Project Documentation
Gebäude-Dokumentation

1 Abstract / Zusammenfassung

Detached single family house in Budapest, Hungary

1.1 Data of building / Gebäudedaten

Year of construction/ Baujahr	2016	**Space heating / Heizwärmebedarf**	**15 kWh/(m²a)**
U-value external wall/ U-Wert Außenwand	0.112 W/(m²K)		
U-value basement ceiling/ U-Wert Kellerdecke	0.113 W/(m²K)	**Primary Energy Renewable (PER) / Erneuerbare Primärenergie (PER)**	51 kWh/(m²a)
U-value roof/ U-Wert Dach	0.082 W/(m²K)	**Generation of renewable energy / Erzeugung erneuerb. Energie**	115 kWh/(m²a)
U-value window/ U-Wert Fenster	0.83 W/(m²K)	**Non-renewable Primary Energy (PE) / Nicht erneuerbare Primärenergie (PE)**	69 kWh/(m²a)
Heat recovery/ Wärmerückgewinnung	88 %	Pressure test n_{50} / Drucktest n_{50}	0.4 h-1
Special features/ Besonderheiten	Using recycled insulation (foam glass gravel), ground heat for free-cooling, photovoltaic system, shower water heat recovery, greenroof		

1.2 Brief Description ...

Detached single family house in Budapest, Hungary

This narrow residence is located in a mix of nice natural and urban surroundings area at Budapest, Hungary. Features efficient use of space for a family of 4. It offers three set of rooms on the top level, an open space living area in the middle and storages and an out of the thermal shell garage on the basement.

Kurzbeschreibung der Bauaufgabe

Detached single family house in Budapest, Hungary

1.3 Responsible project participants / Verantwortliche Projektbeteiligte

Architect/ Entwurfsverfasser	Attila Hegedűs, http://holnaphaz.hu/
Implementation planning/ Ausführungsplanung	Attila Hegedűs http://holnaphaz.hu/
Building systems/ Haustechnik	István Zámbor http://hlk.hu/
Structural engineering/ Baustatik	Eöttevényi Tamás
Building physics/ Bauphysik	Attila Hegedűs http://holnaphaz.hu/
Passive House project planning/ Passivhaus-Projektierung	Attila Hegedűs http://holnaphaz.hu/
Construction management/ Bauleitung	

Certifying body/ Zertifizierungsstelle	Passive House Institute Darmstadt www.passiv.de	
Certification ID/ Zertifizierungs ID	Project-ID (www.passivehouse-database.org) Projekt-ID (www.passivehouse-database .org)	5033

Author of project documentation / Verfasser der Gebäude-Dokumentation	Dipl.-Ing. Enikö Sariri-Baffia, Energie Planer Team http://www.passivhaus-info.eu/
Date, Signature/ Datum, Unterschrift	06.19.2018

2 Views of the building

Viewing from the east side. The ramp going to the garage can be seen.

The south-west angle of the building with the terrace, and west facing balcony on the upper story.

The south-facing side of the house with, different sized large windows.
(The south-facing side shown in the cover page.)

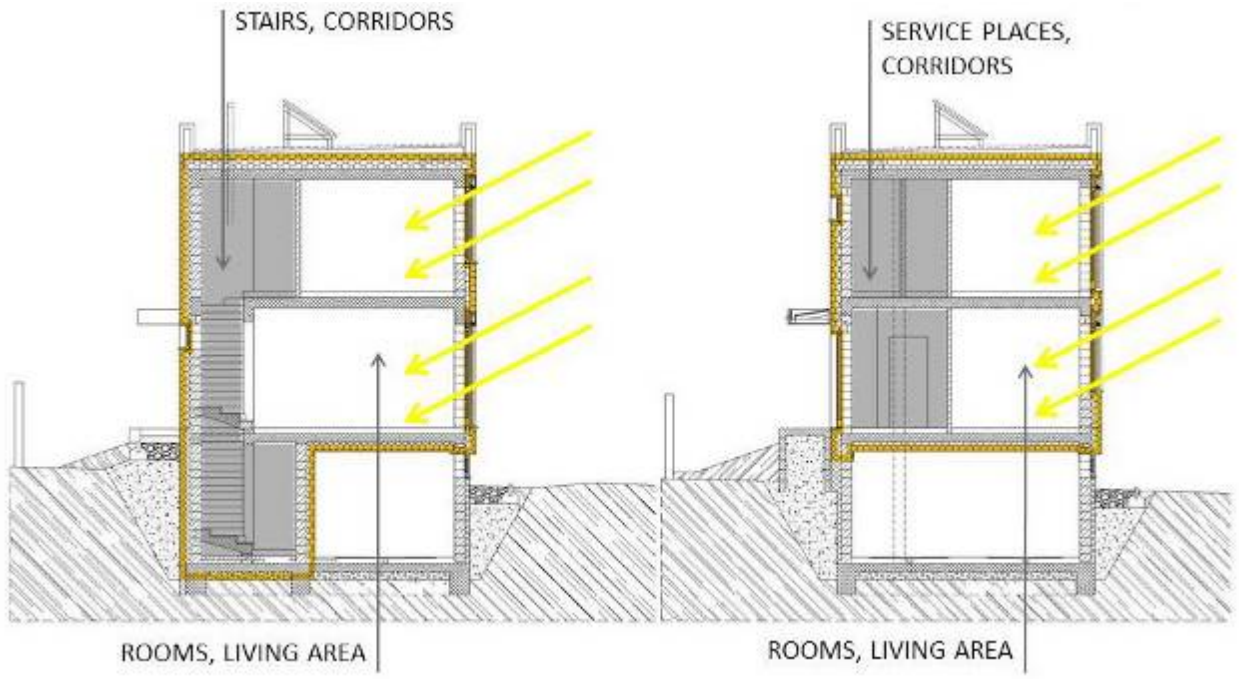
Viewing from the garden (west side).

