

Technical Data



Multiple Family Dwelling Sunny Woods - Building Integrated Photovoltaics



Project Data

Location	Zurich-Höngg, Switzerland
Date of Completion	October 2001
Type of Building	Multiple family dwelling
Type of Integration	Monopitch roof system built into the roof

Mounting System

Type	Self-fastening chromed steel clamps
Manufacturers	SunTechnics Fabrisolar AG

Modules

Type	Standard modules
Manufacturers	Unisolar
Number	504
Installed Power	16 kWp
Installed Area	300 m ²

Cells

Type	Amorphous thin film triple cells
Manufacturers	Unisolar

Inverters

Type	IG 30
Manufacturers	Fronius
Number	6

Project Participants

Building Contractor	Private
Operator	Private

Planning

Architecture	Architekturbüro Beat Kämpfen, Zurich, Switzerland
Photovoltaics	SunTechnics Fabrisolar AG, Küsnacht, Switzerland
Implementation	SunTechnics Fabrisolar AG, Küsnacht, Switzerland





Sun and Wood in Harmony

The “Sunny Woods” four-story multiple family dwelling in Zurich is an inspiring combination of functionality and aesthetics. It has an innovative form of wooden construction and is based on a standard of zero heating energy, so that it requires only 10% of the amount of energy normally needed by new buildings. “Sunny Woods” itself generates the electricity for the people living in it from the thin film photovoltaic system built into the roof. The innovative project was awarded the European Solar Prize 2002 and the Swiss Solar Prize 2002 for the best integrated roof system.

Building Concept

“Sunny Woods” is located on a sunny slope at the edge of the forest in the Höngg area of Zurich. The building is made up of three identical units, each with two maisonettes one above the other. It uses an optimized form of wooden construction and was largely prefabricated at the carpentry works. The load is borne by a special design technique that makes use of wooden blockboard panels that are only 35 mm thick, allowing an insulating layer of 330 mm to be used within a normal wall thickness. The purely wooden construction also blends harmoniously into the landscape and has an especially modern look. The house offers ample living space for six households and is largely autonomous due to the decentralized technology used for heat, water and ventilation. Through its high quality of living, “Sunny Woods” presents itself as a well thought out alternative for conventional detached houses.



Roof Structure

The slightly angled monopitch roof is made of folded metal with rock wool thermal insulation over the entire area. The entire roof area between the creases is covered with solar modules so that its surface forms a non-shaded level with the high point of the all-round creases. This elegant and architecturally futuristic combination is also suitable for trouble-free retrofitting onto existing seam roofs.

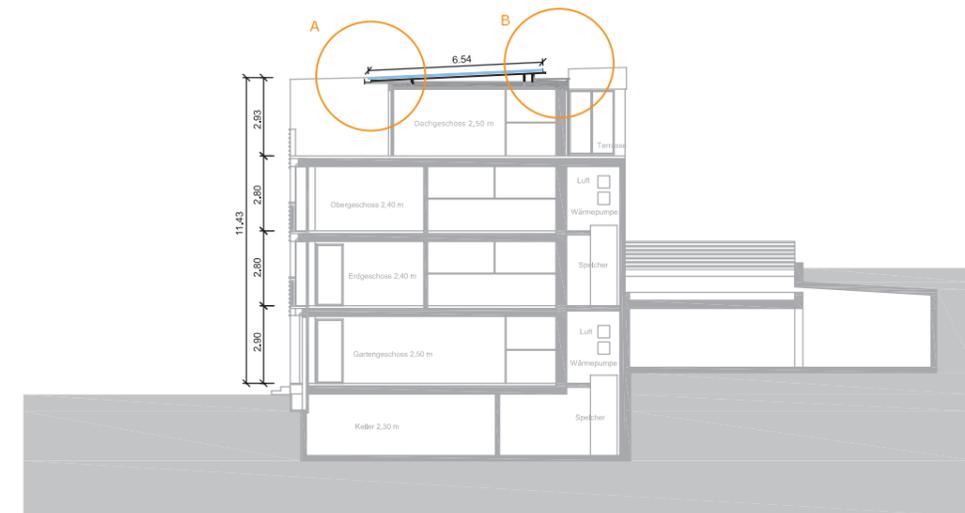


The roof skin is not penetrated, thanks to a specially developed fastening system. Self-fastening stainless steel clamps were snapped into the profile of the roof to attach the modules, which were installed directly on it. The clamps are constructed in such a way that fastening the module also earths the module and this provides perfect protection against lightning.

