

# Project Documentation Gebäude-Dokumentation



## Abstract | Zusammenfassung



### Single-family dwelling in a densely populated urban area, Bucharest

#### Data of building | Gebäudedaten

Year of construction Baujahr	2023	<b>Space heating</b> <b>Heizwärmebedarf</b>	<b>13</b> <b>kWh/(m<sup>2</sup>a)</b>
U-value external wall U-Wert Außenwand	0,107 W/(m <sup>2</sup> K)		
U-value basement U-Wert Kellerdecke	0,131 W/(m <sup>2</sup> K)	Primary Energy Renewable (PER) Erneuerbare Primärenergie (PER)	51 kWh/(m <sup>2</sup> a)
U-value roof U-Wert Dach	0,074 W/(m <sup>2</sup> K)	Generation of renewable Energy Erzeugung erneuerb. Energie	5 kWh/(m <sup>2</sup> a)
U-value window U-Wert Fenster	0,76 W/(m <sup>2</sup> K)	Non-renewable Primary Energy (PE) Nicht erneuerbare Primärenergie (PE)	kWh/(m <sup>2</sup> a)
Heat recovery Wärmerückgewinnung	83 %	Pressurization test n <sub>50</sub> Drucktest n <sub>50</sub>	0,4 h <sup>-1</sup>
Special features Besonderheiten	Solar panels for DHW, ventilated wood shingle façade PHI certified fireplace		

## Brief Description

### Detached single-family house in Bucharest

This passive house in Bucharest sits in a dense residential area on a narrow plot. Because a southern neighboring building reduces solar gains, the new structure was placed on the plot's edge and attached to the northern building. A large south-facing window at the top of the staircase significantly increases the amount of light inside. Thanks to its rectangular shape and excellent TFA ratio, the heating demand stays under 13 kWh/(m<sup>2</sup>a).

The structural stability of the existing northern building required the design team to use underpinning infrastructure. Consequently, the underground insulation is a mixture of XPS and glass foam gravel.

To soften the severe volume, the exterior is finished with a ventilated wood shingle façade. Wooden frames were used for the windows, and wooden furniture and ceramics complete the beautiful interior.

Though unusual for a passive house, the living room's highlight is a fireplace, which is the center of cozy winter evenings spent with family.

## Responsible project participants

### Verantwortliche Projektbeteiligte

Architect Entwurfsverfasser	arch.Mihaela Dumitru Birou Arhitectură Metropolitană S.R.L.
Implementation planning Ausführungsplanung	Vlad Baltagi
Building systems Haustechnik	Zal Investments & Co S.A.
Structural engineering Baustatik	eng. Mihnea Costache S.C. STENCO ENGINEERING S.R.L.
Building physics Bauphysik	arch.Cristina Tartau CREATIVE ENGINEERING OFFICE
Passive House project planning Passivhaus-Projektierung	arch.Cristina Tartau CREATIVE ENGINEERING OFFICE
Construction management Bauleitung	-

## Certifying body

### Zertifizierungsstelle

Passivhaus Institut Darmstadt  
www.passiv.de

## Certification ID

### Zertifizierungs ID

**8081**

Project-ID ([www.passivehouse-database.org](http://www.passivehouse-database.org))  
Projekt-ID ([www.passivhausprojekte.de](http://www.passivhausprojekte.de))

