

From: General Manager- Ox Pasture Hall Hotel
Sent: 15 April 2022 09:20
To: Planning
Cc: Shaun Conway; Oxpasturehallhotel Info; Reception Ox Pasture Hall
Subject: Re: Compliance for Condition 17 - NYM/2022/0179 Ox Pasture Hall Hotel
Attachments: Ox Pasture Hall Leisure Complex 2020_LPG Gas Heating_brukl (1).pdf; Ox Pasture Hall Leisure Complex 2020_Air Source + LPG Gas Heating_brukl.pdf

Dear Wendy,

We would like to use an Air Source Heat Pump to comply with condition 17.

Please see email below from Iain Robinson + Calculations (attached to this email) showing 10% CO2 reductions achieved by using an Air Source Heat Pump and an LPG Gas Boiler.

Kind regards,

Jay Badsha
General Manager
Ox Pasture Hall Hotel

www.oxpasturehallhotel.com
[Click Below to visit us on Facebook](http://www.facebook.com/oxpasture.hall?ref=stream)
<http://www.facebook.com/oxpasture.hall?ref=stream>

----- Forwarded message -----

From:
Date: Mon, Feb 15, 2021 at 3:50 PM
Subject: SBEM Calculations 10% reduction in CO2
To: General Manager- Ox Pasture Hall

Jay

Please find attached the SBEM Compliance Reports under Part L2A of the Building Regulations showing the CO2 reductions achieved by **using an Air Source Heat Pump and an LPG Gas Boiler** against a standard LPG Gas boiler.

The Building Target Co2 emissions figure using LPG Gas Boiler as a heating form is 113.45 KgCo2/m2/yr. and compliance is shown by the Building Emissions rate being 111.47 KgCo2/m2/yr.

To comply with the planning condition 17 (a 10% reduction in Co2 is required) an Air Source Heat Pump and an LPG Gas Boiler are proposed. The Target Emissions Rate is 83.4 KgCo2/m2/yr. and the Building Emissions Rate achieved is 70.5KgCo2/m2/yr. thus showing compliance, with Building Regulations

The **overall reduction in Co2 by using an Air Source Heat Pump and an LPG Gas Boiler is 37.85% over a traditional LPG gas boiler, thus showing compliance with the planning condition.** The Air source Heat Pump is heating approximately 60% of the building with the LPG Boiler heating the remaining 40%

Any questions please come back to me

Kind regards

Iain Robinson
Architectural & Creative Design Ltd

Architectural & Creative Design Ltd 1A Princess Road York YO32 5UE - Co No 75813225

www.architecturalcdesign.co.uk

Elmhurst Licensed On Construction Domestic Energy Assessors (OCDEA) and Commercial Building Energy Assessors (iSBEM)

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Ⓢ

Project name

Hotel Leisure Complex

As designed

Date: Mon Feb 15 12:45:51 2021

Administrative information**Building Details**

Address: Ox Pasture Hall Country House Hotel, Lady Ediths Drive, SCARBOROUGH, YO12 5TD

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.2

Interface to calculation engine: iSBEM

Interface to calculation engine version: v5.6.a

BRUKL compliance check version: v5.6.a.1

Owner Details

Name: Ox Pasture Hall Country House Hotel

Telephone number: Information not provided by the user

Address: Lady Edith's Drive, SCARBOROUGH, YO12 5TD

Certifier details

Name: Iain Robinson

Telephone number: 01904490686

Address: 1A Princess Road, YORK, YO32 5UE

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	113.5
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	113.5
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	111.5
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	Wall.S.1
Floor	0.25	0.12	0.14	Floor.1.1.1
Roof	0.25	0.22	0.22	Roof.1.1.1.1.1
Windows***, roof windows, and rooflights	2.2	1.4	1.4	W.S.1
Personnel doors	2.2	1.4	1.4	D.N.1.1
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

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)]

* 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	7

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- LPG Boiler

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.93	-	-	-	-
Standard value	0.93*	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 LPG single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.87. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

1- Default HWS

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.013
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	
	A	B	C	D	E	F	G	H	I	Zone	Standard	
	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
ZO/01/04	-	-	-	1	-	-	-	-	-	0.89	0.5	

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
ZO/01/04	-	100	-	2652
ZO/01/07	50	-	-	485
ZO/01/01	-	100	-	732
ZO/01/02	-	100	-	596
ZO/01/03	-	100	-	170
ZO/01/05	-	100	-	306
ZO/01/06	-	100	-	414
ZO/02/01	-	100	-	538
ZO/02/02	-	100	-	151

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?
ZO/01/04	YES (+13.7%)	NO
ZO/01/01	NO (-62.8%)	NO
ZO/01/02	NO (-69.3%)	NO
ZO/01/03	NO (-33.6%)	NO
ZO/02/01	NO (-69.4%)	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?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	1320.5	1320.5
External area [m ²]	2933.8	2933.8
Weather	LEE	LEE
Infiltration [m ³ /hm ² @ 50Pa]	7	3
Average conductance [W/K]	712.34	996.92
Average U-value [W/m ² K]	0.24	0.34
Alpha value* [%]	17.93	13.56

