFEE/TFEE**
Flat 1 - Flat 1 - Be Green	97.50	20.67	21.93	5.70 %
Flat 2 - Flat 2 - Be Green	51.20	18.86	21.23	11.16 %
Flat 3 - Flat 3 - Be Green	52.30	19.35	21.36	9.42 %
Flat 4 - Flat 4 - Be Green	58.40	35.29	34.34	-2.76 %
Totals:	259.40	94.17	98.85	
Average DFEE = 23.34 $kgCO_2/m^2$	**% DFEE/TFEE**	PASS		
Average TFEE = 24.47 $kgCO_2/m^2$	4.62 %			

Block Compliance Report - DPER

Block Reference: Be Green	**Block Name:**			
Property-Assessment Reference	**Floor area (m^2)**	**DPER ($kWh/m^2/yr$)**	**TPER ($kWh/m^2/yr$)**	**% DPER/TPER**
Flat 1 - Flat 1 - Be Green	97.50	21.30	48.23	55.84 %
Flat 2 - Flat 2 - Be Green	51.20	23.70	65.45	63.79 %

Block Compliance

Flat 3 - Flat 3 - Be Green	52.30	33.47	64.95	48.47 %
Flat 4 - Flat 4 - Be Green	58.40	41.49	75.18	44.81 %
Totals:	259.40	119.96	253.81	
Average DPER = 28.77 $kgCO_2/m^2$	**% DPER/TPER**	PASS		
Average TPER = 61.07 $kgCO_2/m^2$	52.88 %			