Project Documentation

Passivhaus database ID: 4744

CESTARIA

The first Certified Passive House in the touristic sector in Portugal

Passivhaus Designer **João Marcelino** jm@homegrid.pt

Data of building

Year of construction	2015	**Space heating**	**13** **kWh/(m²a)**
U-value external wall	0.298 W/(m²K)		
U-value basement ceiling	0.408 W/(m²K)	**Primary Energy Renewable (PER)**	31 kWh/(m²a)
U-value roof	0.231 W/(m²K)	**Generation of renewable energy**	24 kWh/(m²a)
U-value window	0.91 W/(m²K)	**Non-renewable Primary Energy (PE)**	55 kWh/(m²a)
Heat recovery	82 %	Pressure test n_{50}	0.41 h^{-1}
Special features	Solar collectors for hot water generation. The project adopted a holistic approach including the performance in energy, water and materials. This project was certified by the Portuguese sustainable assessment system LiderA, achieving a sustainable class of factor 10 (A++).		

Brief Description

The previous building was demolished to give rise to "Cestaria" and it had to maintain the appearance of the facade of the demolished building. This is a Touristic unit with 2 apartments, one in each floor. Each apartment has 2 bedrooms, kitchen and living room. This building is located in Costa Nova Beach, Ílhavo, and it's situated between the Ria de Aveiro and the North Atlantic Ocean Sea. The main building orientation is East/West, with the main elevation to East. The climate is in a transition range between Oceanic climate and Mediterranean climate.

Interior Photos


Photo credits: Gonçalo Miller


Photo credits: Gonçalo Miller


Photo credits: Gonçalo Miller


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Photo credits: Gonçalo Miller


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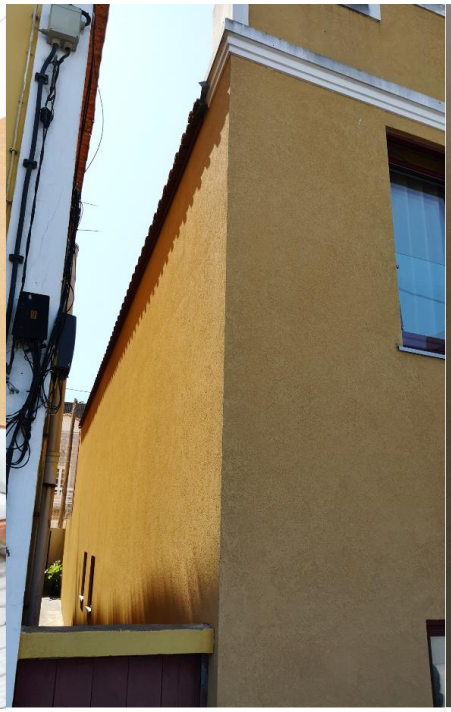
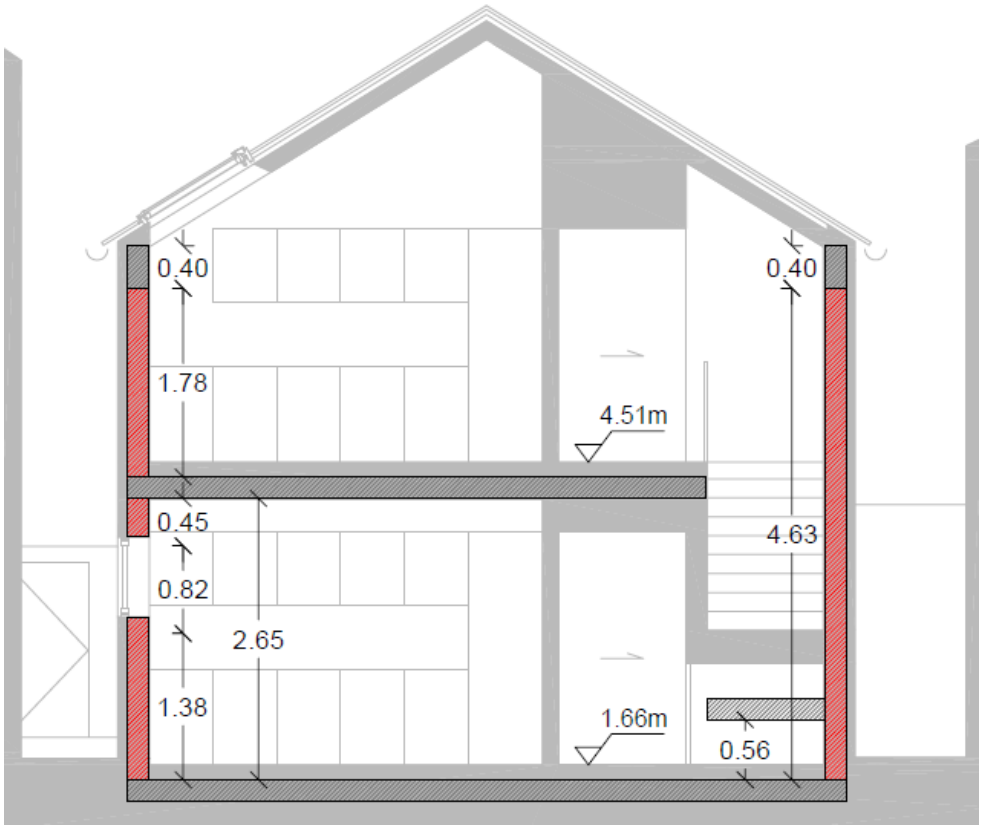
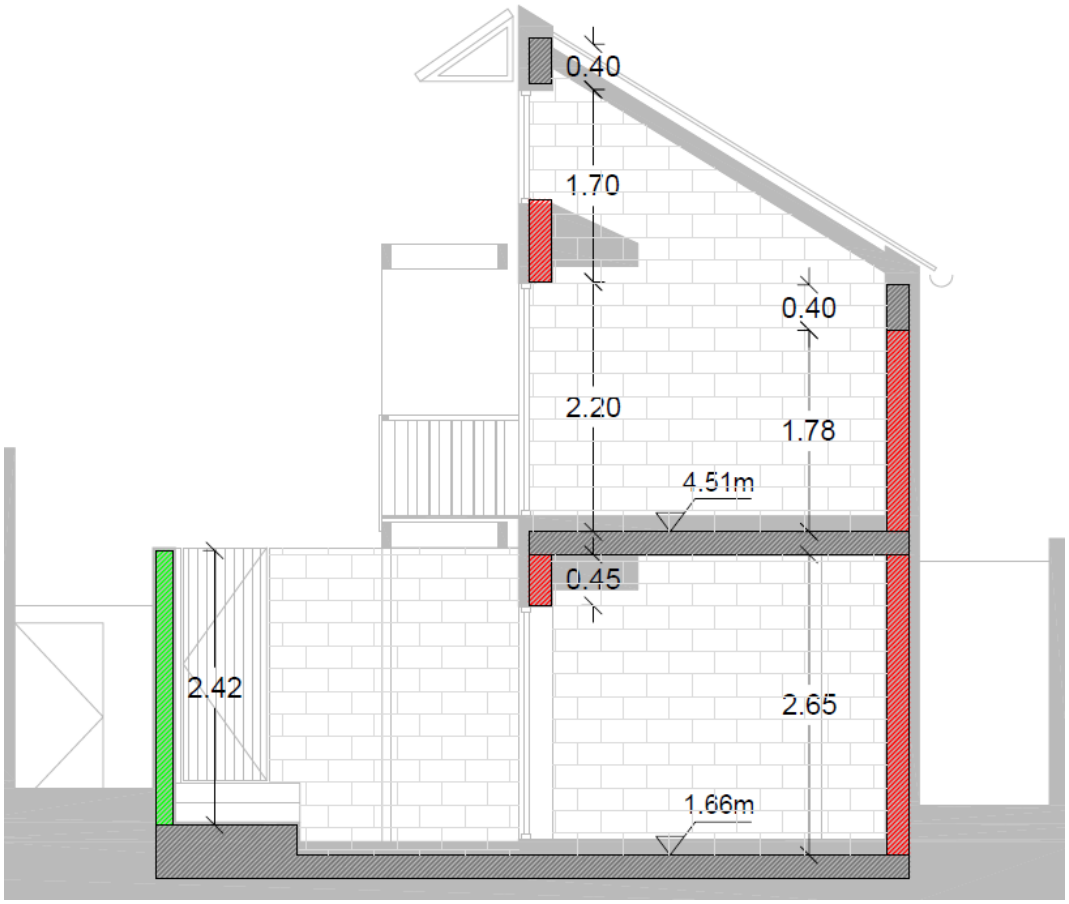
Exterior Photos