## Author of project documentation

### Verfasser der Gebäude-Dokumentation

arch.Cristina Tartau

CREATIVE ENGINEERING OFFICE

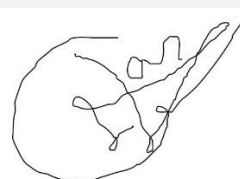
Date

Datum

02 December 2025

Signature

Unterschrift



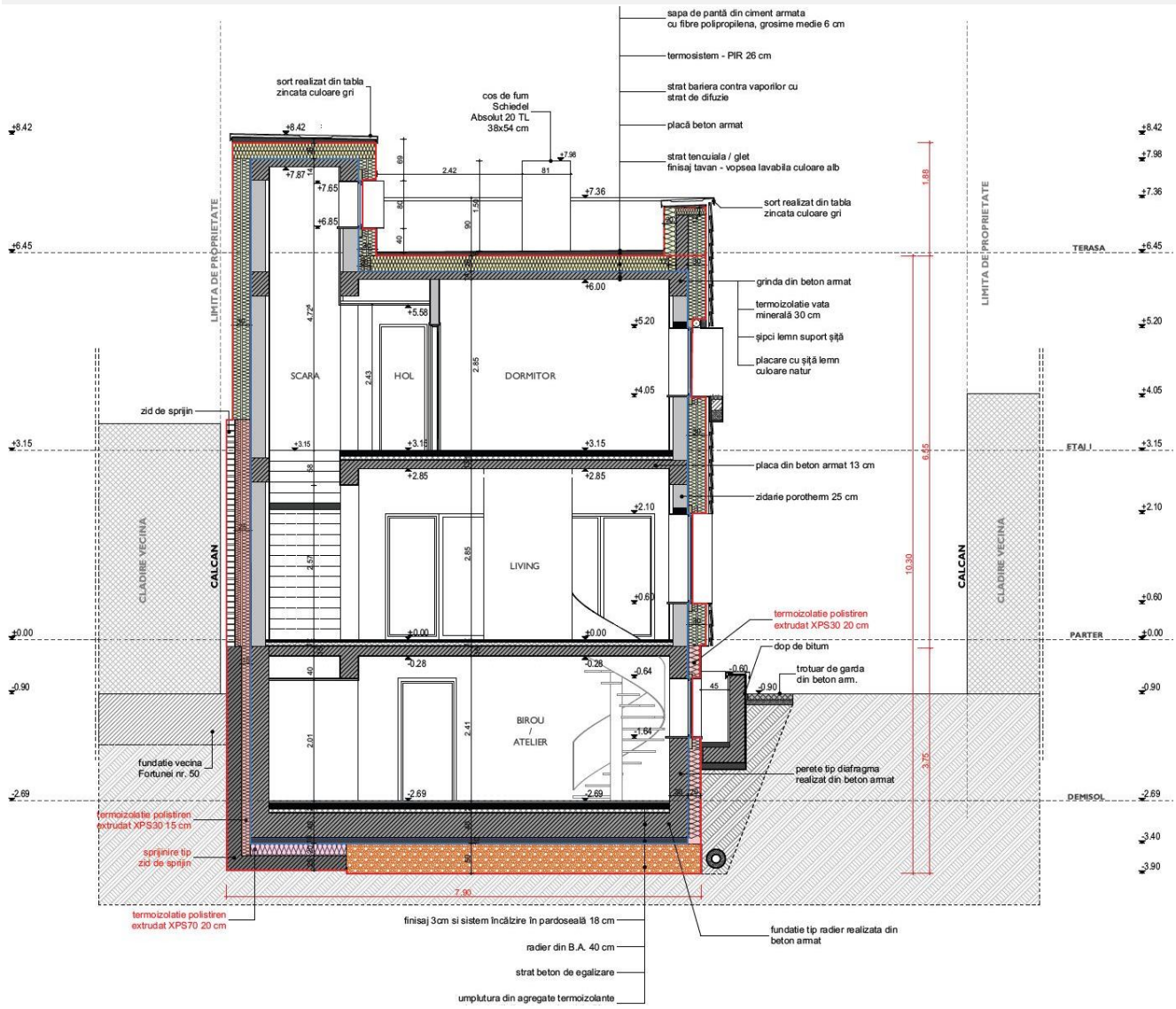
## 1. Ansichtsfotos



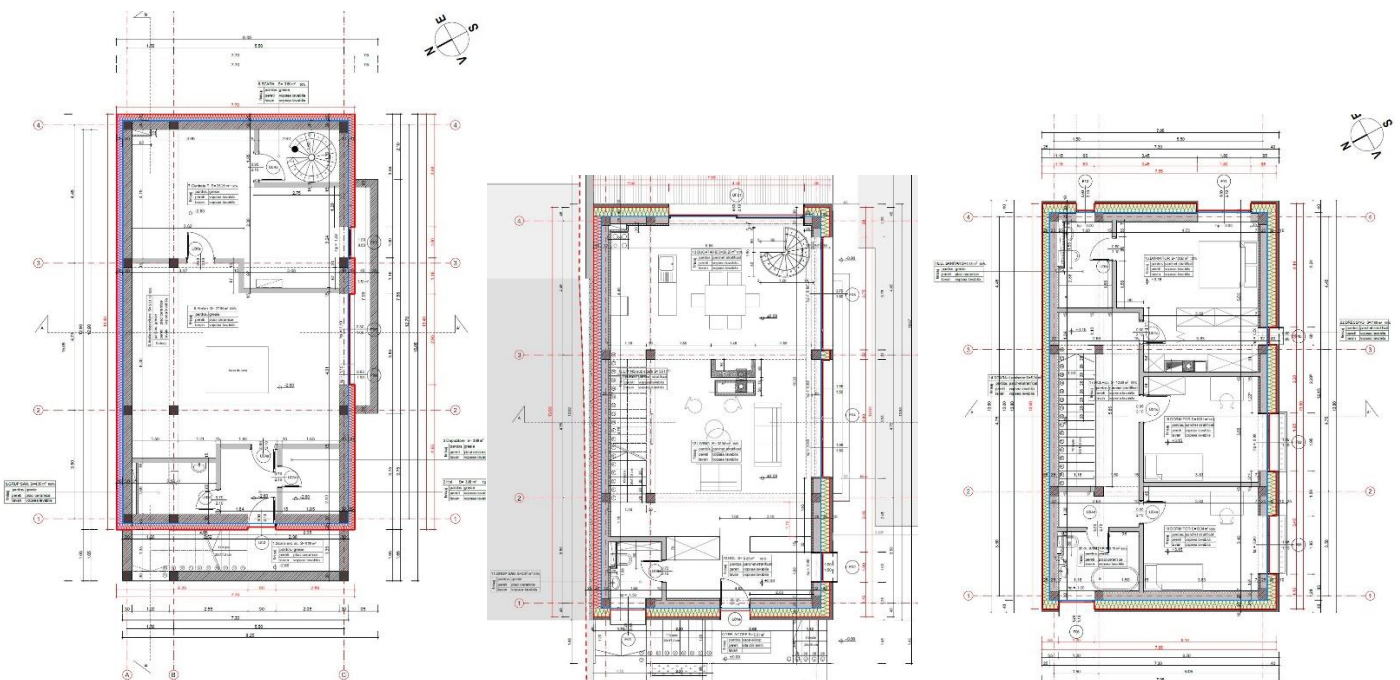
## 2. Innenfoto exemplarisch



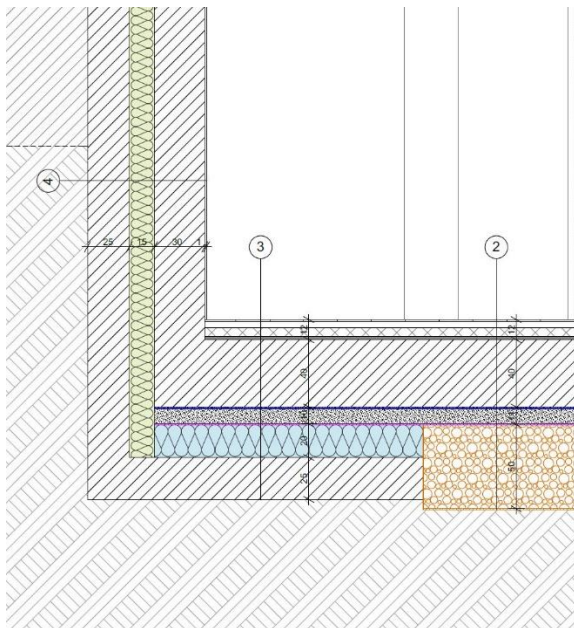
### 3. Schnittzeichnung



### 4. Grundrisse



## 5. Konstruktion der Bodenplatte



- STRAT 4 CALCAN**
- panare
  - sprijinire tip pircin de beton armat
  - termoizolație polistiren extrudat XPS30 15 cm
  - diafragma de beton armat 30 cm
  - tencuială pe baza de ipsos 1 cm
  - glet
  - vopsea lavabila
- STRAT 5 CALCAN**
- zid de sprijin din caramida plina 15cm
  - termoizolație vata minerala Rockwool 25cm
  - adeziv
  - caramida porotherm 25 cm
  - gips-carton + profile metal 6,5 cm
  - glet la rosarii
  - vopsea lavabila

Due to the structural support for the neighboring building, the infrastructure consists of two structural layers and a thermally insulated core.

