Glaserhaus - Affoltern im Emmental, Switzerland

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Roof-integrated Photovoltaic System

Solar

What is the solution?

On the roof of the special craftsmen's house, which is a listed building, a fully integrated photovoltaic system was installed. The modules take over the function of the water-bearing layer, therefore it is an in-roof system. The two large roof pitches facing east and west have been covered, the small one facing south but not the one facing north. The frameless modules of the Swiss company Meyer Burger were used. In order to be able to actively cover the edges of the roof, so-called "Crea modules" from Meyer Burger (made to measure) were also added. In order to maintain a homogenous black appearance of the roof surface, solar-look printed single-pane safety glass was used on the northern mitre sign. The project was awarded with the swiss solar price 2016.

Why does the solution work in terms of compatibility with conservation and technical aspects?

From a technical point of view, the building is solidly stabilised and energetically brought up to the latest standards. The building is partially protected. The southern elevation of the building is under protection. The building built in 1965 was completely renovated in 2015 to Minergie-P standards. The only exception is the traditional southern façade which has not been specifically isolated due to the regulation of historical monuments. Insulating glasses were used, inserted in the windows of original size, reusing the glass on the façade for the internal windows, and recovering others valuable elements of the building, such as the "braided" arches and wooden bracing boards. The photovoltaic system in the roof of the building uses selected and highly efficient Meyer Burger MegaSlate II solar cells, with tailor-

made modules to improve integration and adapt to the complex shape of the hipped roof.

Description of the context:

Former farmhouse, core of 1765/66, so-called "glazier or doctor house", renovation of 1888. Impressive stand/beam construction under a quarter hipped roof, rising from the vaulted cellar from 1766. The shingle-covered building, whose present appearance is mainly due to the 1888 alteration, has a high, 3-storey, well-windowed front crowned by a roundabout. The eaves-sided upper floor arcades are closed. Contoured woods (braided bows); distinguished grey frame. Gabled building with an extraordinary volumetry. The aim of the project and the associated construction measures is to repair the existing and restore the original condition. The floor plans will be spatially and functionally separated, with the aim of consistently uncovering the core building from 1765 on all floors. This restoration is connected with the aim of preserving the overall appearance of the building, repairing the roof, facades and surroundings and carefully restoring the prestigious south facade.

Pros and cons of the solution:

Integrated BIPV solution that covers the whole complex pitched roof, with careful reflection materials, colour and panel shape, along with the way they are positioned, aligned and anchored. Maximum surface extension of the BIPV plant to improve overall energy efficiency of the building. The arrangement of solar panels on triangular pitched roofs approaches solves the critical points with tailored solar modules with attention to detail and fixing systems. Consequently, panel-laying may be compatible, if geometrically adaptable shaped panels are employed, as “laser cut” or "dummies" solar modules. Selected and highly efficient solar cells were used.

Type of data available (level of information, simulation):

The project PlusEnergieBau renovation Anliker, Affoltern iE was awarded with the Swiss Solar and the European Solar Prize in 2016.

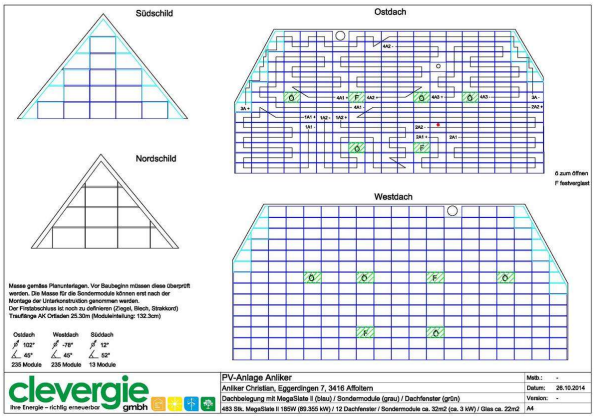
Additional information about the solution:

Climatic zone Cfb (Warm temperature, fully humid, warm summer)

Are there any related publications or pictures of the solution?

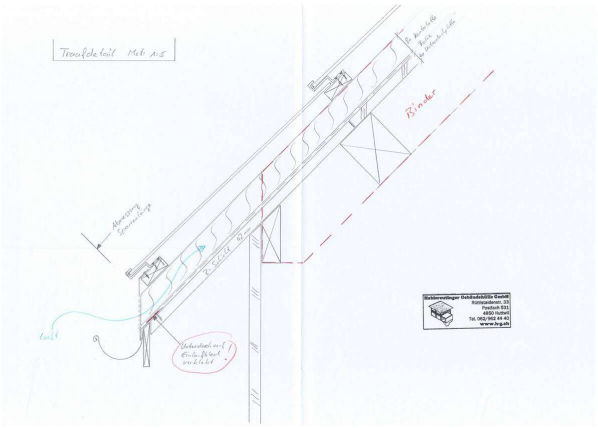
Before interventions © C. Anliker

Photovoltaic roof © C. Heilig



Photovoltaic roof plan © Clevergie

Detail new roof © C. Martig



Construction detail PV system © C. Anliker

https://www.hiberatlas.com/smartedit/projects/234/clevergie_Affoltern_MegaSlate_3.p

Nachhaltig Bauen, 2-2016 (German)

https://www.hiberatlas.com/smartedit/projects/234/g-16-09-21_peb_sanierung_anliker_affoltern_def[1]_3.pdf

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