

Project name

As designed

Date: Thu Jan 19 14:25:06 2023

Administrative information

Building Details

Address:

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.4"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.4

BRUKL compliance check version: v6.1.b.0

Foundation area [m²]: 6096.79The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.4
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	2.8
Target primary energy rate (TPER), kWh/m ² annum	35.85
Building primary energy rate (BPER), kWh/m ² annum	29.56
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	0.12	0.12	External Wall
Floors	0.18	0.18	0.18	Ground Floor
Pitched roofs	0.16	-	-	No pitched roofs in project
Flat roofs	0.18	0.12	0.12	Roof
Windows** and roof windows	1.6	1.77	1.84	0.6*2.2
Rooflights***	2.2	2.23	2.23	Rooflight
Personnel doors^	1.6	1.85	1.85	Door solid
Vehicle access & similar large doors	1.3	1.31	1.32	Vehicle door mezzanine
High usage entrance doors	3	-	-	No high usage entrance doors in project

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average 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

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	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	3.83

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- Supply and extract (2 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	-	1.5	0.7
Standard value	2.5*	N/A	N/A	1.9^	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.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- Htg + NV

	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					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

3- ASHP (33 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	-	1.5	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					YES
* 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.					

4- ASHP (3 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	-	1.5	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					YES
* 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.					

1- New HWS Circuit

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.86	0
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
Block 1 Circ 1	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 2	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 3	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 4	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 5	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 6	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 7	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 8	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 9	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 10	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 11	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Circ 12	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Canteen 1	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 kitchen 1	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Reception 1	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 1	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 2	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 3	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 4	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 5	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 6	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 7	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 8	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 9	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 10	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 11	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 meeting room 12	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Store Room 1	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Store Room 2	-	-	-	-	-	-	-	0.3	-	-	-	N/A
Block 1 Store Room 3	-	-	-	-	-	-	-	0.3	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block 1 Store Room 4	-	-	-	-	-	-	-	0.3	-	-	N/A
Block 1 Office 1	-	-	-	-	-	-	-	0.3	-	-	N/A
Block 1 Office 2	-	-	-	-	-	-	-	0.3	-	-	N/A
Block 1 Office 3	-	-	-	-	-	-	-	0.3	-	-	N/A
Block 1 Office 4	-	-	-	-	-	-	-	0.3	-	-	N/A
Block 1 Office 5	-	-	-	-	-	-	-	0.3	-	-	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 Circ 1		-	-	-
Block 1 Circ 2		-	-	-
Block 1 Circ 3		-	-	-
Block 1 Circ 4		-	-	-
Block 1 Circ 5		-	-	-
Block 1 Circ 6		-	-	-
Block 1 Circ 7		-	-	-
Block 1 Circ 8		-	-	-
Block 1 Circ 9		-	-	-
Block 1 Circ 10		-	-	-
Block 1 Circ 11		-	-	-
Block 1 Circ 12		-	-	-
Block 1 Canteen 1		-	-	-
Block 1 kitchen 1		-	-	-
Block 1 WC 1		-	-	-
Block 1 WC 2		-	-	-
Block 1 Reception 1		-	95	-
Block 1 meeting room 1		140	-	-
Block 1 meeting room 2		140	-	-
Block 1 meeting room 3		140	-	-
Block 1 meeting room 4		140	-	-
Block 1 meeting room 5		140	-	-
Block 1 meeting room 6		140	-	-
Block 1 meeting room 7		140	-	-
Block 1 meeting room 8		140	-	-
Block 1 meeting room 9		140	-	-
Block 1 meeting room 10		140	-	-
Block 1 meeting room 11		140	-	-
Block 1 meeting room 12		140	-	-
Block 1 Store Room 1		140	-	-
Block 1 Store Room 2		140	-	-
Block 1 Store Room 3		140	-	-
Block 1 Store Room 4		140	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
Block 1 Office 1		140	-	-
Block 1 Office 2		140	-	-
Block 1 Office 3		140	-	-
Block 1 Office 4		140	-	-
Block 1 Office 5		140	-	-
Block 3 00 1		140	-	-
Block 3 00 2		140	-	-
Block 3 00 3		140	-	-
Block 3 00 4		140	-	-
Block 3 01 1		140	-	-
Block 3 01 2		140	-	-
Block 4 00 1		140	-	-
Block 4 00 2		140	-	-
Block 4 00 3		140	-	-
Block 4 00 4		140	-	-
Block 4 01 1		140	-	-
Block 4 01 2		140	-	-
Block 2 00 1		140	-	-
Block 2 00 2		140	-	-
Block 2 00 3		140	-	-
Block 2 00 4		140	-	-
Block 2 01 1		140	-	-
Block 2 01 2		140	-	-
Block 5 00 1		140	-	-
Block 5 00 2		140	-	-
Block 5 00 3		140	-	-

