

Project name

Winners Chapel

As designed

Date: Thu Oct 24 14:40:50 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 6.4.0.16

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 6.4.0.16

BRUKL compliance check version: v4.1.h.0

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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

1.1	CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	26.3
1.2	Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	26.3
1.3	Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	14.8
1.4	Are emissions from the building less than or equal to the target?	BER ≤ TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

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

2.a Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.13	0.13	RM00002F:Surf[6]
Floor	0.25	0.1	0.1	RM00002F:Surf[18]
Roof	0.25	0.15	0.15	RM000011:Surf[12]
Windows***, roof windows, and rooflights	2.2	1.22	1.4	RM00002F:Surf[0]
Personnel doors	2.2	1.6	1.6	RM00002E:Surf[0]
Vehicle access & similar large doors	1.5	-	-	No vehicle access doors in building
High usage entrance doors	3.5	-	-	No high usage entrance doors in building
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	3

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Radiator - NV

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
2.8	-	-	-
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

2- Radiator - Balanced MVHR

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
2.8	-	-	0.8
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

3- Radiator - Extract only

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
2.8	-	-	0.8
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

4- VAV - AHU 1 - radiator perimeter heating

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
3.19	5.5	2.12	0.75
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

5- VRF - MVHR

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
4.64	6.86	-	0.8
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

6- VAV - AHU 2 - radiator perimeter heating

Heating seasonal efficiency	Cooling nominal efficiency	SFP [W/(l/s)]	HR seasonal efficiency
3.19	5.5	1.83	0.75
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

1- Local DHW

Heating seasonal efficiency	Hot water storage loss factor [kWh/litre per day]
1	0.043

Local mechanical ventilation and exhaust

Zone	Supply/extract SFP [W/(l/s)]	HR seasonal efficiency	Exhaust SFP [W/(l/s)]
L00 - Acc WC 01	2.1	-	-
L00 - Acc WC 02	2.1	-	-
L00 - Acc WC 03	-	-	0.3
L00 - Chapel Circulation 02	2.1	-	-
L00 - Chapel Lobby	2.1	-	-
L00 - Childrens Church Entrance	2.1	-	-
L00 - Choir Robes	2.1	-	-
L00 - Circulation 03	2.1	-	-
L00 - Consulting Room 01	2.1	-	-
L00 - Counselling Room 01	2.1	-	-

Local mechanical ventilation and exhaust

Zone	Supply/extract SFP [W/(l/s)]	HR seasonal efficiency	Exhaust SFP [W/(l/s)]
L00 - Counselling Room 02	2.1	-	-
L00 - Counselling Room 03	2.1	-	-
L00 - Counselling Room 04	2.1	-	-
L00 - Ens	2.1	-	-
L00 - Facility Management Room 01	2.1	-	-
L00 - Female WCs	2.1	-	-
L00 - Hall Foyer	2.1	-	-
L00 - Hospitality Rm	2.1	-	-
L00 - Kitchen	2.1	-	-
L00 - Kitchen BOH	2.1	-	0.5
L00 - Lobby Play Area	2.1	-	-
L00 - Male WCs	2.1	-	-
L00 - Medical Reception Room	2.1	-	-
L00 - Ordinance Room	2.1	-	-
L00 - Pastorate	2.1	-	-
L00 - Restaurant	2.1	-	-
L00 - Sensory Room 01	2.1	-	-
L00 - WC 01	-	-	0.3
L00 - WC 02	-	-	0.3
L00 - WC 03	-	-	0.3
L00 - WCs	2.1	-	-
L00 - WSF Secretariat	2.1	-	-
L01 - Acc WC	2.1	-	-
L01 - Baptismal Room	2.1	-	-
L01 - Changing Room 01	2.1	-	-
L01 - Changing Room 02	2.1	-	-
L01 - Ens	2.1	-	-
L01 - Female WC	2.1	-	-
L01 - Kitchen 01	-	-	0.3
L01 - Kitchen 02	-	-	0.3
L01 - Lounge Lobby	-	-	0.3
L01 - Male WC	2.1	-	-
L01 - Media Editing	2.1	-	-
L01 - Nursing Room	2.1	-	-
L01 - Sensory Room 02	2.1	-	-
L01 - Storage 03	-	-	0.3
L01 - Store 02	-	-	0.3
L01 - Technical Room	2.1	-	-
L01 - WC 03	-	-	0.3
L01 - WC 04	-	-	0.3
L01 - WCs 01	2.1	-	-
L01 - WCs 02	-	-	0.3
L01 - WCs 05	-	-	0.3