On the side facing the courtyard, it was sufficient to insulate only with glass foam gravel.

Component nr.	02ud			<b>01_Radier calcan</b>		Izolatie la interior?
Rezistență la transfer termic [m <sup>2</sup> K/W]						
Orientarea elementului de clădire	3-Pardoseala		R <sub>si</sub> (interior)	0.13		
Adiacent la	2-Sol		R <sub>se</sub> (exterior)	0.00		
Aria secțiunii 1	λ [W/(mK)]	Aria secțiunii 2 (optional)	λ [W/(mK)]	Aria secțiunii 3 (optional)	λ [W/(mK)]	Grosime [mm]
Finisaj	0.170					20
Sapa egalizare	1.700					40
XPS incalzire pardoseala	0.038					50
Radier beton armat	2.500					400
Sapa suport armare	2.200					100
XPS70	0.036					200
Zid de sprijin BA	2.500					250
Procentaj sect. 1		Procentaj sect. 2		Procentaj sect. 3		Total
100%						<b>106.0</b> cm
supliment la valoarea-U			Valoare-U: <b>0.134</b> W/(m <sup>2</sup> K)			

Component nr.	Descriere element de clădire		Izolatie la interior?			
01ud	00_Radier					
Rezistență la transfer termic [m <sup>2</sup> K/W]						
Orientarea elementului de clădire	3-Pardoseala	R <sub>si</sub> (interior)	0.13			
Adiacent la	2-Sol	R <sub>se</sub> (exterior)	0.00			
Aria secțiunii 1	λ [W/(mK)]	Aria secțiunii 2 (optional)	λ [W/(mK)]	Aria secțiunii 3 (optional)	λ [W/(mK)]	Grosime [mm]
finisaj	0.170					20
sapa egalizare	1.700					40
XPS incalzire pardoseala	0.038					50
Radier beton armat	2.500					400
Sapa egalizare	2.200					100
Pietris spuma sticla energocell	0.086					500
Procentaj sect. 1		Procentaj sect. 2		Procentaj sect. 3		Total
100%						111.0 cm
supliment la valoarea-U		W/(m <sup>2</sup> K)		Valoare-U:		0.131 W/(m <sup>2</sup> K)

## 6. Konstruktion der Außenwände



The rear wall consists of an outer structural layer, a thermally insulated core, and the wall itself, which is made of concrete or ceramic blocks.

The exterior walls facing the courtyard are made of confined masonry and are insulated with 30 cm of mineral wool. A ventilated shingle-covered façade is mounted over the insulation.





## 7. Konstruktion des Daches

The terrace roof consists of a concrete slab, bituminous vapor barrier, 28 cm of PIR, and TPO membrane for waterproofing.





Component nr.		08ud				07_Terasa		Izolatie la interior?
Orientarea elementului de clădire		1-Acoperiș		Rezistență la transfer termic [m²KW]		R <sub>si</sub> (interior): 0.13		
Adiacent la		1-Aer exterior		R <sub>se</sub> (exterior): 0.04				
Aria secțiunii 1	λ [W/(mK)]	Aria secțiunii 2 (opțional)	λ [W/(mK)]	Aria secțiunii 3 (opțional)	λ [W/(mK)]	Grosime [mm]		
Gipscarton + ST	0.240					150		
Placa beton armat	2.500					130		
Bariera vapori	0.200					2		
PIR	0.022					280		
Membrana FPO	0.700					2		
Procentaj sect. 1		Procentaj sect. 2		Procentaj sect. 3		Total		
100%						56.4 cm		
supliment la valoarea-U:				Valoare-U:		0.074 W/(m²K)		


## 8. Fenster und Fenster-Einbau



<b>Beschreibung der Fenster (rahmen)-Konstruktion, Hersteller</b>	<b>Termoscudo Easy Flat</b>
<b>Fabrikat Fenster (rahmen; Produktname)</b>	Wooden frame with aluminum cladding and PU thermal insulation module
<b>Rahmen-U-Wert <math>U_f</math></b>	0,75 W/(m <sup>2</sup> K)
<b>Bauart der Verglasung</b>	Triple glazing Saint Gobain 442SIXN_4F_6XN_56
<b>Glas-U-Wert <math>U_g</math></b>	0,5 W/(m <sup>2</sup> K)
<b>g-Wert der Verglasung</b>	0,50

## 9. Beschreibung der luftdichten Hülle

The final leak test took place in 2023, with the help of Vlad Ciobanu, ZECAPH.