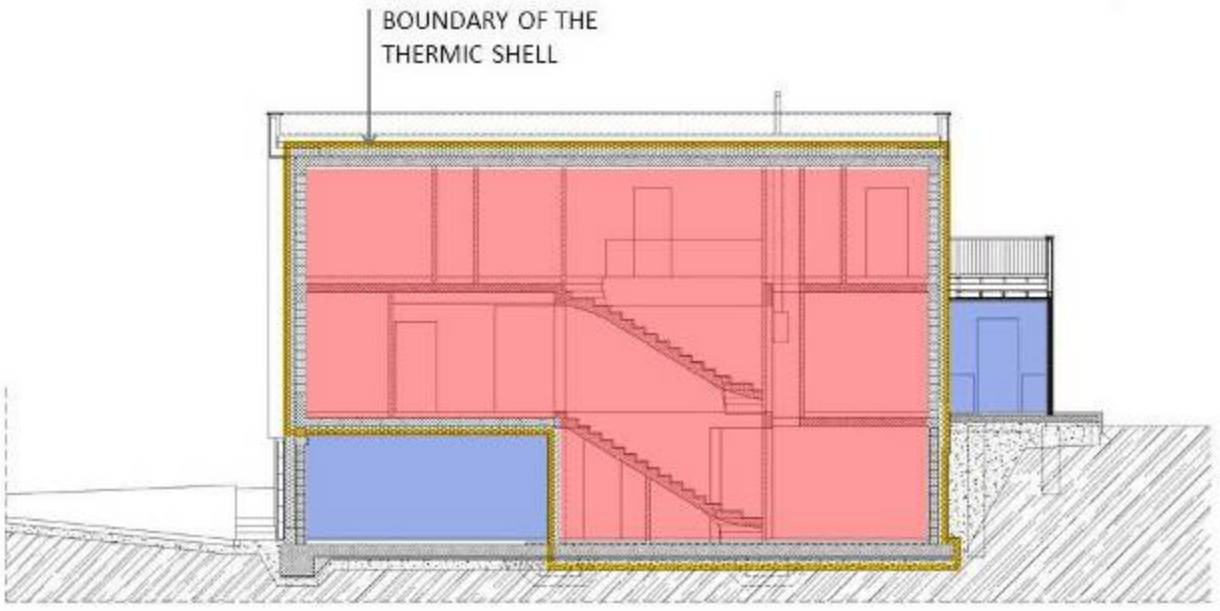
Visualized model photos

2.1 From the inside of the building

Interior views of the living and dining area. The light comes directly from the south-facing glazed area.