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
L00 - 3-4 Yr Classroom 01	480	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
L00 - 3-4 Yr Classroom 02	580	-
L00 - 3-4 Yr Classroom 03	570	-
L00 - 5-7 Yr Classroom 01	580	-
L00 - 5-7 Yr Classroom 02	570	-
L00 - 5-7 Yr Classroom 03	580	-
L00 - Acc WC 01	20	-
L00 - Acc WC 02	20	-
L00 - Acc WC 03	20	-
L00 - Bookshop	450	-
L00 - Chapel	13580	-
L00 - Chapel Circulation 01	140	-
L00 - Chapel Circulation 02	140	-
L00 - Chapel Lobby	30	-
L00 - Childrens Church Entrance	150	-
L00 - Choir Robes	20	-
L00 - Circulation 01	40	-
L00 - Circulation 02	90	-
L00 - Circulation 03	40	-
L00 - Circulation 03	10	-
L00 - Circulation 04	60	-
L00 - Circulation 05	80	-
L00 - Circulation 06	50	-
L00 - Consulting Room 01	130	-
L00 - Counselling Room 01	60	-
L00 - Counselling Room 02	60	-
L00 - Counselling Room 03	60	-
L00 - Counselling Room 04	60	-
L00 - CSR Office	300	-
L00 - Ens	30	-
L00 - Facility Management Room	190	-
L00 - Female WCs	260	-
L00 - Foyer	1170	-
L00 - Gym	340	-
L00 - Hall Foyer	60	-
L00 - Hospitality Rm	440	-
L00 - Indoor Play Area	320	-
L00 - Kitchen	110	-
L00 - Kitchen BOH	450	-
L00 - Lobby	180	-
L00 - Lobby Play Area	10	-
L00 - LV Switch	60	-
L00 - Male WCs	190	-
L00 - Medical Reception Room	100	-
L00 - Multipurpose Hall	2400	-
L00 - Ordinance Room	140	-
L00 - Pastorate	210	-
L00 - Plant	340	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
L00 - Restaurant	350	-
L00 - Sanctuary Keepers Room	50	-
L00 - Sensory Room 01	200	-
L00 - Stairs 01	30	-
L00 - Stairs 02	50	-
L00 - Stairs 03	40	-
L00 - Storage	40	-
L00 - Substation	80	-
L00 - Toddler Classroom 01	580	-
L00 - Toddler Classroom 02	580	-
L00 - Toddler Classroom 03	580	-
L00 - WC 01	10	-
L00 - WC 02	10	-
L00 - WC 03	20	-
L00 - WCs	70	-
L00 - WSF Secretariat	130	-
L00 - WSF Secretariat Store	20	-
L01 - 8-10 Classroom 01	560	-
L01 - 8-10 Classroom 02	580	-
L01 - 8-10 Classroom 03	570	-
L01 - 11-12 Classroom 01	580	-
L01 - 11-12 Classroom 02	580	-
L01 - 11-12 Classroom 03	580	-
L01 - Acc WC	20	-
L01 - ARP Office	180	-
L01 - Asist Youth Pastor's Office	120	-
L01 - Auditorium Lobby 01	20	-
L01 - Auditorium Lobby 02	20	-
L01 - Auditorium Lobby 03	20	-
L01 - Baptismal Room	320	-
L01 - Board Room	270	-
L01 - Breakout	150	80
L01 - Changing Room 01	40	-
L01 - Changing Room 02	40	-
L01 - Church Office Circulation	100	-
L01 - Circulation 01	50	-
L01 - Circulation 02	70	-
L01 - Circulation 03	100	-
L01 - Circulation 04	80	-
L01 - Circulation 05	50	-
L01 - Counting Room	170	-
L01 - Ens	30	-
L01 - Female WC	110	-
L01 - Finance Office	150	-
L01 - Foyer	840	-
L01 - Junior Teens Church	1880	-
L01 - Kitchen 01	140	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
L01 - Kitchen 02	80	-
L01 - Lobby	10	-
L01 - Lounge	140	80
L01 - Lounge Lobby	10	-
L01 - Male WC	120	-
L01 - Media Editing	270	-
L01 - Meeting Room	260	-
L01 - Nursing Room	190	80
L01 - Office 01	140	-
L01 - Office 02	110	-
L01 - Office 03	120	-
L01 - Office 04	120	-
L01 - Office 05	110	-
L01 - Pastors Circulation	50	-
L01 - Pastor's Office	210	-
L01 - Senior Teens Church	1780	-
L01 - Sensory Room 02	200	-
L01 - Server Room	100	-
L01 - Stairs 01	40	-
L01 - Stairs 02	50	-
L01 - Stairs 03	40	-
L01 - Statutory Bodies	160	-
L01 - Statutory Body 01	190	-
L01 - Statutory Body 02	190	-
L01 - Statutory Body 03	180	-
L01 - Storage 03	0	-
L01 - Storage 04	20	-
L01 - Store 01	10	-
L01 - Store 02	20	-
L01 - Tech Storage	30	-
L01 - Technical Room	280	-
L01 - Teens Church Foyer	90	-
L01 - Waiting Space	100	80
L01 - WC 03	10	-
L01 - WC 04	20	-
L01 - WCs 01	70	-
L01 - WCs 02	50	-
L01 - WCs 05	30	-
L01 - Youth Pastor's Office	130	-