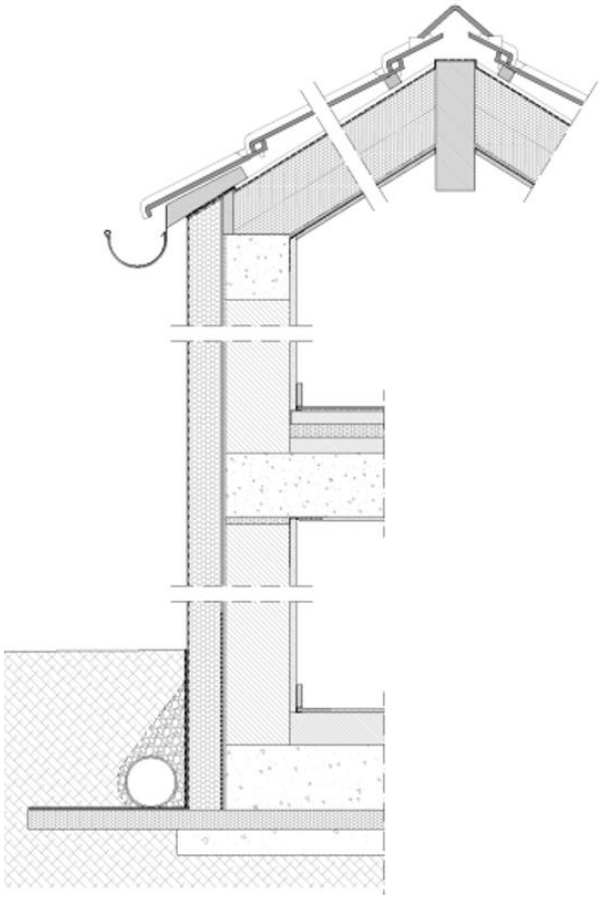


Cross Section

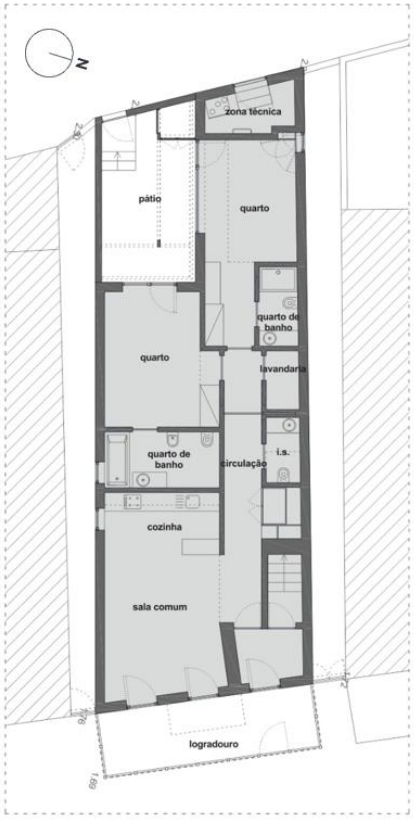




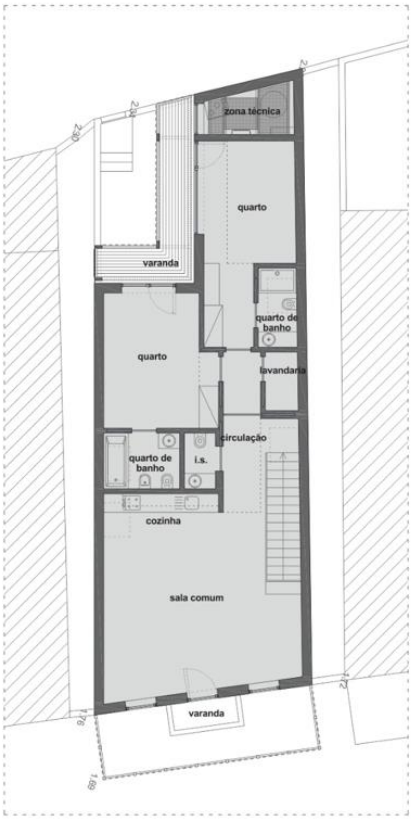

2.20
2.34
2.08
2.22
2.34
4.51m
0.45
2.20
2.65
2.65
0.60
1.66m
1.66m



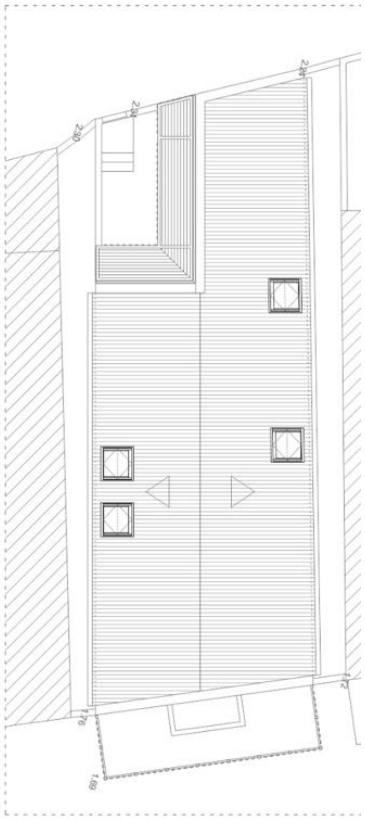
Plans



Ground floor plan



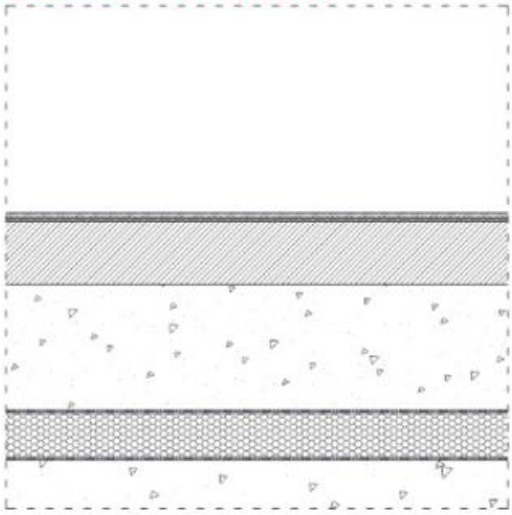
First floor plan


Roof plan

Building solutions - ground floor

Ground floor insulation: 6 cm

U value = 0,41 W/m²K



Assembly no.						Interior insulation?
03ud	Floor slab					no

Heat transmission resistance [m²K/W]

Orientation of building element	0.17	interior R_{si}	0.17
Adjacent to	0	exterior R_{se}	0.00

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
porcelain tiles	1.300					10
screed	1.000					100
Concrete	2.300					250
XPS	0.034					60
lightweight concrete	0.500					150

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
100%			57.0 cm

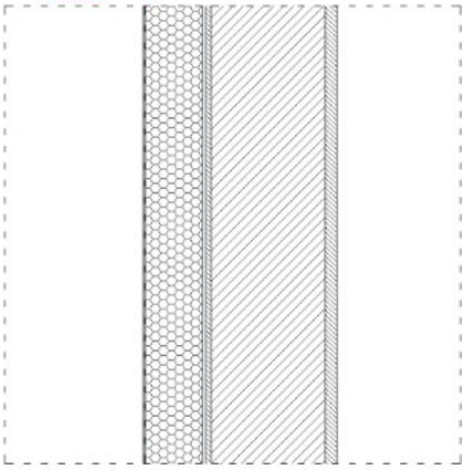
U-value supplement: W/(m²K)

U-value: 0.408 W/(m²K)

Building solutions - wall

Wall insulation: 10 cm

U value = 0,28 W/m²K



Assembly no.	Building assembly description					Interior insulation?