3 Sectional drawings of the building



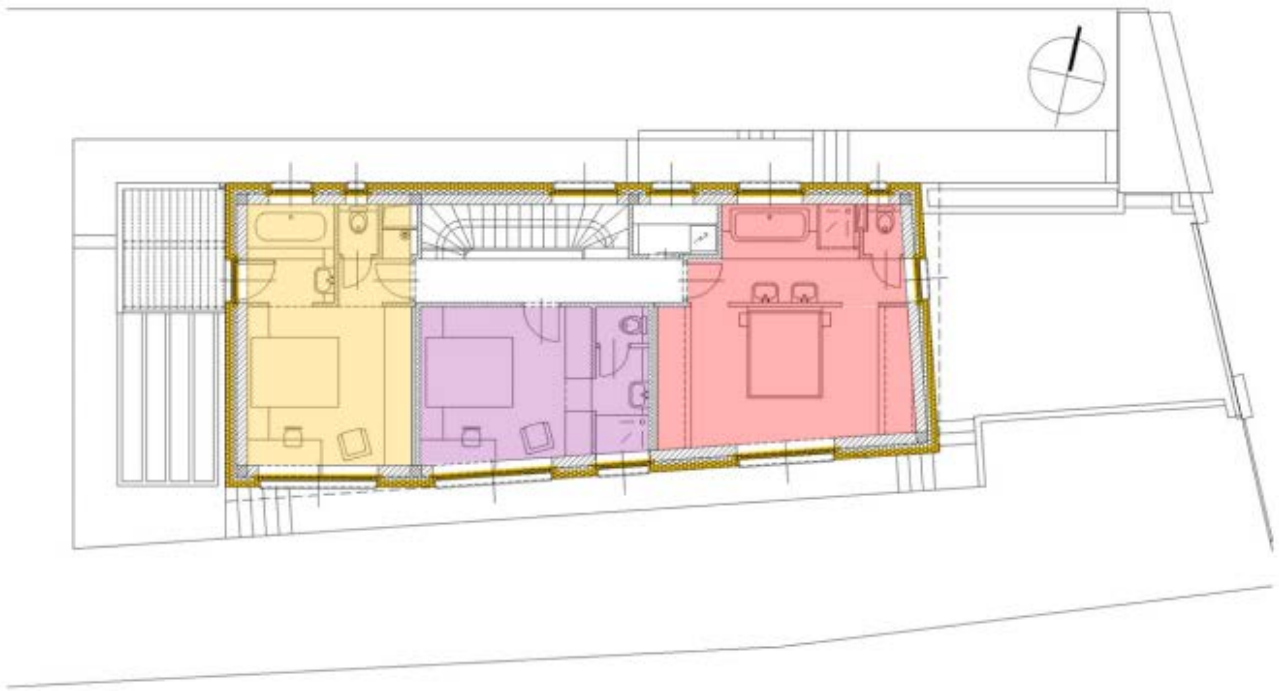


4 Building location and the floor plans

Building installation gives good possibility for the passive use of sun heat.

Basement floor plan with functions inside and outside the thermic shell.

Ground floor plan
The service places (storage, stair, lobby, rest room) are colored.

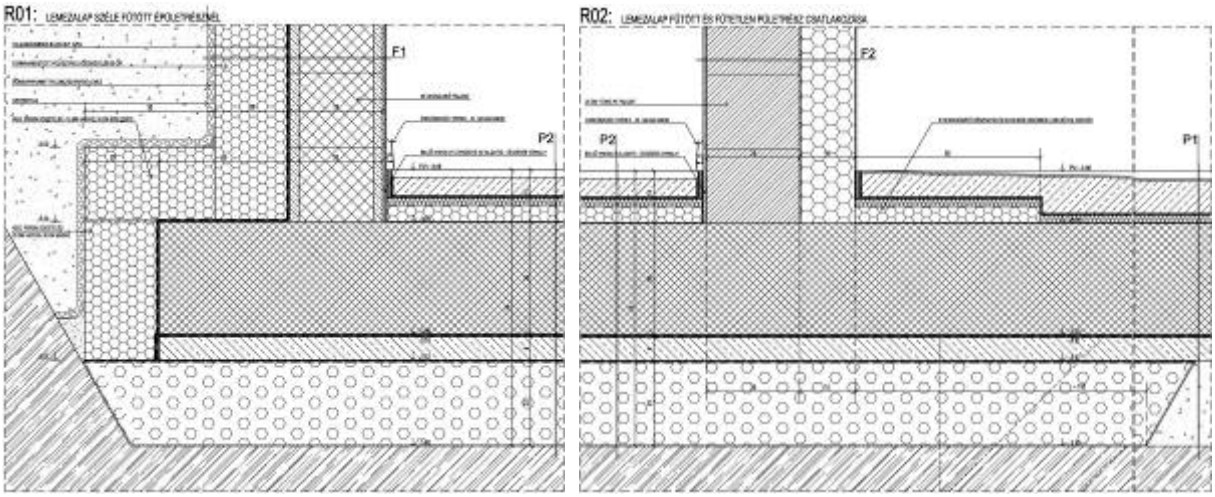


First floor plan
Three separate apartment for the different generations.

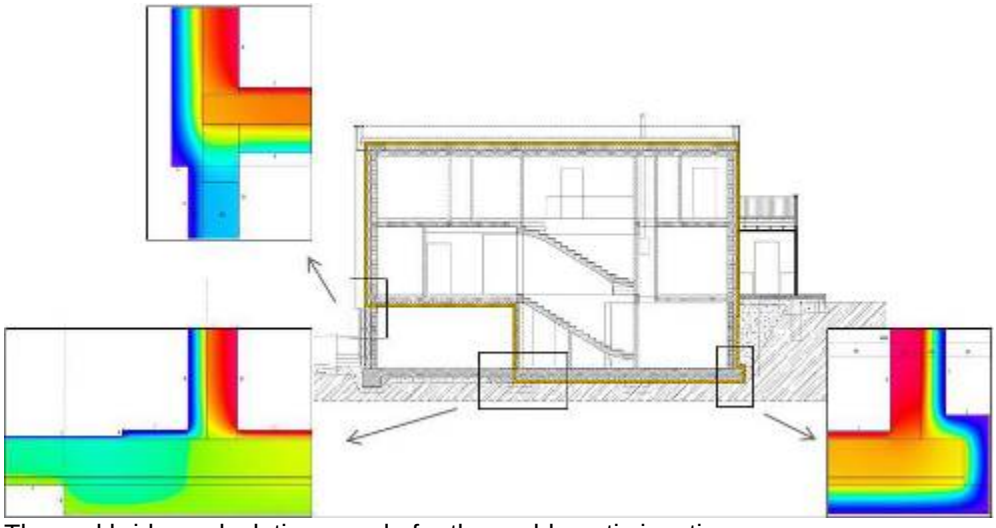
5 Construction details of the building shell

5.1 Construction of the floor slab


Foamglass gravel (25 cm) under the floor slab - We used GEOCELL® whitch is a highly heat-insulating, ecological alternative for insulation to building floors from 99% recycled glass.



Detail drawing – connection between floor slab and basement wall solation.



Thermal bridge calculations made for the problematic junctions.

