

Project name

Bishops Itchington Sports Pavilion

As designed

Date: Thu May 27 19:57:15 2021

Administrative information

Building Details

Address: Bishops Itchington Sports Pavilion, Chapel Street,
Bishops Itchington, Southam, , CV47 2RB

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.1"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.1

BRUKL compliance check version: v5.6.b.0

Certifier details

Name: John Littler

Telephone number: 01509 670100

Address: 28 Market Place, Kegworth, DE74 2EE

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	422
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	422
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	409.3
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	External Wall - Aluminium Clad
Floor	0.25	0.1	0.1	Ground Floor
Roof	0.25	0.16	0.18	Roof Flat
Windows***, roof windows, and rooflights	2.2	1.16	1.22	Window Adjacent Entrance Door
Personnel doors	2.2	2.2	2.2	Fire Escape
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* There might be more than one surface where the maximum U-value occurs.				
** 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.				
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	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	5*
* Buildings with less than 500 m ² total useful floor area may avoid the need for a pressure test provided that the air permeability is taken as 15 m ³ /(h.m ²) at 50 Pa.		

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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- LTHW Underfloor Heating With Mech Extract Ventilation (6 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.35	-	0.6	-	-
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. For types <=12 kW output, refer to EN 14825 for limiting standards.					

2- LTHW Radiator With Mech Extract Ventilation (2 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.35	-	0.6	-	-
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. For types <=12 kW output, refer to EN 14825 for limiting standards.					

3- LTHW Radiator With No Mech Ventilation

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.35	-	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. For types <=12 kW output, refer to EN 14825 for limiting standards.					

4- VRF Air Conditioning With Hybrid Natural Ventilation (Club Room)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.9	5.8	-	-	-
Standard value	0.91*	2.6	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 gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

5- LTHW Underfloor Heating With No Mech Ventilation

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.35	-	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. For types <=12 kW output, refer to EN 14825 for limiting standards.					

6- LTHW Underfloor Heating With MVHR (6 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.35	-	0.6	0.96	0.83
Standard value	2.5*	N/A	N/A	1.1^	0.5
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. For types <=12 kW output, refer to EN 14825 for limiting standards.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

1- New HWS Circuit

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	0.96	0
Standard value	N/A	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
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 supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

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	1.9	1.6	0.5	1.1	0.5	1			
Home Changing	-	-	-	-	1	-	-	-	-	-	N/A	
Away Changing	-	-	-	-	1	-	-	-	-	-	N/A	
Officials Shower / Changing 1	-	-	-	-	-	0.3	-	-	-	-	N/A	
Officials Shower / Changing 2	-	-	-	-	-	0.3	-	-	-	-	N/A	
Home Showers	-	-	-	-	1	-	-	-	-	-	N/A	
Away Showers	-	-	-	-	1	-	-	-	-	-	N/A	
Home WC	-	-	-	-	1	-	-	-	-	-	N/A	
Away WC	-	-	-	-	1	-	-	-	-	-	N/A	
Officials WC	-	-	-	-	-	0.3	-	-	-	-	N/A	
Disabled WC / Shower	-	-	-	-	-	0.3	-	-	-	-	N/A	
Unisex WC	-	-	-	-	-	0.3	-	-	-	-	N/A	
Disabled WC	-	-	-	-	-	0.3	-	-	-	-	N/A	
Kitchen	0.3	-	-	-	-	-	-	-	-	-	N/A	
Cleaners	0.3	-	-	-	-	-	-	-	-	-	N/A	

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
Home Changing	-	-	-	132
Away Changing	-	-	-	135
Officials Shower / Changing 1	-	-	-	25
Officials Shower / Changing 2	-	-	-	25
Circulation	-	-	-	74
Home Showers	-	-	-	68
Away Showers	-	-	-	71
Home WC	-	-	-	18
Away WC	-	-	-	18

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
Officials WC		-	-	-	16
Disabled WC / Shower		-	-	-	34
Unisex WC		-	-	-	83
Disabled WC		-	-	-	19
Store		-	-	-	9
Plant / Storage		-	-	-	31
Kitchen		-	-	-	57
Cleaners		-	-	-	17
Club Room		-	-	-	192

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Club Room	NO (-38%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of 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?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	217	217
External area [m ²]	711	711
Weather	BIR	BIR
Infiltration [m ³ /hm ² @ 50Pa]	5	5
Average conductance [W/K]	167	210
Average U-value [W/m ² K]	0.23	0.3
Alpha value* [%]	25.52	25.52

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

Building Use

% Area Building Type

A1/A2 Retail/Financial and Professional services	
A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways	
B1 Offices and Workshop businesses	
B2 to B7 General Industrial and Special Industrial Groups	
B8 Storage or Distribution	
C1 Hotels	
C2 Residential Institutions: Hospitals and Care Homes	
C2 Residential Institutions: Residential schools	
C2 Residential Institutions: Universities and colleges	
C2A Secure Residential Institutions	
Residential spaces	
D1 Non-residential Institutions: Community/Day Centre	
D1 Non-residential Institutions: Libraries, Museums, and Galleries	
D1 Non-residential Institutions: Education	
D1 Non-residential Institutions: Primary Health Care Building	
D1 Non-residential Institutions: Crown and County Courts	
100 D2 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	5.29	9.02
Cooling	1.24	1.12
Auxiliary	5.86	7.34
Lighting	19.58	17.26
Hot water	1869.61	1872.07
Equipment*	47.17	47.17
TOTAL**	1901.57	1906.81

* 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	21.36	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	86.98	98.32
Primary energy* [kWh/m ²]	2379.05	2387.92
Total emissions [kg/m ²]	409.3	422

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

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: floor heating, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	138.5	0	12.8	0	7.8	3.01	0	3.35	0
Notional	194.3	0	22.2	0	7.9	2.43	0	----	----
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	45.2	0	4.2	0	12.4	3.01	0	3.35	0
Notional	82.2	0	9.4	0	15.2	2.43	0	----	----
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	46	0	4.2	0	1.4	3.01	0	3.35	0
Notional	40.5	0	4.6	0	0.7	2.43	0	----	----
[ST] Fan coil systems, [HS] LTHW boiler, [HFT] Electricity, [CFT] Electricity									
Actual	98.8	82.1	7	4.4	4.8	3.9	5.22	3.9	5.8
Notional	63.7	53.8	7.3	4.2	2.4	2.43	3.6	----	----
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	141	0	13	0	3.5	3.01	0	3.35	0
Notional	42.1	0	4.8	0	2.1	2.43	0	----	----
[ST] Central heating using water: floor heating, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	1.8	0	0.2	0	9.4	3.01	0	3.35	0
Notional	24.9	0	2.9	0	13.9	2.43	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

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.2	External Wall
Floor	0.2	0.1	Ground Floor
Roof	0.15	0.14	Roof
Windows, roof windows, and rooflights	1.5	1.15	Roof Light - Club Room (2m x 2m)
Personnel doors	1.5	2.2	Fire Escape
Vehicle access & similar large doors	1.5	-	No vehicle doors in project
High usage entrance doors	1.5	-	No high usage entrance doors in project
U _{i-Typ} = Typical individual element U-values [W/(m ² K)]		U _{i-Min} = Minimum individual element U-values [W/(m ² K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m ³ /(h.m ²) at 50 Pa	5	5