01ud	Exterior wall					no

Heat transmission resistance [m²K/W]

Orientation of building element: 0.13 — interior R_{si}: 0.13

Adjacent to: 0.04 — exterior R_{se}: 0.04

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
interior plaster	1.300					20
Artebel BTE thermal block	0.215	concrete	2.300			200
exterior plaster	1.300					10
EPS	0.038					100

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
81%	18.8%		33.0 cm

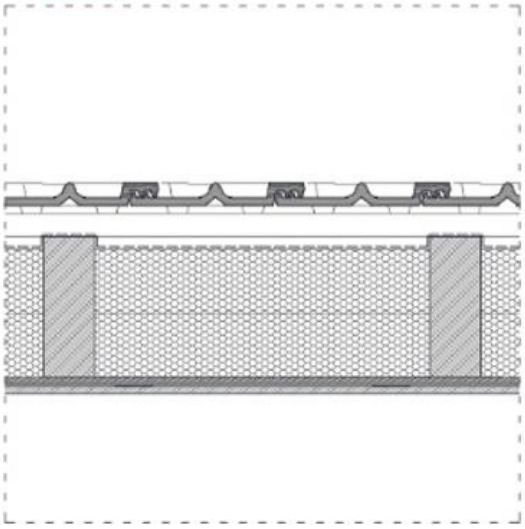
U-value supplement: W/(m²K)

U-value: 0.298 W/(m²K)

Building solutions - roof

Roof insulation: 20 cm

U value = 0,23 W/m²K



Assembly no.						Interior insulation?
02ud	Roof					no

Heat transmission resistance [m²K/W]

Orientation of building element	0.1	interior R_{si}	0.10
Adjacent to	0.04	exterior R_{se}	0.04

Area section 1	λ [W/(mK)]	Area section 2 (optional)	λ [W/(mK)]	Area section 3 (optional)	λ [W/(mK)]	Thickness [mm]
XPS	0.036	timber beams	0.130			200
OSB board	0.130					9
wood board	0.130					12

Percentage of sec. 1	Percentage of sec. 2	Percentage of sec. 3	Total
85%	15.4%		22.1 cm