5.2 Construction of the exterior walls

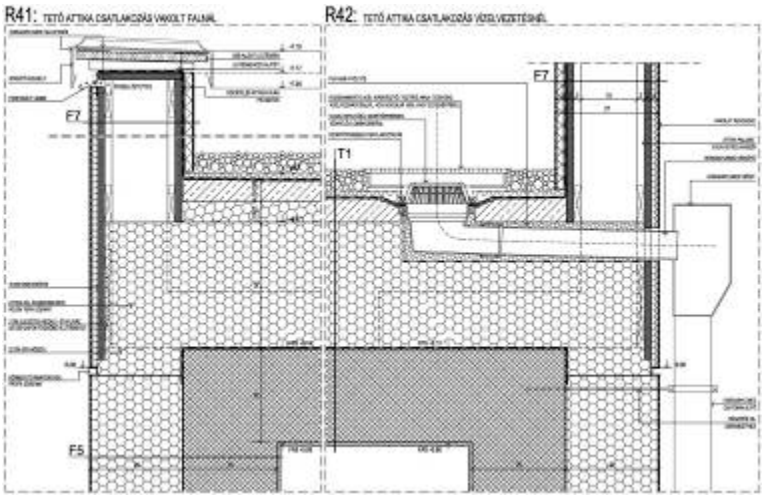

Isolation under ground
(Reinforced concrete wall with Expert EPS isolation - thickness is various 15, 25 cm)

Constructing the exterior walls
(The exterior walls made of autoclaved concrete elements (Ytong) with reinforced concrete pillars and 25 cm external EPS isolation)

Constructing the basement interior wall between the heated zone and the garage
(Ytong walls with 15 cm externap graphitic EPS isolation

5.3 Construction of the roof


Construct of the roof attic, and isolating the roof slab
(Reinforced concrete slab, vapor barrier foil, isolation, concrete slope, waterproofing, green roof)