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?
L00 - 3-4 Yr Classroom 01	NO (-12.9%)	NO
L00 - 3-4 Yr Classroom 02	NO (-52.7%)	NO
L00 - 3-4 Yr Classroom 03	NO (-56.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L00 - 5-7 Yr Classroom 01	NO (-62.1%)	NO
L00 - 5-7 Yr Classroom 02	NO (-10.7%)	NO
L00 - 5-7 Yr Classroom 03	NO (-11.8%)	NO
L00 - Bookshop	NO (-72.3%)	NO
L00 - Chapel	NO (-39.3%)	NO
L00 - Consulting Room 01	N/A	N/A
L00 - Counselling Room 01	N/A	N/A
L00 - Counselling Room 02	N/A	N/A
L00 - Counselling Room 03	N/A	N/A
L00 - Counselling Room 04	N/A	N/A
L00 - CSR Office	YES (+4.6%)	NO
L00 - Facility Management Room	N/A	N/A
L00 - Gym	NO (-58.4%)	NO
L00 - Hospitality Rm	N/A	N/A
L00 - Indoor Play Area	NO (-78.9%)	NO
L00 - Kitchen BOH	N/A	N/A
L00 - Medical Reception Room	N/A	N/A
L00 - Multipurpose Hall	NO (-2.6%)	NO
L00 - Ordinance Room	N/A	N/A
L00 - Pastorate	N/A	N/A
L00 - Restaurant	NO (-14.3%)	NO
L00 - Sanctuary Keepers Room	N/A	N/A
L00 - Sensory Room 01	N/A	N/A
L00 - Toddler Classroom 01	NO (-11.9%)	NO
L00 - Toddler Classroom 02	NO (-11.5%)	NO
L00 - Toddler Classroom 03	NO (-11.8%)	NO
L00 - WSF Secretariat	N/A	N/A
L01 - 8-10 Classroom 01	NO (-45.8%)	NO
L01 - 8-10 Classroom 02	NO (-66%)	NO
L01 - 8-10 Classroom 03	NO (-67.1%)	NO
L01 - 11-12 Classroom 01	NO (-44.8%)	NO
L01 - 11-12 Classroom 02	NO (-44.5%)	NO
L01 - 11-12 Classroom 03	NO (-44.7%)	NO
L01 - ARP Office	NO (-63%)	NO
L01 - Asist Youth Pastor's Office	NO (-67.9%)	NO
L01 - Baptismal Room	N/A	N/A
L01 - Board Room	NO (-49.9%)	NO
L01 - Breakout	YES (+5%)	NO
L01 - Counting Room	NO (-50.5%)	NO
L01 - Finance Office	NO (-37.5%)	NO
L01 - Junior Teens Church	N/A	N/A
L01 - Lounge	NO (-46.3%)	NO
L01 - Media Editing	N/A	N/A
L01 - Meeting Room	NO (-30.2%)	NO
L01 - Nursing Room	NO (-96%)	NO
L01 - Office 01	NO (-51.9%)	NO
L01 - Office 02	NO (-42.4%)	NO
L01 - Office 03	NO (-43.6%)	NO
L01 - Office 04	NO (-45.7%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L01 - Office 05	NO (-37.4%)	NO
L01 - Pastor's Office	NO (-37.8%)	NO
L01 - Senior Teens Church	NO (-70.7%)	NO
L01 - Sensory Room 02	N/A	N/A
L01 - Server Room	N/A	N/A
L01 - Statutory Bodies	NO (-1.6%)	NO
L01 - Statutory Body 01	NO (-17.7%)	NO
L01 - Statutory Body 02	NO (-27.9%)	NO
L01 - Statutory Body 03	NO (-44.5%)	NO
L01 - Technical Room	N/A	N/A
L01 - Waiting Space	NO (-61.1%)	NO
L01 - Youth Pastor's Office	NO (-69.1%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the 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?	YES
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]	4828.7	4828.7
External area [m ²]	9406.8	9406.8
Weather	BEL	BEL
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	2082.43	0
Average U-value [W/m ² K]	0.22	0
Alpha value* [%]	10.51	10