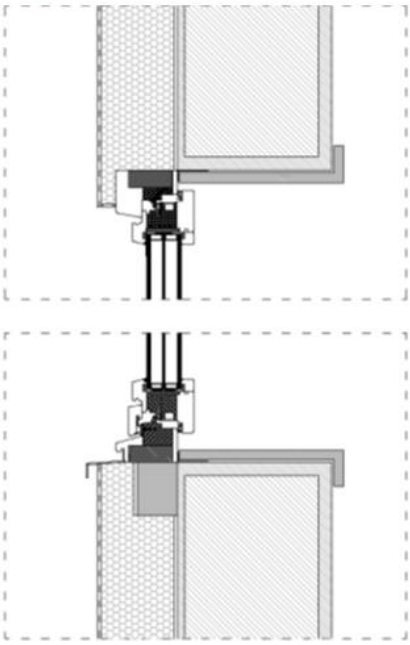
U-value supplement: W/(m²K)

U-value: 0.231 W/(m²K)

Building solutions - window

Windows

Uw value = 0,85 W/(m²K)



Frame

Cruz & Oliveira, EPW CN92

Wood frame, SWISSPACER Ultimate

Uf: 0,81 W/(m²K)

U_w-value = 91 W/(m²K)

Glazing

SGG triple glazing 4:/16/4/16/:4 Ar 90%

U_g-value = 0.65 W/(m²K)

g -value = 50 %

Airtightness

ITeCons

U C

Universidade de Coimbra

Conclusões / Resultados combinados:

	Resultado	Intervalo confiança 95%	
V_{50} [m^3/h]	227.5	218.8	236.5
n_{50} [h^{-1}]	0.41	0.39	0.42
q_{50} [$m^3/(h \cdot m^2)$]	0.40	0.38	0.41
w_{50} [$m^3/(h \cdot m^2)$]	1.27	1.22	1.32

Ensaio realizado por: Márcio Gonçalves

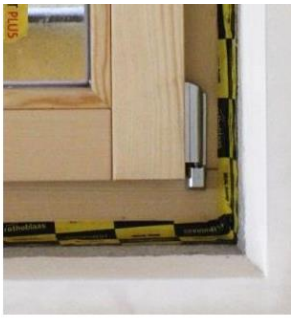
Autoria Técnica: Márcio Gonçalves

Responsabilidade Técnica

Nuno Simões
(Supervisor Técnico e Científico)

A Direcção

OEF005/15



Final pressure test n_{50} [h^{-1}] = 0.41

Over-pressure n_{50} [h^{-1}] = 0.37

Negative-pressure n_{50} [h^{-1}] = 0.44

Performing Person / Company = Márcio Gonçalves / ITecons

Airtightness solutions

Roof: OSB panel with an internal barrier PE 40, DZ536110 from Rothoblaas fixed together with Seal Band DZ100127from Rothoblaas;

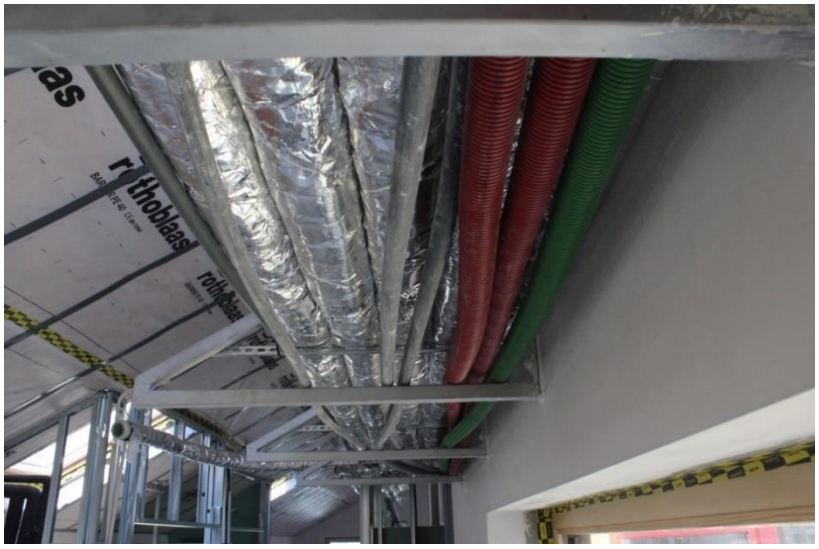
Connection Wall x Roof: Border Band, DZ100285 from Rothoblaas;

Walls: 15 mm of plaster;

Connection Wall x Floor: Soudaseal HT from Soudal;

Floor: Concrete;

Ventilation system



For ventilation was used the EN1329 certificated circular pipes, PVC series B type, for new air inlet and air extraction, properly protected with thermal insulation with IBR 30 mm thick, as features in the annexes.

Two ventilation units with heat recovery (one per each dwelling).