 FanTestic	version: <b>5.14.90</b>	licensed to: <b>Zecaph Consult srl</b>
Test date: <b>2023-10-26</b>	By: <b>Vlad Ciobanu</b>	
<b>Results</b>		
Air leakage rate at 50 Pa, $q_{50}$ , [m <sup>3</sup> /h]	<b>233.95</b>	
Air changes at 50 Pa, $n_{50}$ , Pa [1/h]	<b>0.37</b>	
Air leakage rate at 10 Pa, $q_{10}$ , [m <sup>3</sup> /h]	<b>61.865</b>	
Specific leakage rate (envelope) at 50 Pa, $q_{E50}$ , [m <sup>3</sup> /h/m <sup>2</sup> ]	<b>0.3771</b>	
Specific leakage rate (floor) at 50 Pa, $q_{F50}$ , [m <sup>3</sup> /h/m <sup>2</sup> ]	<b>1.008</b>	
Effective leakage area at 10 Pa, $ELA_{10}$ , [cm <sup>2</sup> ]	<b>42.16</b>	
Specific effective leakage area (envelope) at 10 Pa, $ELA_{E10}$ , [cm <sup>2</sup> /m <sup>2</sup> ]	<b>0.067975</b>	
Specific effective leakage area (floor) at 10 Pa, $ELA_{F10}$ , [cm <sup>2</sup> /m <sup>2</sup> ]	<b>0.182</b>	
Equivalent leakage area at 10 Pa (EqLA), [cm <sup>2</sup> ]	69.12	

### Air tightness concepts:

Walls: Interior and exterior plastering

Floor slab: Concrete

Window connection: window sealing tapes

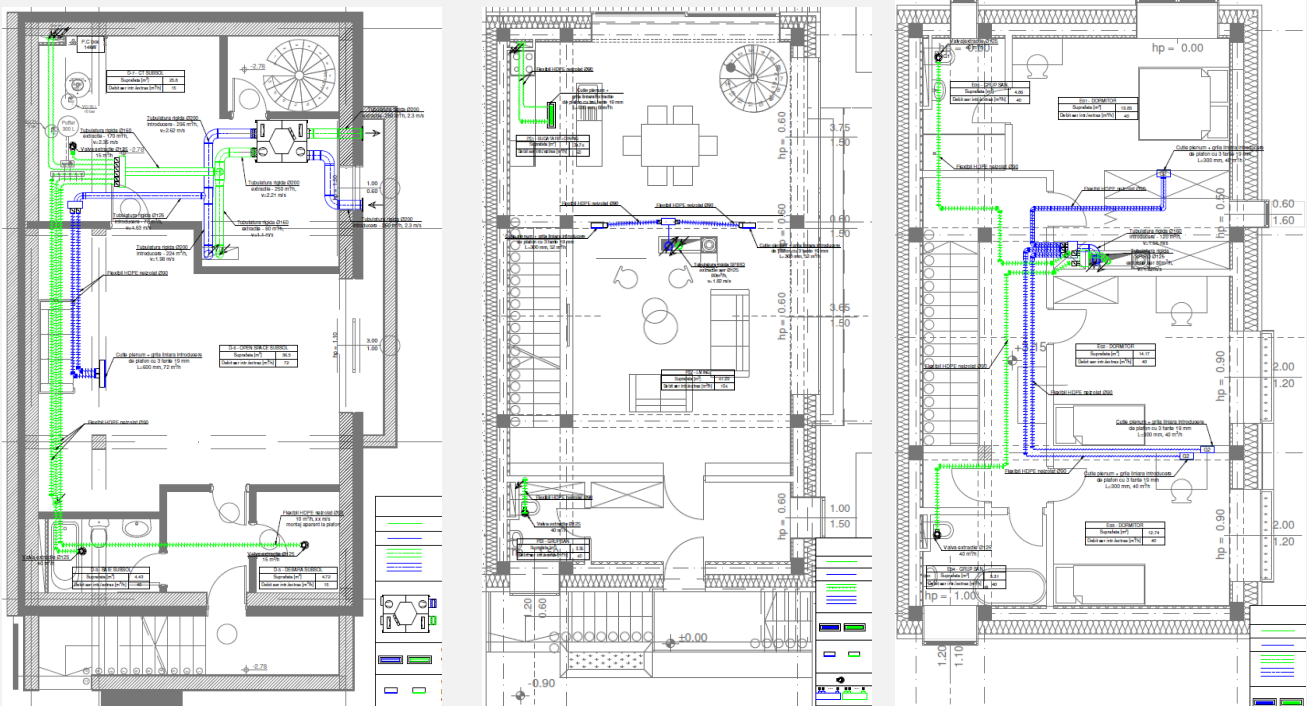
Roof: concrete slab and vapour barrier membrane