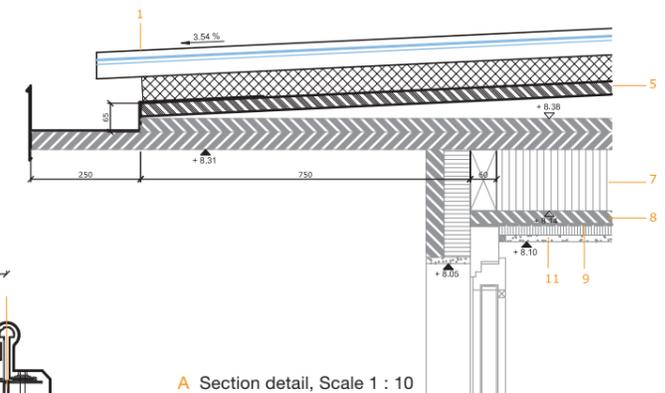
Photovoltaics

The solar power system that has been installed has been designed as a system for joint use, with each of the six apartments having its own share. The 504 solar modules on an area of around 300 m² produce electricity from the sun with a peak output of around 16 kWp. Thin film triple cells

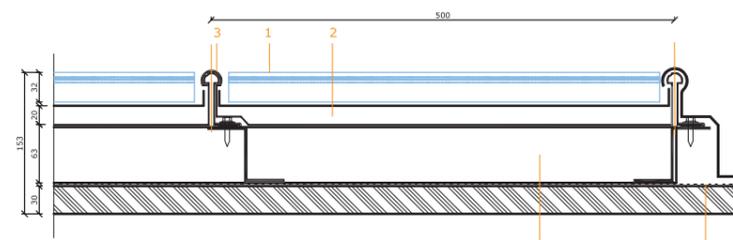
were used in the modules, which also have a thin circulation layer for ventilation at the back in the summer months to allow the cells to work optimally at high cell temperatures. Traditional crystalline modules lose up to 30% of their output capacity at the same temperatures. This is not the case with thin film triple cells: The amorphous material even increases the output capacity of the modules slightly when it is extremely hot. Thin film triple cells are laminated with Tefzel instead of glass. This plastic is extremely tough and can be compared with glass in all respects when it comes to weather resistance. The mechanical stability of the modules was achieved by applying laminated coated metal foils to the back. The solid frame is made of aluminium profiles that are screwed on the facing side.



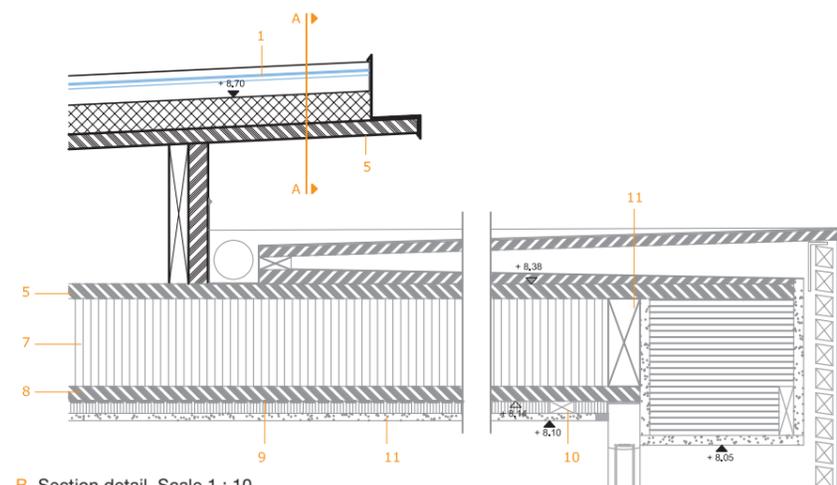
Cross section, Scale 1 : 200



A Section detail, Scale 1 : 10



A-A Roof construction vertical section, Scale 1 : 5



B Section detail, Scale 1 : 10

Legend

- 1 Photovoltaic module
- 2 Rear ventilation
- 3 Aluminium sheet roof
- 4 Rear ventilation 60 mm
- 5 Blockboard panel 30 mm
- 6 Blockboard rib 60/180mm
- 7 Insulation 60 mm
- 8 Blockboard panel 30 mm
- 9 Vapour barrier
- 10 Battens 24/48 mm
- 11 Plasterboard 15 mm