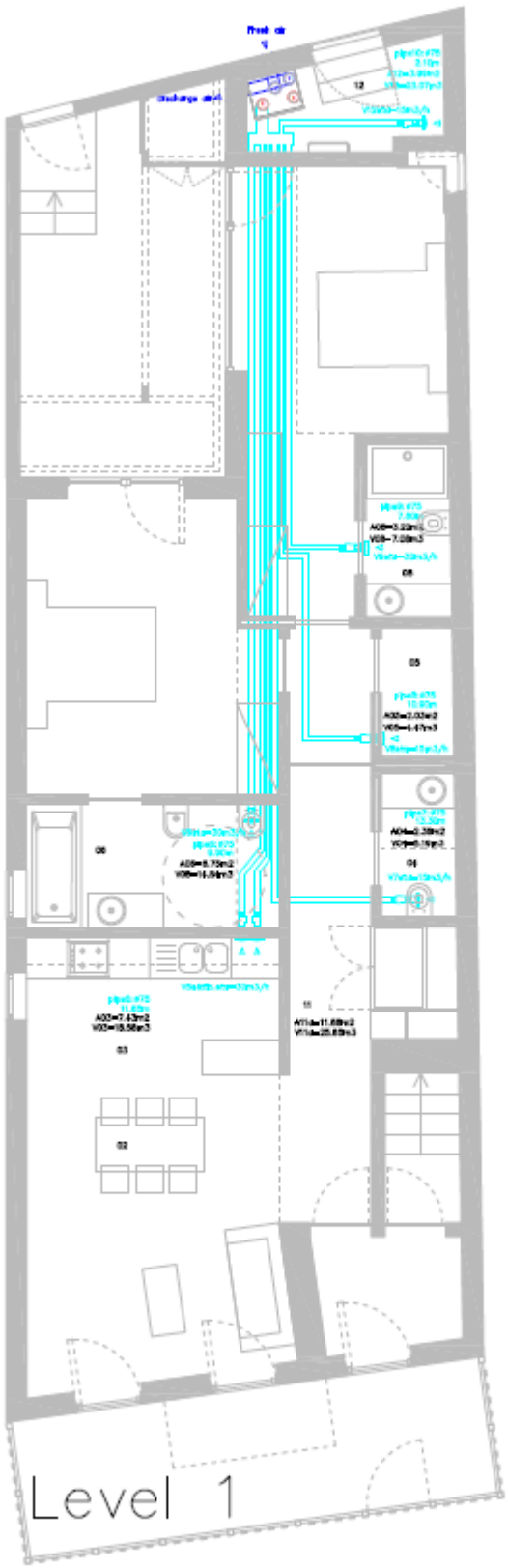
Category: **Heat recovery unit**

Manufacturer: **Nilan A/S 8722, DENMARK**

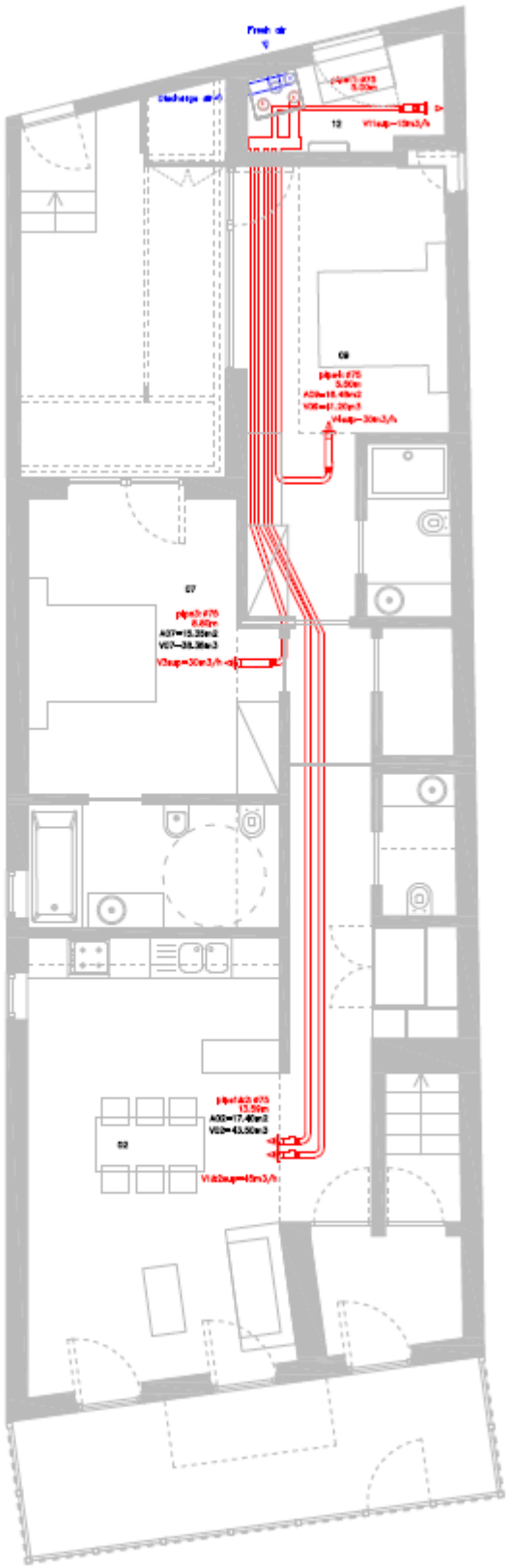
Product name: **Comfort CT 300**

Effective heat recovery rate $\eta_{HR,eff}$ **= 85 %**

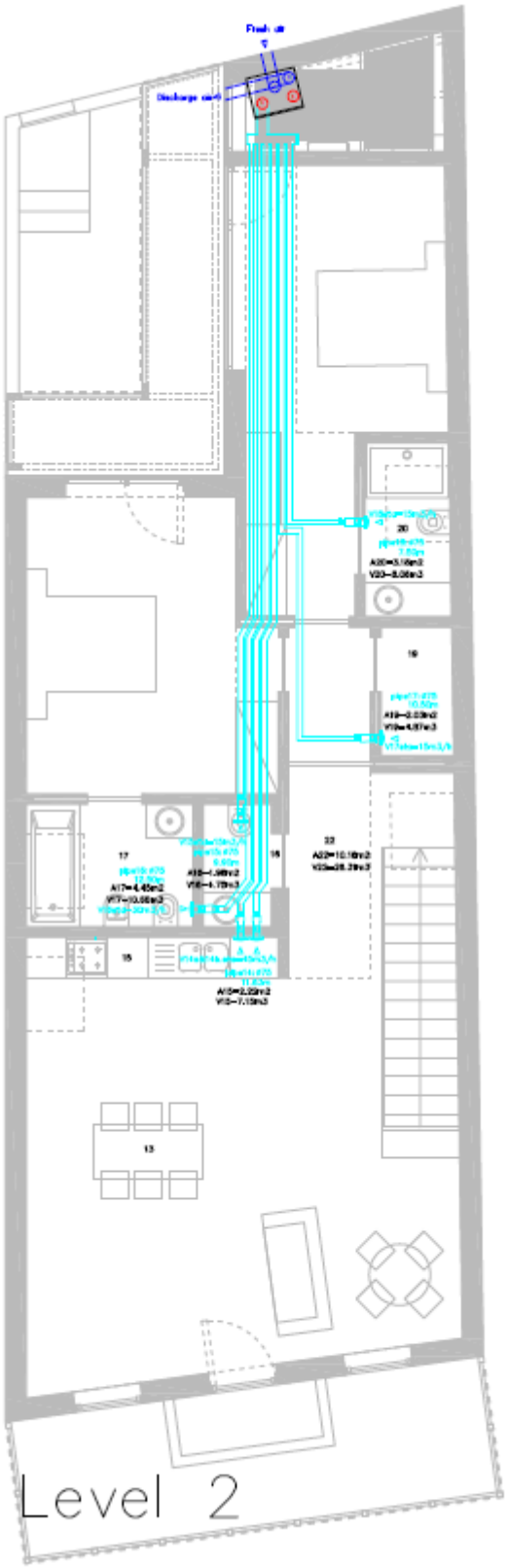
Electric power consumption $P_{el} \leq 0.25$ **Wh/m³**