* 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 Inst.: Hospitals and Care Homes
C2 Residential Inst.: Residential schools
C2 Residential Inst.: Universities and colleges
C2A Secure Residential Inst.
Residential spaces

85 D1 Non-residential Inst.: Community/Day Centre

D1 Non-residential Inst.: Libraries, Museums, and Galleries

15 D1 Non-residential Inst.: Education

D1 Non-residential Inst.: Primary Health Care Building
D1 Non-residential Inst.: Crown and County Courts
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	7.56	14.25
Cooling	0.32	0.21
Auxiliary	13.03	8.63
Lighting	12.43	21.48
Hot water	13.36	13.05
Equipment*	15.1	15.1
TOTAL **	46.71	57.63

* Energy used by equipment does not count towards the total for 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	17.71	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Indicative Target
Heating + cooling demand [MJ/m ²]	74.86	134.11
Primary energy* [kWh/m ²]	136.4	143.99
Total emissions [kg/m ²]	14.8	26.3

* 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: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	32.3	0	3.4	0	6.5	2.63	0	2.8	0	
Notional	92.4	0	10	0	4.6	2.56	0	----	----	
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	97.1	0	10.3	0	0.9	2.63	0	2.8	0	
Notional	164.3	0	17.8	0	0.9	2.56	0	----	----	
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	36.3	0	3.8	0	8.6	2.63	0	2.8	0	
Notional	120.1	0	13	0	11.2	2.56	0	----	----	
[ST] Single-duct VAV, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	13.2	20.8	1.6	1.7	28.4	2.34	3.44	3.19	5.5	
Notional	41.4	9.7	4.5	0.7	20.6	2.56	3.79	----	----	
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	36.1	31.5	2.2	1.8	20.3	4.55	4.84	4.64	6.47	
Notional	87.9	4.5	9.5	0.3	15.7	2.56	3.79	----	----	
[ST] Single-duct VAV, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	71	3.8	8.3	0.3	34.8	2.37	3.39	3.19	5.5	
Notional	135.2	7.5	14.7	0.6	20.6	2.56	3.79	----	----	
[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

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.13	RM00002F:Surf[6]
Floor	0.2	0.1	RM00002F:Surf[18]
Roof	0.15	0.15	RM000011:Surf[12]
Windows, roof windows, and rooflights	1.5	0.9	RM000011:Surf[13]
Personnel doors	1.5	1.6	RM00002E:Surf[0]
Vehicle access & similar large doors	1.5	-	No vehicle access doors in building
High usage entrance doors	1.5	-	No high usage entrance doors in building
U _{i-Typ} = Typical individual element U-values [W/(m²K)]		U _{i-Min} = Minimum individual element U-values [W/(m²K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	3