BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Beaches Yard

As designed

Date: Tue Aug 23 15:42:53 2022

Administrative information

Building Details

Address:

Certifier details

Name: Neil Ingham

Telephone number:

Address: Holborn Tower, London,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.c.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.1.2

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

Foundation area [m^2]: 382.7

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	1.4	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	1.77	
Target primary energy rate (TPER), kWh/m^2.annum	14.78	
Building primary energy rate (BPER), kWh/m^2.annum	19.11	
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	0.25	Block 2 - Shower_P_5
Floors	0.18	0.16	0.25	Block 2 - Shower_F_3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	Block 3 - Shower_R_4
Windows** and roof windows	1.6	1.4	1.4	Block 4 - WC_G_5
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	3

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- Electric Rads

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	2.69	5.89	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- Heat pump cylinder

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	3.2	0.011
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

2- POU

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
Standard value	1	N/A

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**
Block 3 - Sower & WC Lobby	-	-	0.4	-	-	-	-	-	-	-	N/A
Block 2 - Shower	-	-	0.4	-	-	-	-	-	-	-	N/A
Block 2 - WC	-	-	0.4	-	-	-	-	-	-	-	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block 2 - Kitchen	-	-	0.4	-	-	-	-	-	-	-	N/A
Block 3 - Shower	-	-	0.4	-	-	-	-	-	-	-	N/A
Block 3 - WC	-	-	0.4	-	-	-	-	-	-	-	N/A
Block 4 - WC	-	-	0.4	-	-	-	-	-	-	-	N/A
Block 4 - Office	-	-	-	-	1.2	-	-	-	-	0.75	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
Block 1 - Store	110	-	-
Block 1 - Circulation	110	-	-
Block 1 - Car Park	140	-	-
Block 2 - Warehouse	140	-	-
Block 2 - Circulation	110	-	-
Block 2 - Circulation	110	-	-
Block 2 - Refuse	130	-	-
Block 2 - Loading Bay	140	-	-
Block 2 - Plant	130	-	-
Block 2 - Loading & Unloading	140	-	-
Block 2 - Circulation	110	-	-
Block 2 - Forklift Lift	110	-	-
Block 2 - Shower & WC Lobby	110	-	-
Block 3 - Circulation 1	110	-	-
Block 3 - Warehouse	140	-	-
Block 3 - Store	110	-	-
Block 3 - Circulation 2	110	-	-
Block 3 - Circulation 3	110	-	-
Block 3 - Sower & WC Lobby	110	-	-
Block 3 - Store	110	-	-
Block 3 - Circulation	110	-	-
Block 2 - Shower	110	-	-
Block 2 - WC	110	-	-
Block 2 - Kitchen	110	-	-
Block 3 - Shower	110	-	-
Block 3 - WC	110	-	-
Block 4 - WC	110	-	-
Block 4 - Office	120	-	-
Block 4 - Circulation	110	-	-

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?
Block 2 - Warehouse	NO (-65%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block 2 - Loading Bay	N/A	N/A
Block 2 - Loading & Unloading	N/A	N/A
Block 3 - Warehouse	NO (-79.9%)	NO
Block 4 - Office	YES (+55.1%)	NO
Block 4 - Circulation	NO (-83.1%)	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]	6498	6498
External area [m^2]	21436.6	21436.6
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	5240.14	5492.98
Average U-value [W/m^2K]	0.24	0.26
Alpha value* [%]	6.81	17.63

* 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
80	**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
20	**Others: Car Parks 24 hrs**
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	2.17	1.72
Cooling	0.53	0.44
Auxiliary	0.43	0.45
Lighting	5.9	6.88
Hot water	3.53	3.57
Equipment*	24.63	24.63
TOTAL**	**12.55**	**13.06**

* 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	3.12
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*3.12*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	141.47	199.8
Primary energy [kWh/m^2]	19.11	14.78
Total emissions [kg/m^2]	1.77	1.4

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	104.4	25	0	0	0	0	0	0	0
	Notional	127.5	62.9	0	0	0.1	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Room heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	465.3	84.9	161.5	0	10.3	0.8	0	1	0
	Notional	452.1	151.8	93.7	0	15.4	1.34	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	121.5	170.4	12.8	10.8	5.8	2.64	4.4	2.69	5.89
	Notional	158	142.6	16.6	9	2.6	2.64	4.4	----	----

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