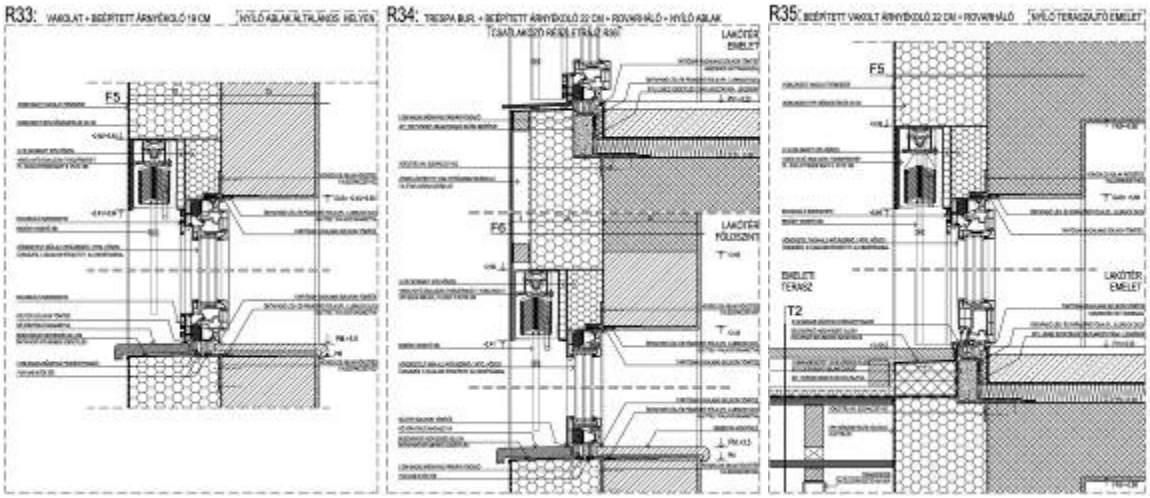


Construct of the roof attic, and isolating the roof slab on detail drawing

Making the ground for green-roof

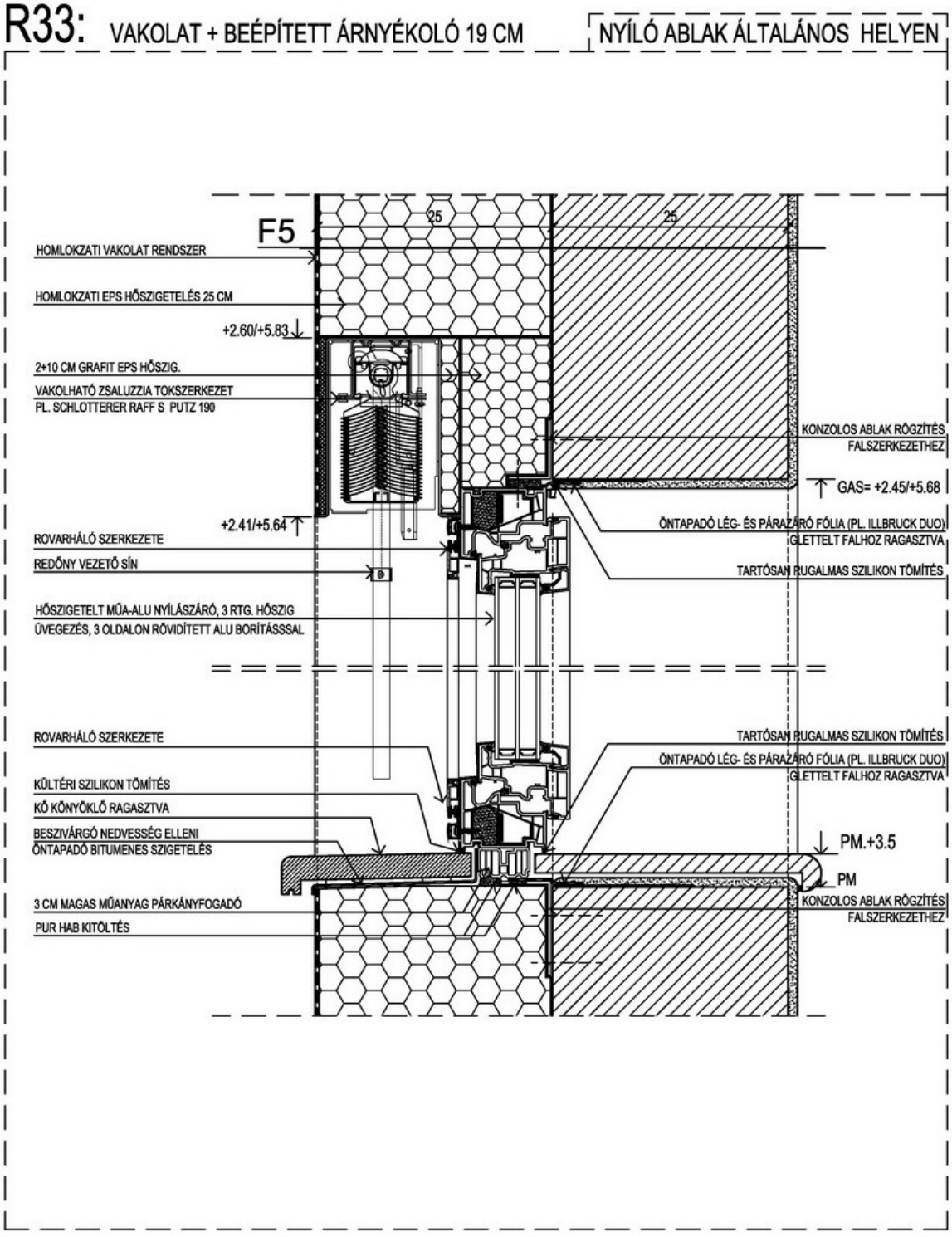
5.4 Windows, doors


Doors and windows build up (Both external doors and windows made of Internorm KF410 frames, using both 'light' and 'solar+' glass constructions),
Windows: Uf 0.96 W/(m^2K)
Glass constructions: - solar+ Ug 0.60-0.69 W/(m^2K), g 60-62%;
- light Ug 0.50 W/(m^2K), g 50%
Entrance doors: U d-value = 0.79 W/(m^2K)



Windows and shade build up on detail drawings


Raffstore build up



Deatil of general windows and raffstore implementation

6 Airtight building envelope

Airtight structures:
Concrete slabs, internal mortar, airtight foils around windows and doors

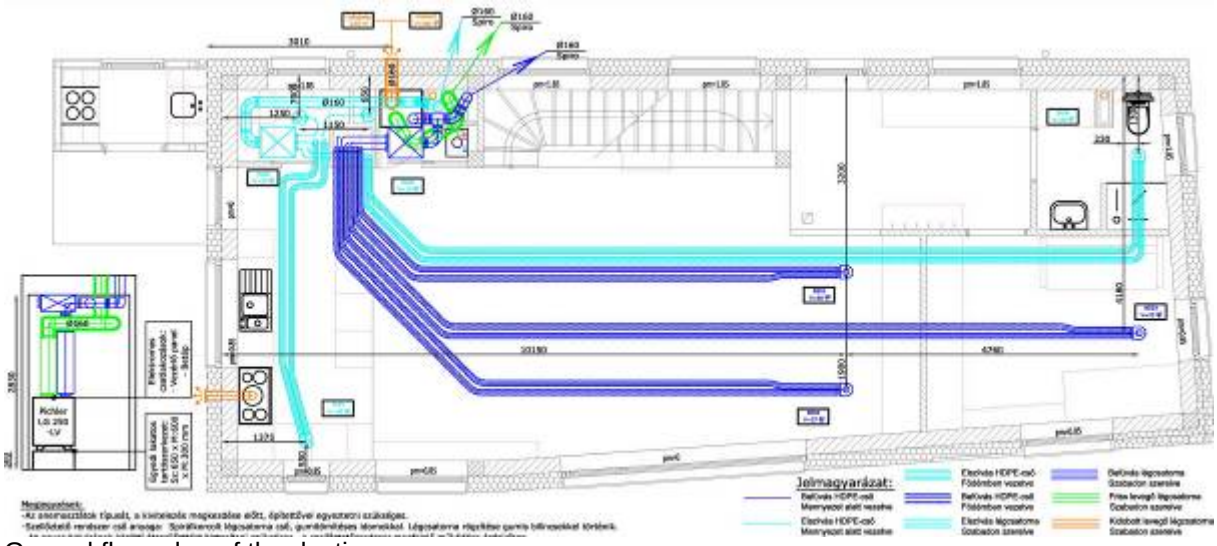
Making airtight joint between concrete slab and glass structure using bituminoun foil.