## 10. Lüftungsgerät

Fresh air is supplied by a Dantherm HCH 8 ventilation system with a heat recovery rate of 83%.



## 11. Lüftungsplanung Kanalnetz



The supply air rooms are all the main living areas (ducts marked in blue): the living room, study, dining room, children's room, and bedroom.

Exhaust air rooms are the bathrooms, toilets, and kitchen (ducts marked in green).

Overflow occurs through ceiling grilles and interior door grilles, moving up the stairwell.

The stale air is returned to the heat exchanger in the basement and then expelled through the exhaust ducts in the courtyard.

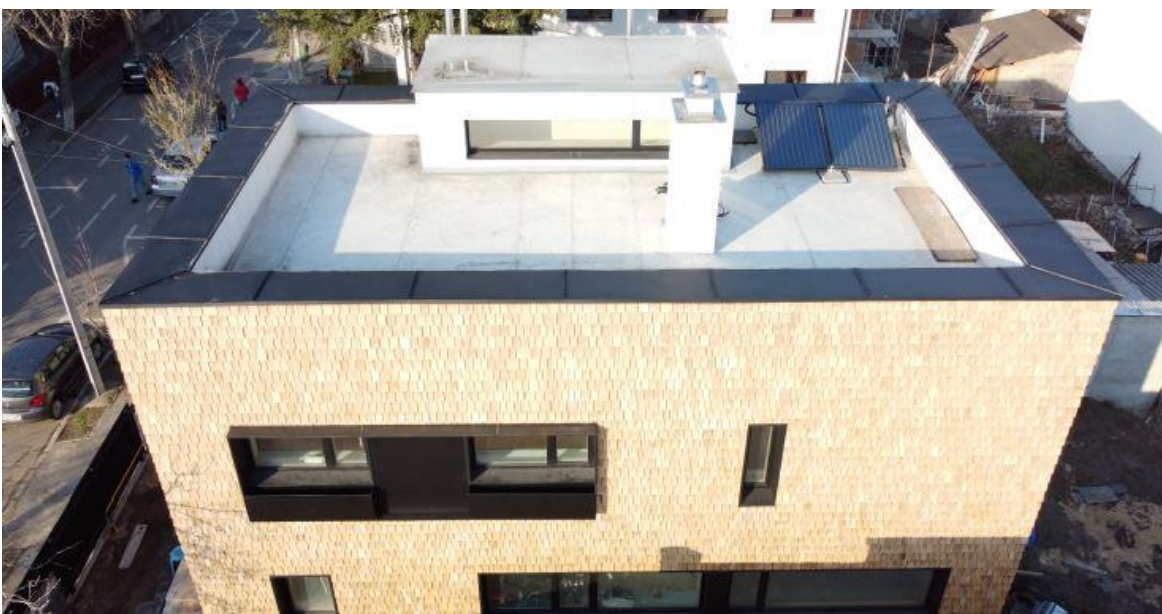
## 12. Wärmeversorgung



The heating system consists of underfloor heating, which is supplied with thermal agent from an air-water heat pump.

In addition to it, the owners requested a fireplace. To avoid overheating, we've chosen a model that is a certified PHI Component.

The heat pump and the two solar panels mounted on the terrace roof provide domestic hot water.



## 13. Baukosten

The construction cost, including interior finishes, came to €1,820 per usable square meter.

## 14. Extras

My office took care to document this project. A total of 5 videos are available on Youtube.