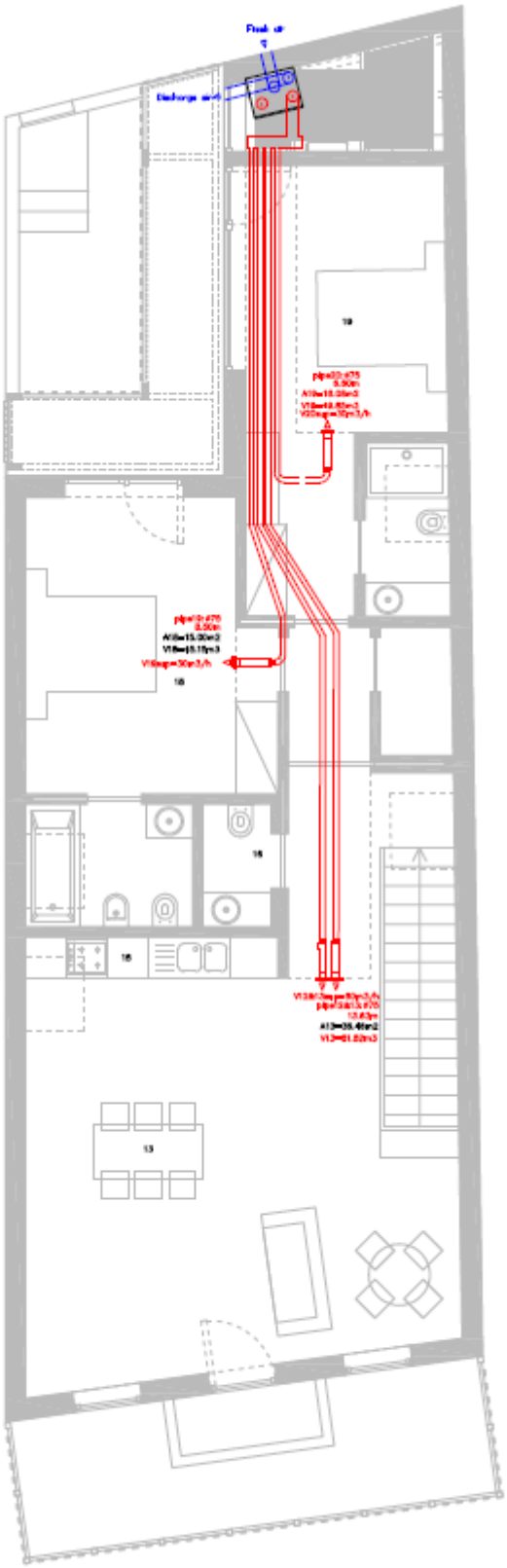
Veta=135m3/h



Vsup=135m3/h



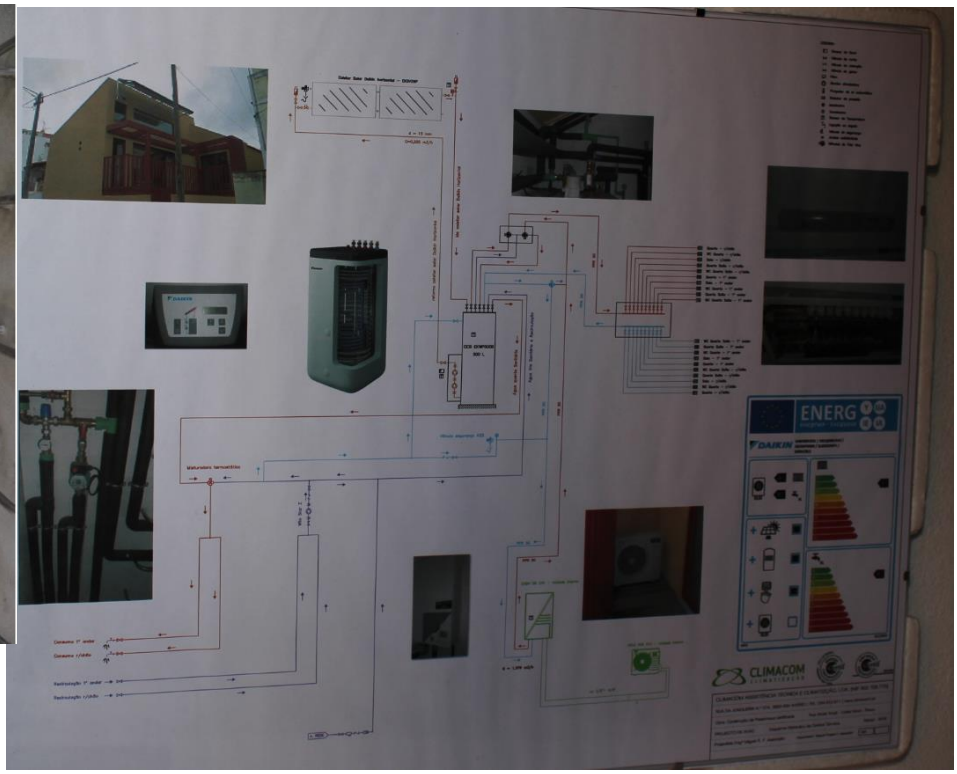
Veta=105m3/h



Vsup=105m3/h

Heating installation

Exaust air heat pump system Daikin Altherma EHBX08C3V; radiators on bathroom, bedrooms and living rooms.