Internal smoothing made behind inbuilt technical equipment

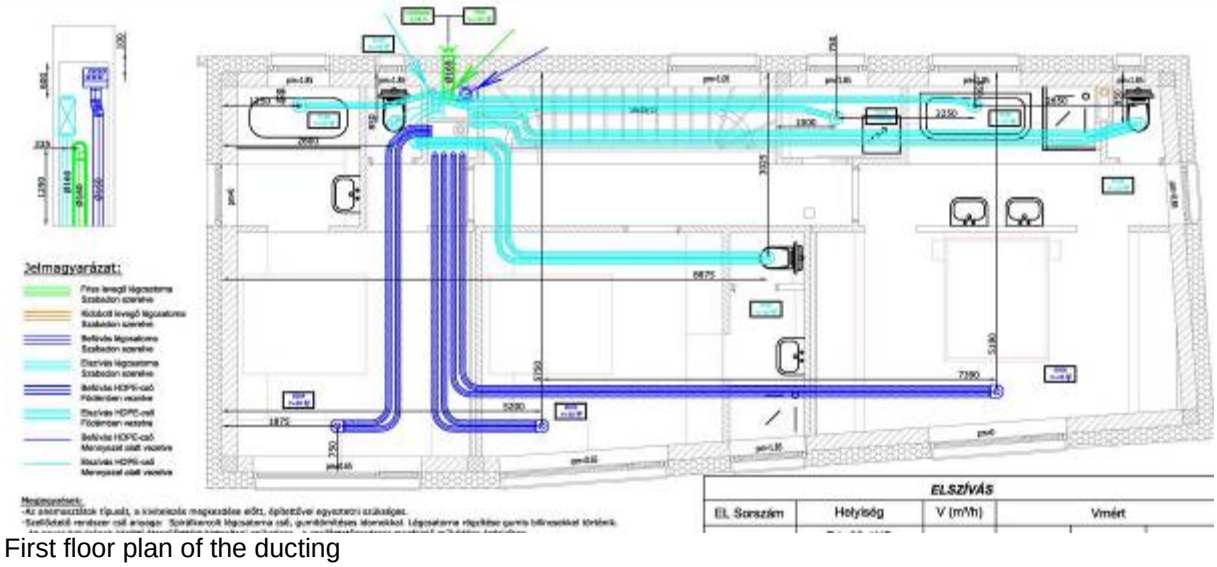
The pressure test (n50 value) resulted 0.41 h^{-1}.
(partial result for overpressure 0,44 h^{-1}, negative pressure 0,38 h^{-1})

7.1 Ventilation system ducting

Ventilation ducts installed in concrete slab.



Ground floor plan of the ducting



First floor plan of the ducting

7.2 Central ventilation unit,

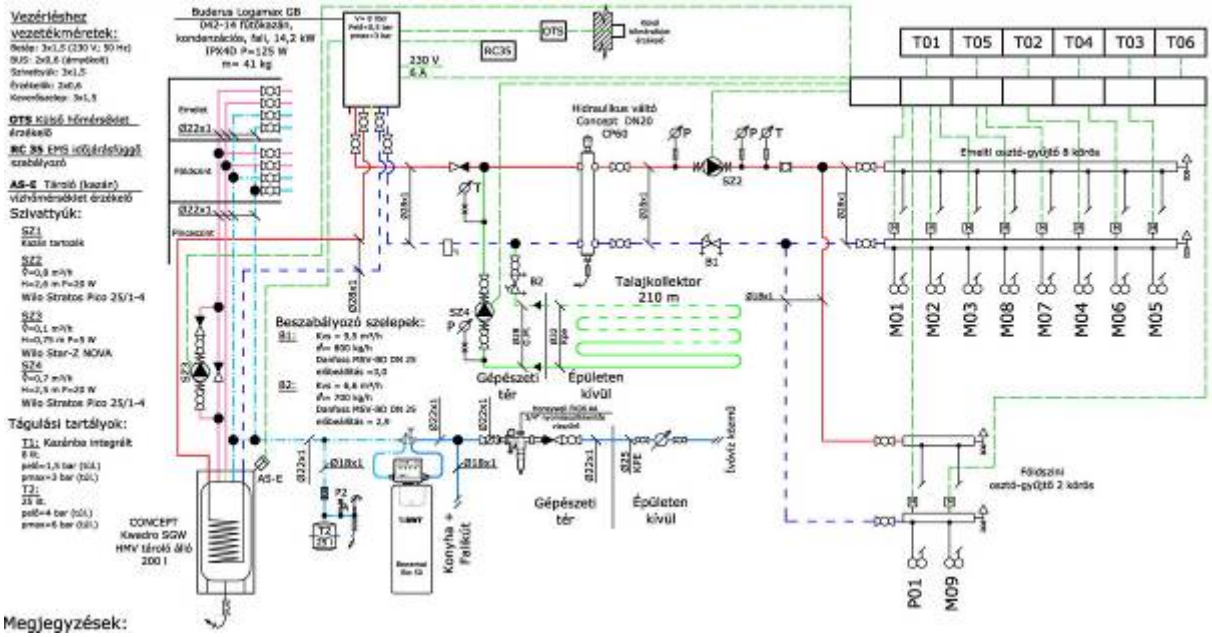
Pichler, LG 250
air handling unit with heat recovery, specif. heat recovery efficiency = 88%
Electrical efficiency 0.30 Wh/m³
(the gas boiler - Buderus Logamax - can be seen on the right)