* 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
100	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
	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	56	76.57
Cooling	0	0
Auxiliary	5.56	3.71
Lighting	17.58	11.58
Hot water	356.71	362.09
Equipment*	45.81	45.81
TOTAL**	435.85	453.94

* 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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	285.73	328.22
Primary energy* [kWh/m ²]	520.88	523.89
Total emissions [kg/m ²]	111.5	113.5

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

HVAC Systems Performance

System Type	Heat dem MJ/m ²	Cool dem MJ/m ²	Heat con kWh/m ²	Cool con kWh/m ²	Aux con kWh/m ²	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling									
Actual	50.8	127.2	0	0	8.8	0	0	0	0
Notional	150.4	24.4	0	0	7.6	0	0	----	----
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [HFT] LPG, [CFT] Electricity									
Actual	248.1	81.6	78.8	0	4.2	0.87	0	0.93	0
Notional	317.8	73	107.8	0	2.1	0.82	0	----	----

Key to terms

Heat dem [MJ/m ²]	= Heating energy demand
Cool dem [MJ/m ²]	= Cooling energy demand
Heat con [kWh/m ²]	= Heating energy consumption
Cool con [kWh/m ²]	= Cooling energy consumption
Aux con [kWh/m ²]	= 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	Wall.S.1
Floor	0.2	0.08	Floor.1.1.1.1.1
Roof	0.15	0.22	Roof.1.1.1.1.1
Windows, roof windows, and rooflights	1.5	1.4	W.S.1
Personnel doors	1.5	1.4	D.N.1.1
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
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	7

Project name

Hotel Leisure Complex

As designed

Date: Mon Feb 15 15:14:38 2021

Administrative information**Building Details**

Address: Ox Pasture Hall Country House Hotel, Lady Ediths Drive, SCARBOROUGH, YO12 5TD

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.2

Interface to calculation engine: iSBEM

Interface to calculation engine version: v5.6.a

BRUKL compliance check version: v5.6.a.1

Owner Details

Name: Ox Pasture Hall Country House Hotel

Telephone number: Information not provided by the user

Address: Lady Edith's Drive, SCARBOROUGH, YO12 5TD

Certifier details

Name: Iain Robinson

Telephone number: 01904490686

Address: 1A Princess Road, YORK, YO32 5UE

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	83.4
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	83.4
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	70.5
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	Wall.S.1
Floor	0.25	0.12	0.14	Floor.1.1.1
Roof	0.25	0.22	0.22	Roof.1.1.1.1.1
Windows***, roof windows, and rooflights	2.2	1.4	1.4	W.S.1
Personnel doors	2.2	1.4	1.4	D.N.1.1
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

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)]

* 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	7

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- Air Source Heat Pump

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.5	-	-	-	-
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. For types <=12 kW output, refer to EN 14825 for limiting standards.					

2- LPG Gas Boiler

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1.66	-	-	-	-
Standard value	0.93*	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 LPG single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.87. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

1- Default HWS

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.013
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	
	A	B	C	D	E	F	G	H	I	Zone	Standard	
	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
ZO/01/04	-	-	-	1	-	-	-	-	-	0.89	0.5	

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
	60	60	22	
ZO/01/04	-	100	-	2652
ZO/01/07	50	-	-	485

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
ZO/01/01		-	100	-	732
ZO/01/02		-	100	-	596
ZO/01/03		-	100	-	170
ZO/01/05		-	100	-	306
ZO/01/06		-	100	-	414
ZO/02/01		-	100	-	538
ZO/02/02		-	100	-	151

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?
ZO/01/04	YES (+13.7%)	NO
ZO/01/01	NO (-62.8%)	NO
ZO/01/02	NO (-69.3%)	NO
ZO/01/03	NO (-33.6%)	NO
ZO/02/01	NO (-69.4%)	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?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	1320.5	1320.5
External area [m ²]	2933.8	2933.8
Weather	LEE	LEE
Infiltration [m ³ /hm ² @ 50Pa]	7	3
Average conductance [W/K]	712.34	996.92
Average U-value [W/m ² K]	0.24	0.34
Alpha value* [%]	17.93	13.56

* 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
100	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
	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	23.39	34.24
Cooling	0	0
Auxiliary	5.56	3.71
Lighting	17.58	11.58
Hot water	94.78	122.04
Equipment*	45.81	45.81
TOTAL**	141.31	171.57

* 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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	297.5	328.22
Primary energy* [kWh/m ²]	413.4	489.32
Total emissions [kg/m ²]	70.5	83.4

* 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] No Heating or Cooling									
Actual	50.8	127.2	0	0	8.8	0	0	0	0
Notional	150.4	24.4	0	0	7.6	0	0	---	---
[ST] Central heating using water: floor heating, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	248.4	84.7	21	0	4.1	3.29	0	3.5	0
Notional	309	64.1	35.3	0	2.1	2.43	0	---	---
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] LPG, [CFT] Electricity									
Actual	286.5	79.7	50.9	0	4.5	1.56	0	1.66	0
Notional	331.2	86.4	67.7	0	2.2	1.36	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	Wall.S.1
Floor	0.2	0.08	Floor.1.1.1.1.1
Roof	0.15	0.22	Roof.1.1.1.1.1
Windows, roof windows, and rooflights	1.5	1.4	W.S.1
Personnel doors	1.5	1.4	D.N.1.1
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
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	7