Domestic hot water

Exaust air heat pump system Daikin Altherma EHBX08C3V; thermal solar system: 2 solar panels Daikin -EKSH-P (1300X2000mm); storage Daikin - EKHWP 500 B (500litres)

PHPP

Passive House Verification

Building:	Cestaria		
Street:	Largo Arrais de Ança - Costa Nova do Prado		
Postcode/City:	3830-450	Ílhavo	
Province/Country:	Aveiro	PT-Portugal	
Building type:	Touristic unit - 2 apartments, new build		
Climate data set:	ud---01-Ílhavo_Porto with correction by PHI		
Climate zone:	5: Warm	Altitude of location:	5 m
Home owner / Client:	AIT Invest, S.A.		
Street:	Rua do Breiner, nº353		
Postcode/City:	4050-127	Porto	
Province/Country:	Porto	PT-Portugal	

Architecture:	Homegrid		
Street:	Avª 25 de Abril, 33, 3º Andar Esq Frente		
Postcode/City:	3830-044	Ílhavo	
Province/Country:	Aveiro	PT-Portugal	
Energy consultancy:	Passivhaus Institut		
Street:	Rheinstr. 44/46		
Postcode/City:	64283	Darmstadt	
Province/Country:	Hesse	DE-Germany	
Mechanical system:	Climacom		
Street:	Rua da Junqueira, 37		
Postcode/City:	3800-034	Cacia	
Province/Country:	Aveiro	PT-Portugal	
Certification:	Passivhaus Institut		
Street:	Rheinstr. 44/46		
Postcode/City:	64283	Darmstadt	
Province/Country:	Hesse	DE-Germany	

Year of construction:	2015	Interior temperature winter [°C]:	20.0	Interior temp. summer [°C]:	25.0
No. of dwelling units:	2	Internal heat gains (IHG) heating case [W/m²]:	2.7	IHG cooling case [W/m²]:	2.7
No. of occupants:	4.4	Specific capacity [Wh/K per m² TFA]:	180	Mechanical cooling:	

Specific building characteristics with reference to the treated floor area

					Criteria	Alternative criteria	Fullfilled?[2]
	Treated floor area	m²	178.4				
Space heating	Heating demand	kWh/(m²a)	13	≤	15	-	yes
	Heating load	W/m²	10	≤	-	10	
Space cooling	Cooling & dehum. demand	kWh/(m²a)	-	≤	-	-	-
	Cooling load	W/m²	-	≤	-	-	
	Frequency of overheating (> 25 °C)	%	3	≤	10		yes
	Frequency excessively high humidity (> 12 g/kg)	%	11	≤	20		yes
Airtightness	Pressurization test result n_{50}	1/h	0.4	≤	0.6		yes
Non-renewable Primary Energy (PE)	PE demand	kWh/(m²a)	55	≤	-		-
Primary Energy Renewable (PER)	PER demand	kWh/(m²a)	31	≤	60	60	yes
	Generation of renewable energy	kWh/(m²a)	24	≥	-	-	

[2] Empty field: Data missing; '-': No requirement

I confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The PHPP calculations are attached to this verification.

Passive House Classic? yes

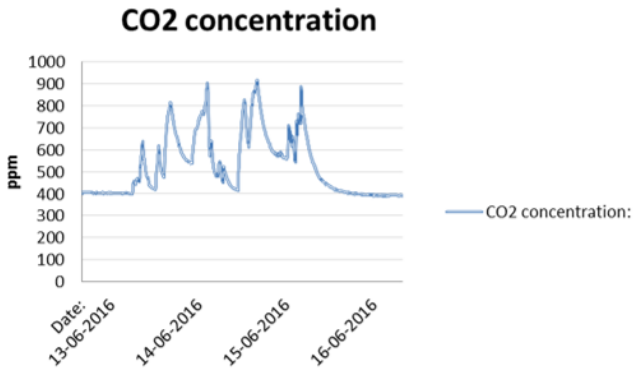
Task:	First name:	Surname:	Signature:
2-Certifier	Susanne	Theumer	

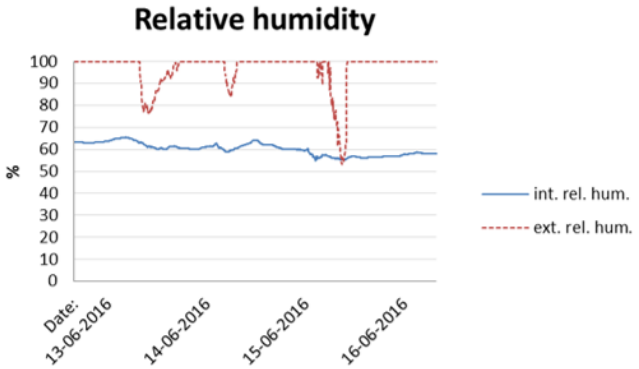
Certificate ID	Issued on:	City:
	03/03/16	Darmstadt

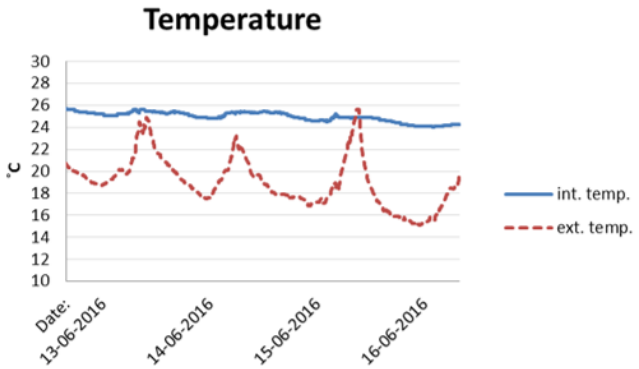
Building operation

Monitoring of the first building operation – upper floor:

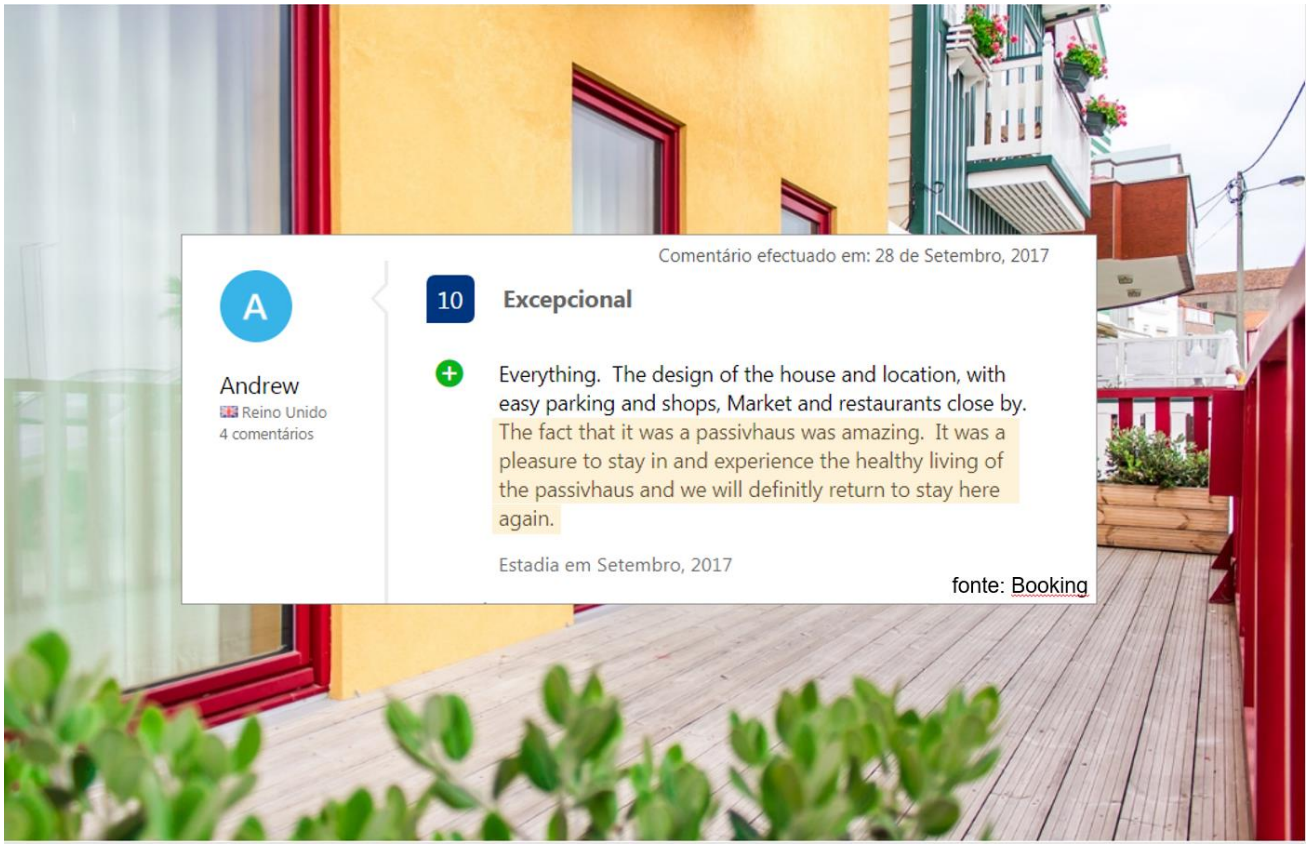
- CO2 concentration below **900 ppm**
- Relative humidity between **56/66 %**
- Temperature around **25°C**

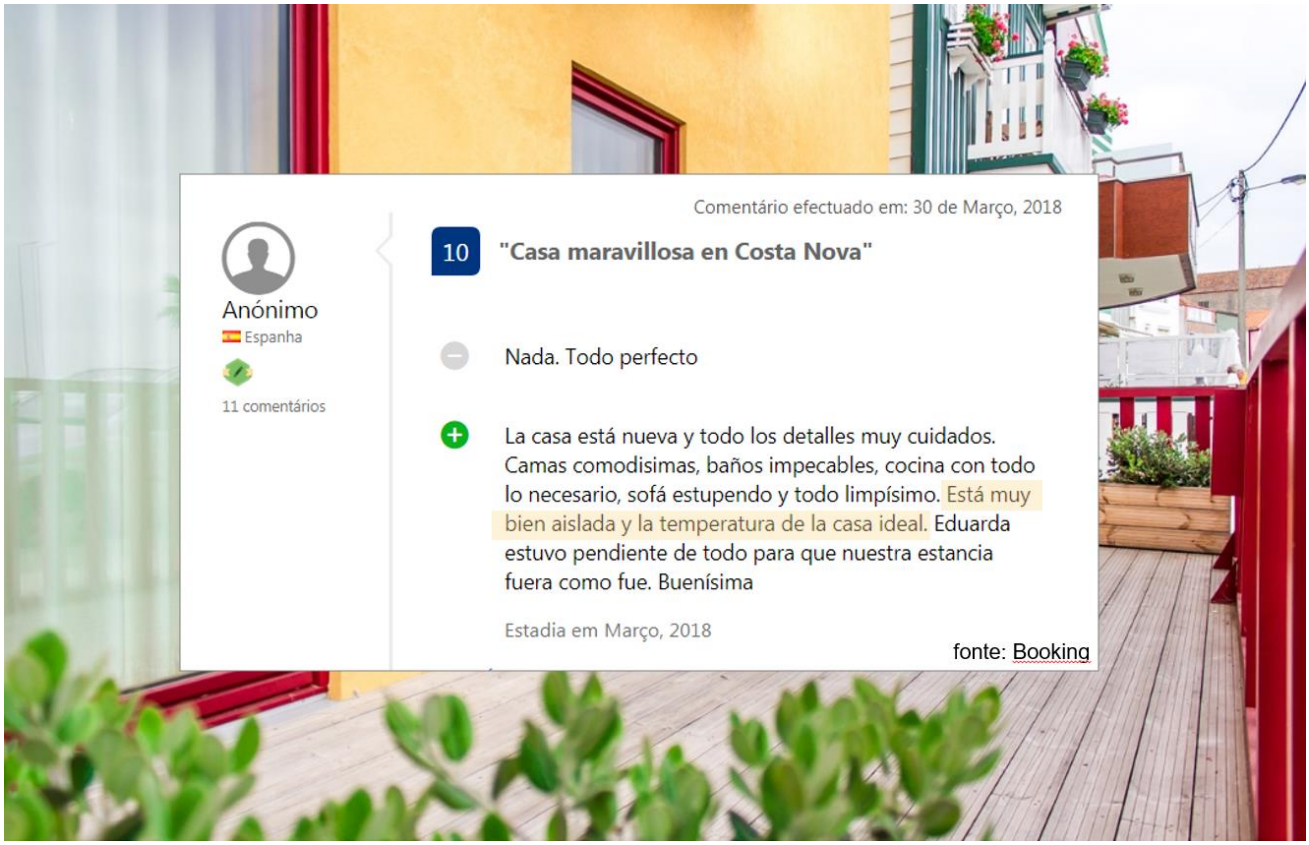






Users feedback





fonte: Booking

Author of Project documentation

24.07.2019

João José de Jesus Marcelino