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 1 Circ 1	NO (-67%)	NO
Block 1 Circ 2	YES (+130%)	NO
Block 1 Circ 3	NO (-27%)	NO
Block 1 Circ 4	NO (-45%)	NO
Block 1 Circ 5	NO (-71%)	NO
Block 1 Circ 6	NO (-4%)	NO
Block 1 Circ 7	NO (-20%)	NO
Block 1 Circ 8	NO (-70%)	NO
Block 1 Circ 9	NO (-83%)	NO
Block 1 Circ 10	NO (-52%)	NO
Block 1 Circ 11	NO (-73%)	NO
Block 1 Circ 12	NO (-14%)	NO
Block 1 Canteen 1	NO (-56%)	NO
Block 1 kitchen 1	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block 1 Reception 1	YES (+80%)	NO
Block 1 meeting room 1	NO (-59%)	NO
Block 1 meeting room 2	NO (-58%)	NO
Block 1 meeting room 3	NO (-55%)	NO
Block 1 meeting room 4	NO (-90%)	NO
Block 1 meeting room 5	NO (-86%)	NO
Block 1 meeting room 6	NO (-84%)	NO
Block 1 meeting room 7	NO (-81%)	NO
Block 1 meeting room 8	NO (-83%)	NO
Block 1 meeting room 9	NO (-93%)	NO
Block 1 meeting room 10	NO (-93%)	NO
Block 1 meeting room 11	NO (-42%)	NO
Block 1 meeting room 12	NO (-41%)	NO
Block 1 Store Room 1	N/A	N/A
Block 1 Store Room 2	N/A	N/A
Block 1 Store Room 3	N/A	N/A
Block 1 Store Room 4	N/A	N/A
Block 1 Office 1	NO (-20%)	NO
Block 1 Office 2	YES (+18%)	NO
Block 1 Office 3	YES (+3%)	NO
Block 1 Office 4	NO (-61%)	NO
Block 1 Office 5	NO (-41%)	NO
Block 3 00 1	N/A	N/A
Block 3 00 2	NO (-98%)	NO
Block 3 00 3	NO (-76%)	NO
Block 3 00 4	NO (-57%)	NO
Block 3 01 1	YES (+12%)	NO
Block 3 01 2	NO (-14%)	NO
Block 4 00 1	N/A	N/A
Block 4 00 2	NO (-98%)	NO
Block 4 00 3	NO (-76%)	NO
Block 4 00 4	NO (-57%)	NO
Block 4 01 1	NO (-6%)	NO
Block 4 01 2	YES (+4%)	NO
Block 2 00 1	N/A	N/A
Block 2 00 2	NO (-98%)	NO
Block 2 00 3	NO (-75%)	NO
Block 2 00 4	NO (-56%)	NO
Block 2 01 1	NO (-12%)	NO
Block 2 01 2	YES (+10%)	NO
Block 5 00 1	NO (-35%)	NO
Block 5 00 2	NO (-46%)	NO
Block 5 00 3	NO (-34%)	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]	6097	6097
External area [m ²]	12148	12148
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	4	5
Average conductance [W/K]	3286	4148
Average U-value [W/m ² K]	0.27	0.34
Alpha value* [%]	19.57	4.57

* 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
24	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
76	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/m²]

	Actual	Notional
Heating	8.78	12.89
Cooling	1.32	1.55
Auxiliary	2.87	2.17
Lighting	4.31	5.24
Hot water	1.91	2
Equipment*	30.61	30.61
TOTAL **	19.19	23.86

* 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]	104.72	154.87
Primary energy [kWh/m ²]	29.56	35.85
Total emissions [kg/m ²]	2.8	3.4

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	10.6	0	1.2	0	8.2	2.51	0	2.64	0
	Notional	4.1	0	0.4	0	4.6	2.64	0	----	----
[ST] Multiburner radiant heaters, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	99.6	0	11	0	0	2.51	0	2.64	0
	Notional	166	0	17.5	0	0	2.64	0	----	----
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	32.9	94.7	3.7	6.2	12.9	2.51	4.27	2.64	4.5
	Notional	12.4	115.1	1.3	7.3	9.3	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