

Project name

Unit J1 Kingsway Business Park**As built****Date:** Thu Oct 10 15:40:30 2024

Administrative information

Building Details

Address: Unit J1, James Kearns Avenue, Kingsway
Business Park, Rochdale, OL16 4NZ

Certifier details

Name: Mohammed Fatade**Telephone number:** 0113 233 8028**Address:** BWB Consulting Limited, Whitehall Waterfront, 2
Riverside Way, Leeds, LS1 4EH

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.26**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.26**BRUKL compliance module version:** v6.1.e.1**Foundation area [m²]:** 14728.3The 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	2.65
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	1.89
Target primary energy rate (TPER), kWh _{PE} /m ² annum	26.86
Building primary energy rate (BPER), kWh _{PE} /m ² annum	18.53
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	0.25	0.25	00000002:Surf[1]
Floors	0.18	0.12	0.12	00000002:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.18	0.18	00000005:Surf[25]
Windows** and roof windows	1.6	1.2	1.2	00000000:Surf[1]
Rooflights***	2.2	1.3	1.3	00000005:Surf[26]
Personnel doors^	1.6	1.6	1.6	SP000001:Surf[1]
Vehicle access & similar large doors	1.3	1.27	1.3	00000005:Surf[11]
High usage entrance doors	3	-	-	No high usage entrance doors in building

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

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	1.63

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 to 0.95

1- 002_220810_ASHP (REYA16A-12A) VAM500

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.36	7.15	0	1.23	0.73
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- 004_Electric Panel Heater

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.67	-	-
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

3- 008_220810_Air Source Heat Pump (Shell)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	-	0	-	-
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

4- 001_220810_ASHP (REYA16A-12A) VAM350

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.36	7.15	0	0.99	0.77
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.					

5- 003_220810_ASHP (REYA16A-12A) VAM1500

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.36	7.15	0	1.14	0.77
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.					

6- 000_220810_ASHP (REYA16A-12A)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.36	7.15	0	-	-
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					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- 006_220810_Electric DHW (10L)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.063
Standard value	1	N/A

2- 009_220810_Instant Electric DHW (Shell)

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

3- 007_220810_Electric DHW (15L)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.047
Standard value	1	N/A

4- 005_220810_Electric DHW (5L)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.102
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		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
00_Plot J2_Unit J1_GF WC	-	-	0.7	-	-	-	-	-	-	-	-	N/A
01_Plot J2_Unit J1_FF Female WC	-	-	0.4	-	-	-	-	-	-	-	-	N/A
01_Plot J2_Unit J1_FF Male WC	-	-	0.4	-	-	-	-	-	-	-	-	N/A
01_Plot J2_Unit J1_FF Office (Tea)	-	-	0.7	-	-	-	-	-	-	-	-	N/A
01_Plot J2_Unit J1_FF WC	-	-	0.4	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting

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
00_Plot J2_Unit J1_GF Cleaners		142	-	-
00_Plot J2_Unit J1_GF Lift		95	-	-
00_Plot J2_Unit J1_GF Lobby		130	-	-

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
00_Plot J2_Unit J1_GF Riser		95	-	-
00_Plot J2_Unit J1_GF Stairs		133	-	-
00_Plot J2_Unit J1_GF Stairs		130	-	-
00_Plot J2_Unit J1_GF Warehouse		95	-	-
00_Plot J2_Unit J1_GF WC		113	-	-
01_Plot J2_Unit J1_FF Female WC		121	-	-
01_Plot J2_Unit J1_FF Lobby		124	-	-
01_Plot J2_Unit J1_FF Lobby		124	-	-
01_Plot J2_Unit J1_FF Male WC		121	-	-
01_Plot J2_Unit J1_FF Office		122	-	-
01_Plot J2_Unit J1_FF Office (Tea)		122	-	-
01_Plot J2_Unit J1_FF Riser		95	-	-
01_Plot J2_Unit J1_FF Riser		95	-	-
01_Plot J2_Unit J1_FF Stairs		133	-	-
01_Plot J2_Unit J1_FF Stairs		130	-	-
01_Plot J2_Unit J1_FF WC		113	-	-

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?
00_Plot J2_Unit J1_GF Lobby	YES (+64.6%)	NO
00_Plot J2_Unit J1_GF Stairs	N/A	N/A
00_Plot J2_Unit J1_GF Warehouse	YES (+47.7%)	NO
01_Plot J2_Unit J1_FF Lobby	NO (-99.9%)	NO
01_Plot J2_Unit J1_FF Lobby	NO (-2.4%)	NO
01_Plot J2_Unit J1_FF Office	NO (-69.2%)	NO
01_Plot J2_Unit J1_FF Office (Tea)	NO (-96.3%)	NO
01_Plot J2_Unit J1_FF Riser	YES (+0%)	NO
01_Plot J2_Unit J1_FF Riser	N/A	N/A
01_Plot J2_Unit J1_FF Stairs	NO (-100%)	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]	10856.3	10856.3
External area [m ²]	26572.8	26572.8
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	2	5
Average conductance [W/K]	5947.94	7340.54
Average U-value [W/m ² K]	0.22	0.28
Alpha value* [%]	25.08	10

* 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
8	General Industrial and Special Industrial Groups
92	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	8.84	12.81
Cooling	0.3	0.12
Auxiliary	0.52	0.89
Lighting	6.38	3.96
Hot water	4.22	3.95
Equipment*	30.9	30.9
TOTAL **	20.26	21.73

* 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	8.55	3.9
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>8.55</i>	<i>3.9</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	79.93	126.41
Primary energy [kWh _{PE} /m ²]	18.53	26.86
Total emissions [kg/m ²]	1.89	2.65

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] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	76.5	59	5.4	3.5	8	3.96	4.63	4.36	7.15	
Notional	63.3	12.4	6.3	0.7	21.3	2.78	4.63	----	----	
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	115.5	87.2	8	5.3	10	4	4.59	4.36	7.15	
Notional	93.4	16.3	9.3	1	23.2	2.78	4.63	----	----	
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	41.7	66	2.9	4	6.3	3.98	4.61	4.36	7.15	
Notional	47.7	30.6	4.8	1.8	9.1	2.78	4.63	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	320	0	111.1	0	1.7	0.8	0	1	0	
Notional	290.5	0	57.2	0	2.1	1.41	0	----	----	
[ST] Unflued forced-convection air heaters, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	74.3	0	8.3	0	0	2.5	0	2.5	0	
Notional	128.5	0	13	0	0	2.75	0	----	----	
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	278.2	170.9	19	9.4	27.8	4.06	5.08	4.36	7.15	
Notional	369.8	11.1	37	0.7	15.8	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