8 Heat supply

Main heat supplier is a gas boiler (Buderus Logamax)

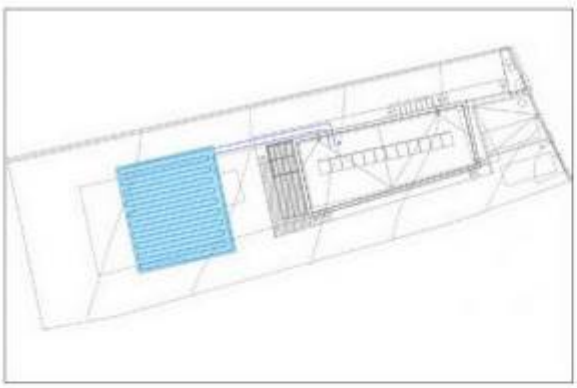
The pipes for the ceiling heating (and cooling) were built into the concrete slab:

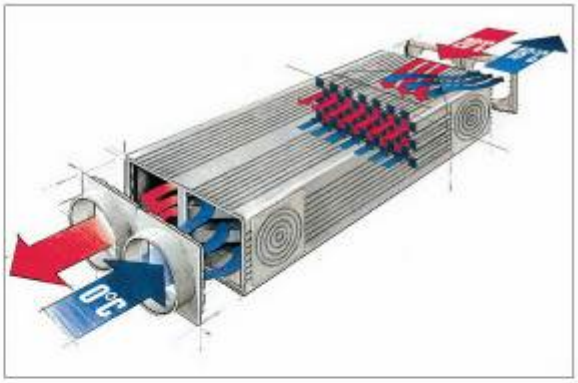
Switching drawing of the heating system :

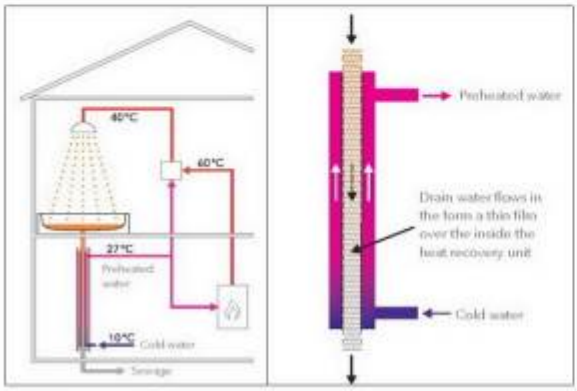


8.1 Oder information about the building services

Building technology with renewable energy used







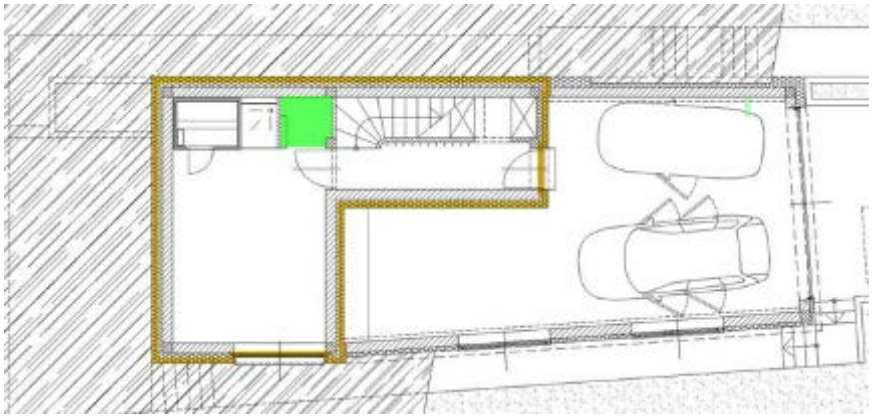
The house has a **passive cooler** system which uses the cool-energy from a ground collector.

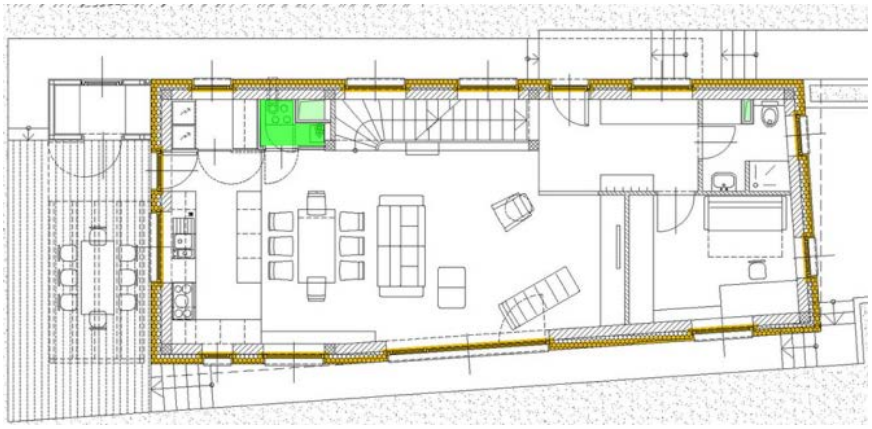
Beside the **heat recovery** used in the ventilation system (Pichel LG250) we use another to save the heat energy used of the **shower**. The ECOshower 15 pipe built in the wastewater system has a 63% heat recovery efficiency.

