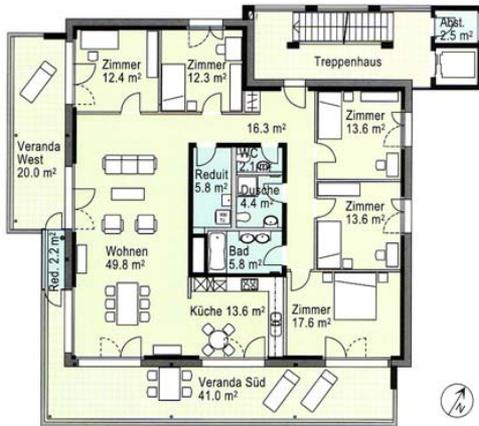


Konstanz  
Rothenburg, Switzerland





Standard floor plan  
(Ground floor, 1<sup>st</sup> floor, 2<sup>nd</sup> floor)

6 ½ rooms: 167.3 m<sup>2</sup> net living area  
Veranda: 61.0 m<sup>2</sup>



Living room

## The project

The Konstanz project was built by Anliker AG in 2002 / 2004. From the thirteen apartment buildings seven are built to the Passivhaus standard. The housing estate is situated in the suburbs of Lucern, a few minutes away from the city center.

The building site is well tied into Rothenburg's utilities infrastructure. It is surrounded by a green belt of natural spaces which offers a high living quality. The plan is based on the historic "Garden City" concept. The generous separation between buildings affords good daylighting and natural ventilation for each apartment. The outdoor spaces are restricted to pedestrian and bicycle traffic.

A very flexible floor plan can be easily adapted to fulfil the individual buyer's needs. The living area of around 170 m<sup>2</sup> can be used as 6 ½ rooms, 5 ½ rooms, a loft or be divided into two apartments of 4 ½ rooms and 2 ½ rooms.

## Objectives

The aim of the project is to provide affordable, ecological housing with a minimum of energy requirement. To achieve this, a conventional structural system was modified to include all the features of a passive house.

"Why build energy efficient housing when you can't sell it because the units are too expensive or architecturally unattractive?" The response was to design a conventional building where energy features are unobtrusive.

The goal was to provide living space with good architecture. Spacious and bright rooms are created which are easily marketed.

## Marketing strategy

The housing estate is promoted in a brochure using the slogan "Rothenburg Konstanz c'est la vie" Living in Rothenburg Konstanz - that's life! A large photo of a happy young girl, playing on a swing in a summer meadow is the logo of the campaign addressing young families. This promotional material emphasizes that the buildings are very ecological providing a healthy place to live.

Anliker AG selected the target group amongst young families as the ones who were "forward thinking". When developing the marketing- and communication plan, however, other factors than environment were emphasized.

The project was wrapped in: good architecture, trendy design, way of living, family values, happy and healthy children, a lot of green spaces, health focus and being responsible for the next generation.

Using trend issues both in developing the apartment concepts and later communicating with the customers Anliker AG achieved an extra promotion/marketing effect in the market for their product – several forces stimulated the market niche and finally resulted in good sales for the company.

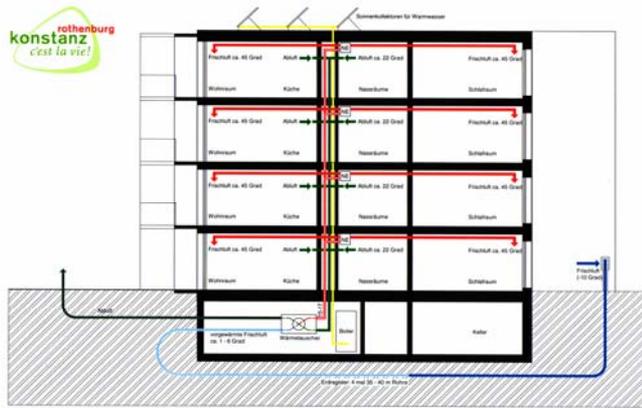
The units have been awarded the "Passivhaus Certificate" the Swiss "Minergie-P Certificate" and the "Swiss Building Award". These awards gave Anliker AG a lot of publicity in the newspapers winning both the company and the product extra attention in the market.



Solar collectors



Special (Hilti) construction from wall to wall without penetration of insulation



Technical system

### Building construction

The bearing wall construction consists of masonry and reinforced concrete.