- [What does a 1:1 discussion on technical details look like](#) – preliminary discussion on design solutions and technical details in design
- [Tour of a PASSIVE HOUSE WITH EVERYTHING!](#) Challenges and costs – discussion applied to the construction site, with video presentation of many of the details from the construction site
- [What is it like to be your own PROJECT MANAGER?](#) Tour of the PASSIVE HOUSE construction site – advice on construction site costs-
- [FIREPLACE in a PASSIVE HOUSE!](#) Installation on site, operation, costs. – video presentation of the stove's construction
- [HOW to ADJUST THE VENTILATION SYSTEM](#) and balance the air flow – video documentation adjusting ventilation flows and balancing the air flow of the ventilation system

## 15. PHPP-Ergebnisse

### Casa Pasivă - Verificare



Arhitectură:	Birou proiectare metropolitana srl			Clădire:	Casa Baltagi		
Strada:	Pălăniș, nr. 18			Strada:	Fortunei, nr 56		
Cod poștal/Localitate:	200127	Craiova		Cod poștal/Localitate:	12877	București	
Provincia/Țara:	Dolj	RO-România		Provincia/Țara:	Ro-Romania	RO-România	
Tip de clădire:	Clădire locuință unifamilială S+P+E			Set de date climatice:	ud-02-RO0004a-Bucharest		
Consultanță energetică:	Inginerie Cretivă Birou de Proiectare SRL			Zonă climatică:	4: Temperată caldă	Altitudine:	90 m
Strada:	Constantin Caraaș nr 4			Proprietar / Client:	Baltagi Vlad și Florina		
Cod poștal/Localitate:	11154	București		Strada:	Fortunei, nr 56		
Provincia/Țara:	București	RO-România		Cod poștal/Localitate:	12877	București	
Anul de construcție:	2023	Temperatură interioară de iarnă [°C]:		20.0	Temp. Int. de vară [°C]:	25.0	
Nr. de unități de locuit:	1	Aporturi interne de căldură (IHG) pentru încălzire [W/m²]:		2.3	IHG caz răcire [W/m²]:	3.1	
Nr. de ocupanți:	3.1	Masivitate termică [Wh/K pe m² TFA]:		204	Răcire artificială:	x	
Inginer instalații:	Zal Investments &co SA			Certificare:			
Strada:	Aleea Nehoiu 2.12			Strada:			
Cod poștal/Localitate:	42185	București		Cod poștal/Localitate:			
Provincia/Țara:	Sector 4	RO-România		Provincia/Țara:		RO-România	

Caracteristici specifice clădirii raportate la aria de referință a pardoselii						
Criterii	Criterii alternative	Îndeplinit? <sup>2</sup>	Criterii			
			15	-	15	10
Încălzire spații	Aria utilă a pardoselii m <sup>2</sup>	226.1				
	Necesar de căldură încălzire kWh/(m <sup>2</sup> a)	14	≤	15	-	da
Răcire spații	Sarcina termică W/m <sup>2</sup>	11	≤	-	10	da
	Nec. răcire & dezumid. kWh/(m <sup>2</sup> a)	5	≤	15	15	da
	Sarcină de răcire W/m <sup>2</sup>	9	≤	-	10	da
	Frecvența perioadei de supraîncălzire (> 25 °C) %	-	≤	-	-	-
Frecvența per. cu umiditate excesiv de mare (> 12 g/kg) %	0	≤	10	-	da	
Etașeitate la aer	Rezultat test la presiune n <sub>50</sub> 1/h	0.3	≤	0.6	-	da
Energie Primară Neregenerabilă (PE)	Consum PE kWh/(m <sup>2</sup> a)	71	≤	-	-	-
Energie primară regenerabilă (PER)	Necesar PER kWh/(m <sup>2</sup> a)	57	≤	60	60	da
	Produce de energie regenerabilă (raportată la aria amprentei la sol a clădirii) kWh/(m <sup>2</sup> a)	5	≥	-	-	da

<sup>4</sup> Câmp gol: Lipsă date; <sup>2</sup>: Nici o cerință

Confirm că aceste valori furnizate aici au fost determinate urmând metodologia PHPP și sunt bazate pe valorile caracteristice ale clădirii. Calculele PHPP sunt atașate acestei verificări.

Casă Pasivă Classic? **da**