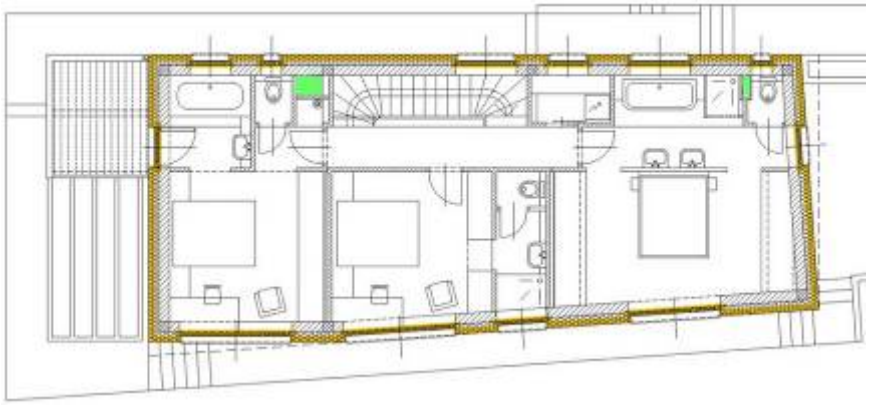
The top of the building is built like **green-roof**. It helps to prevent the overheating of the house, as well a **photo voltaic system** (4 kW peak power for now, it can be expand to 6.4 kWp) is installed on it.

8.2

Space saving building-technology design and installation:







It was a main planning issue to minimalize the floor place need of the building technology. For this the equipment took place in two levels, near the uptake pipes.

9 PHPP results

Passzívház Igazolás

Épület:	Sasadi családi ház		
Utca és házszám:	Rákó utca 75		
Irsz. / Város	H-1112 Budapest		
Ország:	Magyarország		
Épület típus:	családi ház		
Klíma:	[HU] - Budapest passipedia.org	Tengerszint feletti magasság:	150
Építtető:	Hegedüs Attila és Hegedüsné Szücs Márta		
Utca és házszám:	Rákó utca 75		
Irsz. / Város	H-1112 Budapest		
Tervező:	Hegedüs Attila a.hegedus@yahoo.com	+36 30 9929881	
Utca és házszám:	Várhegyi u. 6		
Irsz. / Város	H-2071 Páty		
Épületgépészet:	Zámbor István zambor.istvan@hlk.hu	+36 30 5497929	
Utca és házszám:	HLK Kft. - Kossuth Lajos u. 9.		
Irsz. / Város	H-8799 Pakod		

Építés éve:	2015		Téli belső léghőmérséklet:	20,0	°C	Beépített Térfogat, V_e m³: 1059,8
Lakóegységek száma:	1		Nyári belső léghőmérséklet:	25,0	°C	Gépi hűtés: x
Személyek száma:	5,1		Belső hőforrások, TÉL... :	2,1	W/m²	
Hőkapacitás:	180	Wh/K per m² TFA	... és NYÁR:	2,8	W/m²	

Vizsgált épület fajlagos energiamérleg-adatai:

				A követelmény	Teljesült ?*
	Energiavonatkoztatási felület:	179,3	m²		
Fűtés	Fajlagos fűtési energiaigény:	15	kWh/(m²a)	15 kWh/(m²a)	igen
	Csúcshőveszteség (fajlagos):	13	W/m²	10 W/m²	-
Szabad Hűtés	Hűtési energiaigény összesen:	2	kWh/(m²a)	15 kWh/(m²a)	igen
	Hőterhelés (fajlagos):	10	W/m²	-	-
	Túlmelegedés gyakorisága (> 25 °C)		%	-	-
Primerenergia	Fűtés, hűtés, segédenergia, Páratlanítás, HMV, világítás, elektr.be:	97	kWh/(m²a)	120 kWh/(m²a)	igen
	HMV, fűtés és segédenergia:	55	kWh/(m²a)	-	-
	PE-kiváltása fotovoltaikus napelemekkel:	115	kWh/(m²a)	-	-
Légzárás	Légtömörség mérés, n_{50}	0,43	1/h	0,6 1/h	igen

* üresen hagyott mezők "-" nem követelmény

Passzívház ? igen

Biztosítjuk, hogy az itt megadott értékek a PHPP eljárás szerint az épület jellemzői alapján kerültek meghatározásra. A PHPP számítás a MINŐSÍTÉS mellékletét képezi.

Vezetéknév:	Enikö
Keresztnév:	Esariri-Baffia
Cég / Vállalkozás:	Energie Planer Team
PHPP regisztrációs szám:	PHDE_040515_287017161_de09
Kiállítás dátuma:	26.10.2016
Aláírás:	

Energie Planer Team
Dipl.-Ing. Enikö Sariri-Baffia
Ringstraße 26
64342 Seeheim-Jugenheim
Tel. 061 51 / 39 65 78 7

10 Construction Cost

(building owner does not wish to display these information)

Year of construction

2015-2016

holnaphaz.hu

Attila Hegedűs
architect