#### Roof

Plaster, concrete, vapor barrier, insulation (36 cm) with aluminium backing, water-tight barrier, protective felt, extensive green roof.

#### Walls

The walls are built with clay masonry units, exterior insulation (28cm mineral wool), and a back-vented wooden skin (S-W façade) or exterior insulation (30cm Neopor), with plaster(N-E facade).

#### Windows

The windows are triple glazed.

#### Floor to cellar

Floor covering, levelling cement grout, PE foil, polystyrene insulation (3 cm), acoustical insulation, concrete, polystyrene insulation (30 cm).

#### U-Values

Walls	0.104 - 0.129 kWh/m2a
Floor	0.089 kWh/m2a
Roof	0.076 kWh/m2a
Window	0.72 – 0.78 kWh/m2a
g-Value	0.43 %

### Technical systems

The Konstanz project was optimized for passive solar energy use. The highly insulated and very tight building envelope has no thermal bridges. The building uses around 10% of the energy of a conventionally built house in Switzerland.

*Ground pipe preheating of ventilation air*  
4 PE-pipes, 160mm diameter, 35 - 40m length

#### Mechanical ventilation system

Supply air from the ground pipe is further tempered by heat recovered from the exhaust air via a counterflow heat exchanger.

#### Heating

Heat is distributed by the fresh air supply, heated with the heat exchanger and a central condensing gas furnace.

#### Solar thermal system

Solar collectors on the roof cover the domestic hot water demand with 60%. The Boiler contains 1000l.

#### Controls

The project is prevented from overheating by sensor-controlled sun shading.

### Energy performance<sup>1</sup>

<i>Space and ventilation heating</i>	10.8 kWh/m <sup>2</sup> a
Energy source:	
central condensing gas furnace	
- calculated-	
<i>Domestic hot water</i>	20.4 kWh/m <sup>2</sup> a
Energy source:	
solar thermal system 60%, gas furnace 40%	
- calculated-	
<i>Maximal heat capacity</i>	7.9 W/m <sup>2</sup>
<i>Pressurization test</i>	0.25 h <sup>-1</sup>
- monitored -	

1 All values refer to the Swiss Minergie-P calculations



### Planning tools

"Zertifizierungsheft"  
(Passivhausinstitut, [passivhaus@t-online.de](mailto:passivhaus@t-online.de))

### Innovative products

#### *Building envelope*

Windows: Plastic window system CMS SIGNUM,  
Kronenberger AG, [www.kronenberger.ch](http://www.kronenberger.ch)

Doors: Thermicum 68 (vacuum insulated), Brunegg  
AG / 5505 Brunegg, [www.brunex.ch](http://www.brunex.ch)

Exterior Walls: Insulation Neopor, Sarna Granol /  
6060 Sarnen, [www.sarna-granol.ch](http://www.sarna-granol.ch)

Walls cellar: Misapor (insulating concrete),  
Misapor AG / 7302 Landquart; [www.Misapor.ch](http://www.Misapor.ch)

#### *Ventilation and cooling*

Heat recovery unit: Type 7-Air, Habitus SHG 1.2,  
Gebr. Meyer AG / Luzern, [www.seven-air.ch/](http://www.seven-air.ch/)

#### *Domestic appliances*

Kitchen appliances: Elektrolux AG, [www.electrolux.ch](http://www.electrolux.ch)

#### *Space heating and DHW*

Solar: Solar combi boiler UFW/2, Ernst Schweizer  
AG/ Metallbau/ Bahnhofplatz 11/ CH-8908 Hedingen

### Contact person

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### Project team

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#### *Passivhaus calculations*

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Wyss Bauingenieure AG, Rothenburg

#### *Electrical engineering*

Andy Schmidiger, Emmenbrücke

#### *Heating ventilation sanitary planning*

Partnerplan AG Ing. Büro für Haustechnik und  
Energieberatungen, Littau, [info@partnerplan.ch](mailto:info@partnerplan.ch)

#### *Landscape architecture*

Dové plan AG, Luzern, [www.doveplan.ch](http://www.doveplan.ch)

#### *Sanitary planning*

Josef Roth, ing. Büro für Industrie- u. Haustechnik,  
Malters

### Literature and links

[www.konstanzrothenburg.ch](http://www.konstanzrothenburg.ch)