

Project name

WCS (Refurb Notional)

As designed

Date: Thu Apr 27 11:24:15 2023

Administrative information**Building Details**

Address: Address 1, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.19

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.19

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

Foundation area [m²]: 258.8**The CO₂ 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	4.17
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	6.35
Target primary energy rate (TPER), kWh _{PE} /m ² annum	45.55
Building primary energy rate (BPER), kWh _{PE} /m ² annum	68.95
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.3	0.3	BS000000:Surf[3]
Floors	0.18	0.25	0.25	BS000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.18	0.18	BS000000:Surf[2]
Windows** and roof windows	1.6	1.4	1.4	GF000000:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors [^]	1.6	-	-	No personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

U_{a-Limit} = Limiting area-weighted average U-values [W/(m²K)]
U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]
U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]

* 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/m²K
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	25

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	>0.95

1- Notional System Heating and Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	5	0	2.6	0.7
Standard value	2.5*	N/A	N/A	2^	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.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Notional System Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	-	0.2	-	-
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- DHW

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

Zone name	General lighting and display lighting	General luminaire	Display light source	
	Standard value	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	95	80	80	0.3
BASEMENT RETAIL FLEXIBLE CLASS E	60	60	60	2.5
BASEMENT RETAIL FLEXIBLE CLASS E	60	60	60	2.5
BASEMENT RETAIL FLEXIBLE CLASS E	60	60	60	2.5
GF RESIDENTIAL CIRCULATION	60	-	-	-
GF RESIDENTIAL CIRCULATION	60	-	-	-
GF RESIDENTIAL CIRCULATION	60	-	-	-
GF RESIDENTIAL CIRCULATION	60	-	-	-
GF RETAIL FLEXIBLE CLASS E	60	60	60	2.5
GF RETAIL FLEXIBLE CLASS E	60	60	60	2.5
GF RETAIL FLEXIBLE CLASS E	60	60	60	2.5
GF RETAIL FLEXIBLE CLASS E	60	60	60	2.5
GF SHARED CYCLE STORE	60	-	-	-
GF RETAIL FLEXIBLE CLASS E	60	60	60	2.5

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?
BASEMENT RETAIL FLEXIBLE CLASS E	NO (-99.9%)	NO
BASEMENT RETAIL FLEXIBLE CLASS E	N/A	N/A
BASEMENT RETAIL FLEXIBLE CLASS E	N/A	N/A
GF RETAIL FLEXIBLE CLASS E	YES (+22.2%)	NO
GF RETAIL FLEXIBLE CLASS E	NO (-24.5%)	NO
GF RETAIL FLEXIBLE CLASS E	NO (-2%)	NO
GF RETAIL FLEXIBLE CLASS E	YES (+3.2%)	NO
GF RETAIL FLEXIBLE CLASS E	YES (+41.8%)	NO

Regulation 25A: Consideration of high efficiency 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
Floor area [m ²]	539.9	539.9
External area [m ²]	703.5	703.5
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	25	3
Average conductance [W/K]	255.21	193.05
Average U-value [W/m ² K]	0.36	0.27
Alpha value* [%]	25.84	10

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

Building Use

% Area	Building Type
91	Retail/Financial and Professional Services
	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
9	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/m²]

	Actual	Notional
Heating	5.94	1.55
Cooling	3.87	2.72
Auxiliary	10.81	7.28
Lighting	24.54	17.98
Hot water	1.47	1.4
Equipment*	18.76	18.76
TOTAL**	46.63	30.93

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	97.11	60.79
Primary energy [kWh _{PE} /m ²]	68.95	45.55
Total emissions [kg/m ²]	6.35	4.17

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	30.4	0	3.8	0	2.6	2.23	0	2.5	0
	Notional	20.5	0	2	0	1.5	2.78	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	58.3	50.5	6.5	4.5	12.2	2.51	3.14	2.5	5
	Notional	15.7	52.3	1.6	3.1	8.2	2.78	4.63	----	----
[ST] No Heating or Cooling										
	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